Medical Sciences Campus

University of Puerto Rico

Catalog 2025 - 2026

UNIVERSITY OF PUERTO RICO ♦ MEDICAL SCIENCES CAMPUS
DEANSHIP OF ACADEMIC AFFAIRS
CATALOG 2025-2026

Myrna L. Quiñones Feliciano, MD, JD
Chancellor

Yasmín Pedrogo Rodríguez, MD, FAAP, MSc MEdL
Dean of Academic Affairs

Wanda I. Colón Ramírez, PhD, MS, OTR/L
Associate Dean of Academic Affairs

P.O. Box 365067, San Juan, Puerto Rico 00936-5067
Paseo Dr. José Celso Barbosa, Centro Médico de PR, Río Piedras, PR 00921
787-758-2525 ● www.rcm.upr.edu

Revised on January 9, 2026.

The Medical Sciences Campus holds a Postsecondary Institutions Board Renewal License (#2023-116) and is accredited by the MSCHE (Middle States Commission on Higher Education). In addition, it does not discriminate based on race, religion, sex, nationality, age, origin or social or economic condition, physical or mental disability, or political affiliation.

DISCLAIMER

The Medical Sciences Campus of the University of Puerto Rico is an Equal Employment Opportunity Employer. The institution does not discriminate in its academic offerings based on sex, race, color, age, national origin, political or religious beliefs, gender, gender identity or expression, pregnancy, civil status, sexual orientation, ethnic origin, or being perceived as a victim of domestic violence, sexual assault, sexual harassment, or stalking.

The curricula at the Medical Sciences Campus are dynamic and are systematucally revised to meet the educational needs of students and to incorporate new trends and advances in various disciplines. These revisions follow the guidelines of accrediting bodies. Curricular updates are ongoing, and all programs are subject to change, termination, or relocation within the system.

Prospective students are encouraged to contact the Office of the Dean or the director of their program of interest to receive the most current information. The information in this catalog does not constitute a contract, either express or implied, between any applicant, student, or faculty member and the Medical Sciences Campus or the University of Puerto Rico System. Students are responsible for obtaining updated information and for meeting all the requirements of their program at the Medical Sciences Campus.

The Medical Sciences Campus reserves the right to make changes to admission requirements, registration, tuition and fees, calendar, curricula, attendance, conduct, academic standing, promotion, and graduation.

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GOVERNANCE

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María J. Crespo Bellido, Representative of the Academic Senate
America Facundo , Representative of the Academic Senate
Valeria Miranda Bravo, Student Representative
Melissa Reyes Pérez, Interim Director, Legal Office
Gerardo Hernández Pererira , Interim Director, Human Resources
Ivy Class Guzmán, Budget Director
Sonnya I. Ramos Zeno, Chancellor Executive Assistant
Raúl Rivera González, Executive Secretary

Medical Sciences Campus, Academic Senate
Zayira Jordán Conde, President, University of Puerto Rico, ex-officio
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Yasmín Pedrogo Rodríguez, Dean of Academic Affairs, ex-officio
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Sherily Pereira Morales, Interim Dean, School of Nursing, ex-officio
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Valeria Miranda Bravo, Student Representative before the Administrative Board, ex-officio
Juan José De Jesús Oquendo, Student Representative before the University Board, ex-officio
José R. Rosa Martínez,President, General Student Council, ex-officio
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Jennifer R. Guzmán Badillo, Faculty Ombudsman
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Senator Nelson Escobales, School of Medicine, Basic sciences
Senator José G. Ortiz, School of Medicine, Basic sciences
Senator Ana Espino, School of Medicine, Basic sciences
Senator Pablo E. Vivas, School of Medicine, Basic sciences
Senator Melvin Bonilla, School of Medicine, Clinical sciences
Senator América Facundo, School of Medicine, Clinical sciences
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Senator Horacio Serrano, School of Medicine, Clinical sciences
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Vacant, School of Medicine, Clinical sciences
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Senator Evangelina Morou, School of Dental Medicine
Senator Grace Pagán, School of Dental Medicine
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Vacant, Student Representative, School of Health Professions
Senator Nicole M. Díaz, Student Representative, School of Nursing
Senator Ángel G. Rodríguez, Student Representative, School of Pharmacy
Senator Gerardo Caussade, Student Representative, School of Medicine
Senator Lorivette Ortiz Valentín, Student Representative, Biomedical Sciences
Senator Diana Y. Silva, Student Representative, School of Dental Medicine
Senator Isaury Sánchez, Student Representative, Faculty of Biosocial Sciences and Graduate School of Public Health
Raúl Rivera González, Executive Secretary

GENERAL INFORMATION

The University of Puerto Rico

The University of Puerto Rico is a multiunit, state supported, university system consisting of eleven campuses: Río Piedras, Mayagüez, Medical Sciences, Cayey, Humacao, Aguadilla, Arecibo, Bayamón, Carolina, Ponce, and Utuado. It is a co-educational university system offering graduate, first professional, five, four, and two-year programs. (Webpage: www.upr.edu)

The Governing Board

This Board is the governing body of the University of Puerto Rico. It is composed of fourteen (14 members that include: one (1) undergraduate student, one (1) graduate student, two (2) tenured faculty members, the Secretary of Education (ex-officio), one (1) experienced professional in the field of finance, one (1) Puerto Rico resident who has had a distinguished participation in community affairs, five (5) Puerto Rico residents with outstanding careers in the arts, sciences, and professional fields, the Executive director of the Puerto Rico Fiscal Agency and Financial Advisory Authority (1), and one (1) Puerto Rico resident with strong ties with Puerto Rican communities outside the island. The Governing Board is charged by law with the responsibility of authorizing the creation or reorganization of university units, approving the institution's budget, approving or amending university bylaws, and overseeing the overall functioning of the institution. The governor with the consent of the Legislative Branch appoints all members, except the two students and two faculty members, for terms specified in the University Law. (Webpage: https://juntagobierno.upr.edu/)

University President

The President is the chief executive officer and official representative of the University System. He/she is appointed by the Governing Board for an indefinite term. With the collaboration of the University Board, the President coordinates and supervises all university activities and takes actions to promote the development of the institution. He/she presides over the University Board and is an ex-officio member of the academic senates and administrative boards of the eleven university campuses. The President, with the advice of the University Board, submits a plan to the Governing Board for the comprehensive development of the University based on projects and recommendations, which originate at the institutional units. He/she also prepares a comprehensive budget for the University System based on the budget proposals submitted by the chancellors and approved by the administrative boards of the campuses.

The President submits to the Governing Board the appointment of the chancellors of the institutional units, the financial officers, and other appointments, which require confirmation by the Governing Board.

University Board

The University Board is composed of the University President, who presides it, the chancellors of all system units, the Director of Finance, three additional officials appointed by the President with the approval of the Governing Board, a representative elected by each academic senate, and six student representatives. The Board's essential functions are to integrate the University System's planning and to advise the President as to the coordination of the various institutional units in their academic, administrative, and financial matters.

The University Board prepares the General Student Bylaws and submits the document to the Governing Board for final approval. It considers the comprehensive development plan and the budget proposal for the University System presented by the President, which are then submitted to the Governing Board for their approval.

MSC Chancellor

The Chancellor is who exercises administrative and academic authority according to the provisions of the University Law and other university regulations heads each campus. The President of the University nominates a chancellor of each campus after consulting with the corresponding Academic Senate. The appointment is then submitted for consideration by the Governing Board. The chancellor presides over the Academic Senate, the Administrative Board, and faculty meetings. He/she prepares the budget proposal, which is submitted to the President and the University Board upon approval by the Administrative Board of the campus.

MSC Administrative Board

Each campus has an Administrative Board composed of the Chancellor, who presides it, the deans, a student representative, and two senators elected from among the elected members of the Academic Senate. The Administrative Board is an advisory body to the Chancellor. It oversees administrative matters, including budget proposals submitted by the Chancellor. At the request of the Chancellor, the board grants leaves, academic rank, tenure, and promotions to academic personnel according to the *University Bylaws*.

MSC Academic Senate

All university campuses have an Academic Senate composed of the Chancellor, who presides it, the deans (ex-officio), the Director of the Library (ex-officio), representatives elected by each faculty from among its tenured members, including librarians, counselors, social workers, and psychologists, and students. The student body elects student senators. The Senate constitutes the official forum of the academic community for the discussion of issues pertaining to many aspects of institutional life.

The Academic Senate establishes academic policy and general guidelines for appointment, tenure, promotion, and leaves of absence of faculty members. They elect their representatives to the University and Administrative Boards and make recommendations to the Governing Board as to the creation or reorganization of colleges, schools, and units, appointment of chancellors and deans, and evaluate and recommend proposals for the creation of new academic programs. In addition, they submit student bylaws to the University Board and establish general rules regarding campus or institutional matters, which involve common responsibilities.

The Medical Sciences Campus

History

In 1904, the Government of Puerto Rico created the Anemia Commission in response to a pressing health problem in the island. Dr. Bailey K. Ashford and others pioneered in the mass treatment of hookworm disease, establishing the grounds for the Institute of Tropical Medicine, which began operations in 1912. In 1926, under the auspices of Columbia University, the Institute became the School of Tropical Medicine of the University of Puerto Rico. A specially designed and equipped building for research and teaching was erected next to the Capitol Building in Old San Juan. The School offered programs in the areas of medical technology, health education, public health, nursing, and sanitation, and soon became a renowned center for research and teaching.

The agreement between the University of Puerto Rico and Columbia University was terminated by mutual consent in 1948. The following year, the Legislature of Puerto Rico authorized the establishment of the School of Medicine. The new school admitted its first class in August 1950 and was accredited in the spring of 1954 by the Liaison Committee on Medical Education. The first forty-five (45) Doctor of Medicine degrees were awarded in June of that year. In 1953, the San Juan City Hospital became the main clinical setting. The Department of Preventive Medicine was part of the School since its inception. It offered programs in the field of public health,

physical therapy and occupational therapy. It was in 1957 when the fisrt physical and occupational therapy class participated of the UPR graduation. The long tradition of research and teaching in this area initiated at the School of Tropical Medicine.

On June 21, 1956, the Legislature appropriated funds for the establishment of a school of dentistry. The new School of Dentistry (now School of Dental Medicine) enrolled its first class of twenty-nine (29) students in August 1957 in a program leading to the degree of Doctor of Dental Medicine. In 1960, a Department of Health hospital facility located on the grounds of today's Medical Center became the main clinical setting for the School of Medicine and was renamed the University District Hospital. The clinical faculty of the School of Medicine moved to the hospital while the Basic Sciences faculty and the School of Dentistry remained at the original building in Old San Juan.

In the area of basic sciences, the Council on Higher Education of the University of Puerto Rico approved the establishment of graduate education programs leading to the degrees of Master of Science and Doctor of Philosophy in Anatomy, Biochemistry and Nutrition, Medical Zoology, Microbiology, and Physiology. In 1964, the Pharmacology and Toxicology Graduate Program was added. During the 1960s and 1970s, the School of Medicine established and expanded residency programs in the clinical specialties. The School of Dentistry created postgraduate programs in Pedodontics and Oral Surgery. Programs in Dental Assisting and Dental Hygiene were also added. Other programs offered during that period by the Department of Preventive Medicine were Cytotechnology, Demography, Health Services Administration, Radiologic Technology, Medical Records, and bachelor and master's degree programs in Nursing.

The Medical Sciences Campus became a campus because of the organizational reform of the University of Puerto Rico, as stated in the University Law of January 20, 1966. Previously, the School of Medicine and the School of Dentistry had deans who reported directly to the Chancellor of the University. Both units operated autonomously with funds assigned directly by the Legislature. Their faculties had no representation in the Academic Senate or the University Board.

The establishment of the Medical Sciences Campus involved the appointment of a chancellor for the campus, the centralization of administrative procedures (formerly under the School of Medicine), and the establishment of a contract between the Chancellor of the Medical Sciences Campus and the Secretary of Health for the use of the University District Hospital and facilities of the Puerto Rico Medical Center. In addition, the Chancellor of the Medical Sciences Campus was appointed the official representative of the University in the Board of Directors of the Puerto Rico Medical Center. The Schools of Medicine and Dentistry, the Physical Therapy, Occupational Therapy and Speech Pathology programs, and the Biomedical Sciences graduate programs were organized as units under the new Chancellor. In 1970, the Department of Preventive Medicine of the School of Medicine became the Graduate School of Public Health under the direction of a dean. In 1971, the Deanship for Student Affairs was established.

In 1972, the Medical Sciences Campus administrative offices and the basic sciences departments, previously located at the School of Tropical Medicine building in Old San Juan, moved to new facilities at the Puerto Rico Medical Center, joining the clinical departments operating at the University District Hospital since 1960. Offices and research laboratories were provided for the basic sciences and clinical faculties in the main building of the campus, which is adjacent to the University District Hospital and to other buildings of the Puerto Rico Medical Center.

The Campus underwent an internal reorganization approved by the Council on Higher Education on February 13, 1976, effective July 1, 1976. This reorganization included: the creation of the Deanship for Academic Affairs and the Deanship of Administration, the establishment of the College of Health Related Professions (now School of Health Professions) under which all the technical and professional allied health programs were

grouped, the reorganization of the School of Public Health as the Faculty of Biosocial Sciences and Graduate School of Public Health, and the creation of the Division of Biomedical Sciences of the School of Medicine.

In 1977, the School of Pharmacy, established in 1913, moved from the Río Piedras Campus to the Medical Sciences Campus. Additional buildings were constructed or remodeled to house the School of Pharmacy and the College of Health Related Professions, which at that time included the School of Nursing. With the addition of the School of Pharmacy, the Medical Sciences Campus truly united the major health professions programs offered by the University of Puerto Rico System. The location of the five schools near the Puerto Rico Medical Center facilitated clinical practice and fostered life as a health sciences campus.

As the institution entered the eighties, planning and development activities were given high priority and were sustained throughout the decade. A Comprehensive Development Plan and a Campus Mission Statement issued in 1984 were followed by strategic plans at the school and campus level, as well as by a revised mission statement in 1986 and subsequently in 1994. In 1995, the School of Nursing, until then part of the College of Health Related Professions, became an administratively separate unit and the sixth campus school.

Growth as a campus is also evidenced in the institution's programmatic areas of teaching, research, and service. In the eighties and nineties, new academic programs were added in response to identified health labor needs. Among them, Master of Science programs in Epidemiology, Pharmacy, Clinical Laboratory, and Industrial Hygiene, as well as Master of Public Health program with specialty in Gerontology. Other Master of Public Health specialties were later added and a Doctor of Public Health program enrolled its first class in 1998. Other degree programs include a Doctor of Pharmacy degree first offered in August 2001, the Doctor of Audiology degree, which admitted its first class in August 2007, and a Doctor of Nursing Science, which began in 2012. In addition, the Doctor of Physical Therapy degree began in 2014, the Professional Studies Certification in Maternal and Child Health (Online) began in August 2019, the Doctor of Philosophy in Pharmaceutical Sciences (PhD) began in 2021, the Doctor in Nursing Practice with Specialty in Anesthesia (DNP-SA) began in 2022, and the Doctor of Philosophy in Nursing (PhD) began in 2023.

Mission, Vision, and Values of the Medical Sciences Campus

Mission

Train professionals in the health sciences through academic offerings at various levels, emphasizing the development of research that generates new scientific knowledge and the provision of services framed within ethical standards and institutional values that contribute to accessibility and well-being of the population, with a focus on the sectors of greatest need in society.

Vision

Leading academic institution renowned globally, with the highest level of development in teaching, investigation and service as well as the transformation of healthcare for society.

Values

Excellence: The essence of academic life whose indicators of performance and satisfaction go beyond the ordinary and establish the ability to perform roles remarkably.

Integrity: Commitment to be honest and adhere to values, by systematically making the best decisions to do what is right while for social wellbeing.

Respect: Base for achieving a harmonious social interaction through acknowledgment, appreciation and validation of the rights of others, as well as self-valorization.

Social responsibility: Commitment and duty of the members of the university community to voluntarily contribute to social wellbeing.

Professionalism: Behaviors, attitudes and abilities demonstrated, governed by the rules established for performing any role.

Ethics: Critical reflection that makes every person focus their behavior according to the moral rules established.

Culture of Innovation: Action for change focused on modifying existing things to improve or create something new.

Organization

The Medical Sciences Campus is composed of the School of Medicine, the School of Dental Medicine, the Faculty of Biosocial Sciences and Graduate School of Public Health, the School of Pharmacy, the School of Health Professions, and the School of Nursing. Four support deanships, Academic Affairs, Student Affairs, Investigation and Administration, assist the Chancellor and the schools in daily operations.

The Chancellor is the chief executive officer at the Medical Sciences Campus. He/she coordinates the various administrative structures common to all academic units, promotes, and directs academic planning for the comprehensive development of the institution. The Chancellor represents the Medical Sciences Campus at institutional bodies and the community at large, and is assisted by the Academic Senate on academic affairs, and by the Administrative Board on administrative matters.

A dean who represents it at the Administrative Board and who is an ex officio member of the Academic Senate heads each school and deanship. Academic senators elected by each faculty represent the schools in the Academic Senate. There are also two faculty representatives to the Administrative Board elected from among the academic senators.

Deanship of Academic Affairs

The Deanship of Academic Affairs of the Medical Sciences Campus was established in 1976 as part of a campus reorganization. The Deanship is responsible for overseeing and coordinating academic processes across all schools, including the development of new academic programs, curricular revisions, continuing education, faculty development, accreditation processes, and the coordination of interdisciplinary activities.

The Deanship of Academic Affairs includes academic support offices, service-oriented units, and research facilities and programs. The academic units are as follows: the Office of the Dean and Associate Dean, the Teaching and Research Assistantship Program, the Office of Academic Development, the Registrar's Office, the Central Division of Continuing Education and Professional Studies, the Office of Research, Planning and Institutional Assessment, the Conrado F. Asenjo Library, the Center for Technological Support in Academia, the AIDS Education and Training Center (AETC Program), the RCM Online Division, Accreditation and Licensure, the Puerto Rico Health Sciences Journal (PRHSJ), the Women and Health Center, the Institute of Bioethics Eugenio María de Hostos, the Research Center in Minority Institutions Program (RCMI Program), the Behavioral Sciences Research Institute, the Institute of Neurobiology, and the Title V Project.

Faculty of the Dean of Academic Affairs

Central Division of Continuing Education and Professional Studies

MORALES-MONTALVO, IVONNE – *Assistant Professor;* MS, 1980, University of Puerto Rico – Río Piedras Campus.

Office of Academic Development

ESTREMERA-DE JESÚS, LUIS E. – *Assistant Professor*, EdD, 2020, University of Puerto Rico – Río Piedras Campus.
PRÍNCIPE-PABELLÓN, BRUNILDA - *Assistant Professor*, DrPH, 2023 - University of Puerto Rico - Medical Sciences Campus.

Office of Institutional Research, Planning and Assessment

BARRETO-VELÁZQUEZ, WANDA - *Investigator*; EdD, 2007, Interamerican University of Puerto Rico.
QUINTERO-VÉLEZ, MARÍA - *Associate Investigator*; DrPH, 2023, University of Puerto Rico - Medical Sciences Campus.

Women and Health Center

PACHECO-ACOSTA, EDNA E. – *Assistant Investigator*; DrPh, 2016, University of Puerto Rico - Medical Sciences Campus.

Behavioral Sciences Research Institute

BERRIOS TORREZ, IOANNISELY – Adjunct Professor, MA, 2016, Baylor University, Texas.
CHAVEZ-RODRIGUEZ, LIGIA M. - *Associate Professor*, PhD, 1995, Tulane University.
SANTIAGO BATISTA, KATYANA M. – *Adjunct Professor*; MS, 2011, University of Puerto Rico - Medical Sciences Campus.
SAUMELL TIVERA, JANET T. – Adjunct Professor; MIS, 2019, University of Puerto Rico – Río Piedras Campus.
VALE LASSALLE, KEYLIN M. - *Adjunct Professor*, MS, 2018, University of Puerto Rico - Medical Sciences Campus

Graduate-Research Initiative for Scientific Enhancement (G-RISE Program)

VILA RIVERA, DORYLIZ – *Assistant Professor*; MS, 2001, University of Puerto Rico - Medical Sciences Campus

Research Centers in Minority Institutions Program (RCMI Program)

GUZZI VASQUES, ANA GUZZI – *Adjunct Professor*; PhD, 2013, University of Brasilia, Brazil.
LAFARGA PREVIDI, IRENE – *Adjunct Professor*; PhD, 2013, University of Puerto Rico – Rio Piedras Campus.
ROCHE LIMA, ABIEL – *Associate Professor*; PhD, 2015, University of Manitoba – Canada.
VARGAS FRANCO, DORIANMARIE – *Adjunct Professor*; PhD, 2019, University of Florida – Gainesville.

Institute of Neurobiology

BLAGBURN-PERRYMAN, JONATHAN M. - *Investigator*; PhD, 1982, Thames Polytechnic - United Kingdom.
COLÓN-RAMOS, DANIEL A. - *Adjunct Professor*; PhD, 2003, Duke University Medical School – North Carolina.
GIRAY, TUGRUL – Adjunct Professor; PhD, 1997, University of Illinois at Urbana-Champaign – Illinois.
HAMPEL, STEFANIE – Adjunct Professor; PhD, 2007, University of Würzburg, Germany.
KUFFLER-SHEWCROFT, DAMIEN P. - *Professor*; PhD, 1975, University of California - California.
LASALDE-DOMINICCI, JOSÉ A. - *Adjunct Professor*; PhD, 1988, University of Puerto Rico - Río Piedras Campus.

LIZARDI-ORTIZ, JOSÉ E. – Adjunct Professor; PhD, 2008, University of Puerto Rico – Río Piedras Campus.
MARIE-BORDES, BRUNO - *Associate Investigator*; PhD, 1999, University of Sussex, Brighton, United Kingdom.
ROSA-MOLINAR, EDUARDO - *Adjunct Professor;* PhD, 1997, University of Nebraska, Medical Center.
SEEDS, ANDREW M. – *Assistant Professor*, PhD, 2005, Duke University – North Carolina.
VELÁZQUEZ-MARRERO, CRISTINA M. – *Assistant Investigator*, PhD, 2008, University of Massachusetts Medical School – Massachusetts.

Title V Project

DE JESÚS OJEDA, LIZBELLE – *Adjunct Professor*, EdD, 2020, NOVA Southeastern University, Florida US.

Licensing and Accreditation

The Medical Sciences Campus operates as a higher education institution licensed and authorized by the Post Secondary Institutions Board (JIPs) of the Puerto Rico State Department, in accordance with Certification No. 2023-116 and is accredited as a campus by the Middle States Commission on Higher Education (MSCHE).

The Middle States Commission on Higher Education (MSCHE) has accredited the campus continuously since 1949. The last accreditation reaffirmed was in the 2022 and next Self-Study Evaluation will be during the 2028-2029. Middle States Commission on Higher Education, 3624 Market Street, Philadelphia, PA 19104. Telephone: (267) 284-5000, E-mail: info@msche.org. Accreditation actions are available at https://www.msche.org/institution/0617/.

In addition, schools and programs hold accreditation by the accrediting bodies in their fields:

1. Liaison Committee on Medical Education (LCME)
2. Commission on Dental Accreditation (CODA) of the American Dental Association (ADA)
3. Accreditation Council for Pharmacy Education (ACPE)
4. Commission on Collegiate Nursing Education (CCNE)
5. Council on Accreditation of Nurse Anesthesia Educational Programs (COA)
6. Council on Education for Public Health (CEPH)
7. International Council of Accreditation (ICA) for Allied Ophthalmic Education Programs
8. Joint Review Committee on Education in Radiologic Technology (JRCERT)
9. National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)
10. Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT)
11. Committee on Veterinary Technician Education Activities (CVTEA) of the American Veterinary Medical Association (AVMA)
12. Commission on Accreditation of Allied Health Education Programs (CAAHEP) Cytotechnology Programs Review Committee (CPRC)
13. Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics (AND)
14. Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA)
15. Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM)
16. Council on Academic Accreditation in Audiology and Speech-Language Pathology (CAA) of the American Speech-Language-Hearing Association (ASHA)
17. Commission on Accreditation in Physical Therapy Education (CAPTE) of the American Physical Therapy Association (APTA)
18. Council on Education for Public Health (CEPH)

19. Commission on Accreditation of Healthcare Management Education (CAHME)
20. Accreditation Council for Graduate Medical Education (ACGME)
21. American Society of Health-Systems Pharmacists (ASHP)

Conrado F. Asenjo Library (CFAL)

The **Conrado F. Asenjo Library (CFAL)** is the leading health sciences information resource center in Puerto Rico and one of the most comprehensive of its kind in the Caribbean. Occupying five floors of a six-story structure built in 1972, the Library houses a distinguished collection whose origins date back to the **Institute of Tropical Medicine (1912)** and the **University of Puerto Rico School of Tropical Medicine**, developed in collaboration with Columbia University (1926–1949). Today, CFAL continues this legacy by supporting all academic programs of the Medical Sciences Campus with **thousands of resources across multiple formats**, serving as a cornerstone for education, research, and clinical practice in the health sciences.

Collections at a Glance

- **1,675 active journal subscriptions** (134 print, 1,541 e-journals).
- **60,123 full-text electronic periodicals** (journals, magazines, etc.) from ClinicalKey, EBSCOhost, InfoTrac, OVID, and ProQuest.
- **46,152 print books and 2,495 e-books** (ClinicalKey, OVID, and OVID Español).
- **2,298 full-text e-books** from databases and leading health organizations (IOM, NAP, WHO, World Bank, etc.).
- **2.2 million+ theses and dissertations,** including 2,900 from the MSC, 2 million from ProQuest, and 216,705 in Spanish from DialnetPlus.
- **1,468 institutional multimedia resources** in physical format.
- **171,432 film titles** (103,432 via Films on Demand; 68,000 from Dental Education in Video).

Note: Available resources are subject to change as vendor contracts are renewed, and new products are tested. For the most up-to-date listing, visit our website at https://www.upr.edu/biblioteca-rcm/.

Study Spaces and Hours

While the Conrado F. Asenjo Library's regular service hours are **Monday through Friday, 7:00 a.m. to 6:00 p.m.**, students and researchers benefit from extended access to modern and flexible study facilities.

The Library provides a **24/7 study area** on the first two floors, offering seating for **260 users** in a variety of settings, including tables, individual study carrels, and tablet chairs. This area also features:

- **Four group study rooms** with interactive digital screens, mobile tables and chairs, portable boards, and Internet access.
- **Two charging stations** for recharging mobile devices.

On the **fourth floor**, there are **seven additional group study rooms**, each equipped with interactive digital screens, portable boards, mobile tables and chairs, and Internet connectivity. These rooms are available **Monday through Friday, from 7:00 a.m. to 10:00 p.m.**

The **sixth floor** offers **two multi-use rooms**, each accommodating up to **15 people**. Fully equipped with large digital screens, mobile tables and chairs, and Internet access, these rooms can also be combined into a **single larger space**, ideal for group study, workshops, and academic activities.

Services and Access

The **Conrado F. Asenjo Library** offers a wide range of services to support students, faculty, researchers, and health professionals in their academic and clinical work. Users may borrow **print materials** during regular service hours, Monday through Friday from 7:00 a.m. to 6:00 p.m. They also benefit from **wireless access** across campus using their institutional accounts, with the option of **remote access** through OpenAthens.

The Library provides **reference services** both in person and virtually. In-person assistance is available Monday through Friday, from 8:00 a.m. to 6:00 p.m., while the **Virtual Reference Librarian Service** offers support 24/7 via the Library's website and email.

To strengthen research and academic skills, librarians offer **in-person and online workshops** on topics such as database searching, evidence-based practice, plagiarism prevention, citation styles (APA, AMA, NLM, Vancouver, among others), the use of bibliographic managers (Mendeley, EndNote, etc.), and the preparation of annotated bibliographies. These workshops can be scheduled in collaboration with faculty or at the request of students.
In addition, the Library provides access to **44 LibGuides** covering diverse topics in the health sciences, including APA, the All of Us Researcher Workbench, Bioethics, ClinicalKey, Nursing Theorists, PubMed, and many others.

Special Collections

The **Special Collections Section** of the Conrado F. Asenjo Library traces its origins to the historic School of Tropical Medicine and today serves as a vital center for preserving Puerto Rico's academic and cultural heritage in the health sciences. Its mission is to **organize, preserve, acquire, and disseminate information on health in Puerto Rico**, supporting teaching, learning, and research, while aspiring to be the island's leading historical health sciences research center.

The holdings encompass a wide variety of unique resources: books, government reports, local and international journals, agency brochures, press clippings, faculty reprints, theses dating back to the 1940s, manuscripts from the Spanish–U.S. sovereignty transition, and significant historical artifacts. The section is organized into **five main areas**:

- **Puerto Rican Collection (CPR):** The most extensive health sciences collection on the island, featuring books, journals, photographs, reports, theses, furniture, and rare works such as Médico botánico criollo (1864) and the 1899 Census.
- **History of Medicine Collection:** Resources on tropical diseases and medical history from the 19th and early 20th centuries, including busts of Pasteur, Ramón y Cajal, and Ashford, and a rare 1595 Latin dentistry text.
- **Bailey K. Ashford Archive:** Over 100 linear feet of manuscripts, photographs, and memorabilia documenting the legacy of Dr. Ashford and subsequent family donations.
- **Historical Journals:** Approximately 153,000 volumes and 345 titles (1832–1990), covering disciplines from bacteriology and immunology to nursing and pharmacy.
- **Institutional Archive:** Records of the Medical Sciences Campus since its creation in 1966, including senate minutes, administrative files, annual reports, and accreditation documents.

Special Collections also manage **Libraria**, a digital repository that provides online access to primary sources on Puerto Rican health history, extending the reach of these unique materials to the academic community and beyond.

Partnerships and Networks

CFAL is a proud member of the **National Network of Libraries of Medicine (NN/LM), CONBLS**, the **Medical Library Association (MLA),** and the **Association of Academic Health Sciences Libraries (AAHSL)**. It is also the hub of the **Virtual Health Library Puerto Rico (BIREME–PAHO–WHO)**, providing open access to health publications from Puerto Rico's public and private sectors.

Interlibrary Loan Service

The **Conrado F. Asenjo Library** provides access to biomedical literature through its **Interlibrary Loan** (**ILL**) **Service**, supporting students, faculty, researchers, and health professionals who require materials beyond our local collections. As a **Resource Library of the National Library of Medicine (NLM)**, CFAL participates in the **NLM Interlibrary Loan (ILL) Program** and the **DOCLINE system** (www.docline.gov), an automated routing platform developed by NLM that facilitates the lending and borrowing of biomedical literature among U.S. and international libraries.

Through this service, users can request journal articles, books, and other resources not available locally. In addition, the NLM offers free access to a wide range of biomedical literature, including books, journals, and databases (Free Biomedical Literature Resources).

By connecting with the NLM and the DOCLINE community, the Conrado F. Asenjo Library ensures that the health sciences community in Puerto Rico has access to the most extensive biomedical resources available worldwide, strengthening both local research and international collaboration.

Accreditation and Institutional Role

The Library plays a central role in supporting the institutional and strategic goals of the Medical Sciences Campus (MSC) and the University of Puerto Rico (UPR). It contributes to the continuous assessment and reporting required by the MSC's strategic plan and complies with standards set by more than 20 health-related accrediting agencies, ensuring alignment with educational excellence.

Faculty

BARRIOS-LLORENS, ROSSANA - *Librarian II*, MIS, 2004, University of Puerto Rico - Río Piedras Campus.
DEL VALLE-LÓPEZ, PEDRO A. - *Librarian III*, MLS, 1996; University of Puerto Rico - Río Piedras Campus.
FLORES-RIVERA, EFRAÍN - *Librarian IV*, *EdD, 2015,* University of Puerto Rico - Rio Piedras Campus.
RAMOS LLERA, DANILLY – Librarian I, EdD, 2016, NOVA Southeastern University, Florida US.
SEGUÍ-CABALLERO, CHARLES - *Librarian II*, MLS, 2004, University of Puerto Rico - Río Piedras Campus.
UBIETA SANTIAGO, JOSE R. – *Librarian I*, MIS, 2012, University of Puerto Rico - Rio Piedras Campus.

ADMISSIONS, REGISTRATION, AND GRADUATION PROCEDURES

Admissions

The Medical Sciences Campus encourages all applicants to seek the broadest intellectual and cultural formation prior to their training in the health professions. Candidates are admitted on a competitive basis. They must present evidence of successful completion of all admission requirements for the program in which they are interested. In most programs, an admissions committee will also consider nonacademic factors as additional criteria in evaluating applicants. An application fee has been established for each academic program. Applicants should submit their electronic application available in the campus webpage: http://sistemas.rcm.upr.edu/admisiones. Documents required upon submission of the application must be sent to:

UPR-Medical Sciences Campus
Central Office of Admissions
P.O. Box 365067
San Juan, Puerto Rico 00936-5067

Transfers

A student from another institution of higher learning who applies for admission to the University of Puerto Rico, or a student who has previously been enrolled as a transient student and meets the admission requirements for a given program, will be considered a transfer student. The Office of Admissions in consultation with the admissions committee of the different faculties will process applications of transfer students. Applicants must have satisfactorily completed the requirements established by the program they are applying to and should submit their electronic application available in the campus web page, as indicated above.

Internal Transfers/Articulated Transfer

Internal transfers or in-transfers refer to those students who transfer from one unit of the University of Puerto Rico System to another. All programs leading to an associate or bachelor's degree accept most students as in-transfers. Students take introductory courses at various units of the University of Puerto Rico System and then transfer to the Medical Sciences Campus to pursue their professional education. Only the School of Health Professions and the School of Nursing accept in-transfer students. For specific information, please refer to the admissions section of each program.

The selection of students from the University of Puerto Rico System who apply for in-transfers is made based on an academic average formula determined by the program. All applicants must comply with application deadlines and meet the following requirements*:

- File an application at the Registrar's Office of their unit of origin, which will submit the application to the registrar of the appropriate unit. Applications sent directly by students will not be considered.
- Have approved the minimum number of credits required by the specific program. Meet the general academic index requirements of the unit to which transfer is being requested, as well as other requirements of the unit, college, or department.
- Pay a nonrefundable $20.00 fee plus $5.00 for the cost of transcripts, $30.00 plus $20.00 for late applications, $30.00 plus $30.00 for readmission-transfer of inactive students, and $49.50 plus $45.00 for late readmission-transfer of inactive students.

Applications for in-transfers will be considered only for the first term of each academic year unless otherwise announced for a particular degree program.

Transfer regulations are established in Certification No. 115, 1996-97 of the Board of Trustees.

*This information is subject to constant change due to updates.

Readmissions

Students who interrupt their studies may apply for readmission by filing an application for readmission at the Office of the Registrar before the deadline set for the academic term. The Office of the Registrar will send the application to the corresponding school or division for the Dean's consideration. The Dean will make a decision considering, among other things, previously established time limits for each program. The Registrar will be notified of the decision within thirty days prior to the academic session for which the student is seeking readmission.

The school will notify the student of the decision made by the Dean or Program Director. Readmission of candidates will be governed by the following regulations:

- First year students who interrupt their studies before the end of the first academic session must comply with the admission requirements in effect during the year in which they apply for readmission.
- First year students who complete the first academic session but who do not register for the second one, or who have withdrawn their registration before completing the session, must comply with the minimum grade point average required of first year students at the end of the academic year. If this requirement is not fulfilled, readmission, if granted, will be provisional.
- Students who satisfactorily complete their first year of studies or beyond, and graduate students who interrupt their studies voluntarily, may apply for readmission to any academic session subject to all general regulations.
- Students suspended for disciplinary reasons may apply for readmission for the academic session following the end of the suspension period. The school dean, upon recommendation of the Dean of Students, will decide as to the student's readmission.
- Readmission may not be granted if the student has violated institutional regulations during the period in which he/she was suspended.
- Students from other accredited institutions who have previously been admitted as transient students may only apply for readmission as special students. They must submit authorization letters from the Dean of their school and the Registrar of their institution of origin. They should also submit official academic transcripts from all university level institutions they have attended. The Dean of the school will decide as to readmission in these cases. Students who wish to be classified as regular students must meet all requirements for admission by transfer and submit their admission application form to the program selected.
- Students who have been suspended for poor scholastic standing may apply for readmission after the minimum waiting period established by the department. The Dean of the school will decide as to readmission in those cases.
- The Registrar (or the Director of Admissions in some cases) will be responsible for compliance with the rules hereby established.

Norms for Course Validation, Substitution, and Exemption of Courses

The Registrar's Manual describes the norms for the validation of courses taken at other universities. It is important to refer to this manual for specific information on the norms and procedures applicable to validation of courses. Criteria for validation of courses, as established by the UPR System are level, content, and duration of the course. In order to graduate from the Medical Sciences Campus, all transfer students are required to complete at least the last year before graduation as regular students at the MSC. The analysis and determination of which courses are validated, is performed at faculty level. This process should be completed at the beginning of the first academic session in which the student is enrolled. All validation cases are processed by the Registrar's Office once the Program Director and the school Associate Dean for Academic Affairs approve them.

Norms and procedures for course substitution apply to courses taken in other units of the UPR system. These are stated the MSC Registrar's Manual. Criteria for validation of courses, as established by the UPR System are level, content, and duration of the course. At the undergraduate, first professional, and graduate level, there is a minimum grade required for substitution of a course. The Associate Dean for Academic Affairs of the school authorizes, in consultation with the department or Program Director, the substitution of courses before the student begins studies in the program to which he/she has been admitted. All validation cases must be processed by the Registrar's Office once the Program Director and school Associate Dean for Academic Affairs approve them.

Exemption from the requirement to take a course may be granted when the student provides evidence of having approved the content as part of a previous degree of the same level, obtained at the UPR System or at another accredited institution of higher education. In exemption cases, the student must replace the course credits with another course or courses that the Program or Department Director determines is/are appropriate to strengthen or supplement the student's education. The specific norms regarding grade requirements, grade point average calculation, and other relevant matters are covered in Section VIII-L of the MSC Registrar's Manual.

Norms regarding the acceptance of courses when the student has approved the course as part of a previous degree of the same level and obtained at the UPR System are available in the MSC Registrar's Manual. Students must replace the course credits with another course or courses that the Program or Department Director determines is/are appropriate to strengthen or supplement their education. Courses approved through this mechanism are registered in the student's academic record, taken into account for the calculation of the cumulative general grade point average, but not considered for the graduation index. Particular norms have been established for students of the Doctor of Dental Medicine program. Please refer to the MSC Registrar's Manual at http://daa.rcm.upr.edu/registrars-office/.

REGISTRATION

The following rules govern registration procedures:

- The Registrar is responsible for the enforcement and implementation of all rules and procedures, which govern the registration process.
- The Registrar will only validate class programs.
- Students must comply with the registration deadlines established for the academic year.
- The Registrar may allow a person authorized by the student to process his/her registration. The person will present written authorization from the student and personal identification. In such cases, the student identification card will be validated after registration is completed.
- Late registration carries a penalty of $20.00.
- The student is responsible for completing all the required registration forms.
- Registration will not be complete until all tuition, special fees, and deposits are paid.

- In order to be eligible for registration, the student must pay all debts previously contracted with the University.
- The Associate Dean of the school to which the student belongs must recommend late registration to the Registrar.

Tuition and Fees

Tuition, fees, and other charges applicable to programs in the Medical Sciences Campus are described as approved by the Governing Board at the date of publication of this Bulletin. Additional expenses may be incurred, depending on the program. All amounts and fees are subject to change. Tuition and fees are to be paid by the student at the time of registration.

Self-financing programs at the MSC include, but are not limited to:

School of Pharmacy
Master of Science in Pharmacy with specialty in Industrial Pharmacy
Master of Science in Pharmacy with specialty in Pharmaceutical Sciences

Faculty of Biosocial Sciences and Graduate School of Public Health
Doctor of Public Health with Specialty in Health Systems Analysis and Management
Doctor of Public Health with Specialty in Social Determinants of Health
Master of Public Health with Specialty in Environmental Health - Evening Program
Master of Public Health General Option - Evening Program
Master of Public Health with Specialty in Gerontology - Evening Program
Master of Public Health Education - Evening Program
Graduate Certificate in Gerontology
Graduate Certificate in Developmental Disabilities Early Intervention

School of Health Professions
Doctoral Program in Audiology (AuD)
Master of Science in Clinical Laboratory Sciences (with Emphasis in Molecular Diagnostics)

School of Nursing
Doctor of Nursing Practice with specialty in Anesthesia
Doctor of Philosophy in Nursing

Joint Degree Program
Master of Science in Clinical and Translational Research

Tuition Fees for New Students Admitted During Academic Year 2023-2024*
(US Citizens Residents of Puerto Rico)

First Professional/Doctorate degree	
Medicine Doctor (MD) degree	$17,500.00/year
Doctor of Philosophy (PhD) in Biomedical Sciences degree	$215.00/credit
MD-PhD concurrent degree	$290.00/credit
School of Dental Medicine	$17,000.00/year
International Students	$60,000.00/year
Doctor in Public Health with Specialty in Environmental Health (DrPH)	$290.00/credit
Doctor in Public Health with Specialty in Health Systems Analysis and Management (DrPH)	$290.00/credit

Doctor in Public Health with Specialty in Social Determinants of Health $290.00/credit
Doctor of Philosophy in Nursing $7,500.00/year
Doctor of Nursing Practice with specialty in Anesthesia $500.00/credit
Doctor of Pharmacy $13,000.00/year
Doctor of Philosophy in Pharmaceutical Sciences $290.00/credit
Doctor of Audiology $290.00/credit
Doctor of Physical Therapy $290.00/credit

Graduate Programs and Graduate Certificates

Semester and Trimester Courses $205.00/credit
Master of Public Health with Specialty in Gerontology $200.00/credit
Post-Bachelor Certificate in Cytothecnology $2,405.00/year
Post-Bachelor Certificate in Dietetic Intership $2,405.00/year
Master of Science in Clinical Laboratory Sciences $5,600.00/year

Undergraduate Programs

Baccalaureate programs $157.00/credit
Associate Degree programs $157.00/credit

Additional Fees

Summer Maintenance Fee $50.00
Laboratory Rights $100.00
Graduation Rights $80.00
Other Maintenance Rights $67.00
Admission Application $30.00
Re-Admission $35.00
Fees for late tuition $20.00
Transfer to other Institutions $50.00
Transfer from other universities $50.00
Transfer with the UPR Units $25.00
Transcripts and Certificates ..... $ 5.00
Document Duplicates ..... $ 5.00
Change of Faculty or Reclassification $20.00
Identification Card $10.00
Fees for partial drop in courses $10.00
Fees for full drop in courses $15.00
Repetition of Courses $20.00

Maintenance and Technology Fees

Undergraduate programs

- Maintenance fee $100.00
- Technology Maintenance fee $50.00

Graduate programs

- Maintenance fee $175.00
- Technology Maintenance fee $75.00

Annual graduate programs

- Maintenance fee $350.00
- Technology Maintenance fee $150.00

Special Fees for Annual Graduate programs	1er año	2do año	3er año	4to año
Maintenance and Technology Fees	$600.00	$600.00	$600.00	$600.00
School of Medicine	$6,904.00	$6,132.00	$5,783.00	$4,421.00
School of Dental Medicine				
Virtual Library	$2,011.00	$1,104.00	$1,094.00	$1,121.00
Educational Resources	$2,900.00	$2,900.00	$2,900.00	$2,900.00
Instrumentation and Materials	$6,000.00	$6,000.00	$7,513.00	$6,655.00
International Students & Advanced Programs-Virtual Library	----------	----------	$2,122.00	$1,665.00
International Students & Advanced Programs-Educational Resources	----------	----------	$2,900.00	$2,900.00
International Students & Advanced Programs-Instrumentation & Materials	----------	----------	$7,000.00	$7,000.00
School of Pharmacy-PhD	$2,750.00	$3,260.00	$3,260.00	$3,260.00
School of Nursing				
PhD	$ 500.00	$ 500.00	$ 500.00	----------
DNP-SA	$ 2,000.00	$ 2,000.00	$ 2,000.00	----------

*The University of Puerto Rico reaffirms its commitment in procuring an open and accessible university, characterized by academic excellence, administrative efficiency and good use of human and fiscal resources. With **Certification No. 155, 2023-2024 of the Governing Board** it extends the same tuition cost and fees as previous years as stated in **Certification No. 160, 2022-2023 of the Governing Board of the University of Puerto Rico.** This information is subject to constant change due to updates, please be aware of updates, check with the Campus Collection Office. There may be additional or different charges for programs, courses or services.

Health Insurance - May vary on an annual basis according to negotiations with insurance companies and type of coverage.

Nonresident Students: U.S. Citizens and Foreign Citizens
Undergraduate Programs, Master Programs and Doctoral Programs

In Certification No. 72, 2022-2023 of the Governing Board of the University of Puerto Rico, it was established that as of the academic year 2020-2021 the cost of tuition, at the University of Puerto Rico, for Non-Resident Students and International Students will be equal to the cost of tuition for Local or Resident Students, with the exception of the cost of credit for non-resident students of the School of Medicine, School of Dental Medicine, School of Pharmacy and Doctor of Nursing Practice with specialty in Anesthesia (DNP-SA) Program of the Medical Sciences Campus.

*There may be additional or different charges for programs, courses or services.

Honor Registration

Honor registration is an economic aid that offers the by the University. This financial aid applies only to undergraduate students. The rules are established in Certification 4, 2019-2020 of the Governing Board of the University of Puerto Rico "*Política Institucional sobre la Otorgación de Ayudas Económicas para Estudiantes con Distinciones Académicas en la Universidad de Puerto Rico*".

Student Classification

Students are classified as follows:
Full-time Student

One who has fulfilled admission requirements, has the express authorization from the Dean, and is registered in any of the regular academic programs of the Medical Sciences Campus for at least the number of credits established as full-time load for the particular program. The student may be a candidate for a degree, diploma, or certificate as long as he/she maintains the retention index established by the school or division.
Part-time Student

One who has fulfilled admission requirements, is a candidate for a degree, diploma, or certificate, and carries less than the number of credits established as full-time load for the particular program.

Transient Student (Special Permit)

One who is a student from another accredited university or college, who applies for the first time, and who takes courses with the intention of transferring the credits to his/her institution.

Visiting Student (Audit)

One who has not fulfilled admission requirements and is not a candidate for a degree, diploma, or certificate. A visiting student audits classes with the consent of the Department Director and pays applicable fees, but may not receive a grade for the course.

Special Student

One who has already received a degree and is enrolled in a course of his/her interest, not seeking as academic degree.

Exchange Student

An exchange student is a student from another institution that maintains formal student exchange arrangements with programs on campus. Exchange students pursue studies for a pre-established period.

Grading System

Unit of Instruction

In the Medical Sciences Campus, the credit is the basic unit of academic accountability of learning experiences of students (unit of instruction). It can be expressed in semester credits of trimester credits. In the Medical Sciences Campus, the semester has duration of 17 weeks, while the trimester is 14 weeks. The Medical Sciences Campus uses semester or trimester credit hours as the unit of instruction in the following schools: Faculty of Biosocial Sciences and Graduate School of Public Health, School of Pharmacy, School of Nursing, School of Dental Medicine (only in residency programs), School of Medicine (only in Biomedical Sciences Graduate Programs) and School of Health Professions.

The first professional degree programs at the School of Medicine (MD) and Dental Medicine (DMD), and the Dietetic Internship Post-baccalaureate Certificate Program (School of Health Professions) use the total hours per calendar year as the unit of instruction for granting credit for work done towards a degree.

Attendance and Evaluation Procedures

Professors are responsible for implementing the necessary mechanisms to verify the attendance of students and how this is to be taken into consideration for the final grade.

Final summative assess or written final examinations must be given in all courses unless other evaluation instruments are designed. Professors must evaluate the work rendered by the student using the method they deem most appropriate, provided the use of rubrics that warrants their objectivity in determining grades.

Grades

The Medical Sciences Campus programs use the following grading system:

- **A** Excellent
- **B** Good
- **C** Fair
- **D** Deficient
- **F** Failed
- **P** Passing but not considered in computing the grade point average
- **W** Withdrawal
- **I** Incomplete
- **EP** In progress
- **NP** Not passed
- **NR** No grade reported
- **W*** Unofficial withdrawal
- **H** Honor
- **S** Satisfactory

The grade point average is calculated on a 0 to 4 scale in which A = 4.

Incomplete

A student may receive an incomplete when the professor considers there was a justifiable reason for the student's failure to comply with all course requirements. If the student does not make up the deficiency before the end of the following academic session, or if special arrangements are not made in programs operating in other time units, an F will be recorded.

Grade Point Average

The grade point average is the measure of the student's academic achievement. It is computed by dividing the total number of honor points by the total number of credit units in those courses in which the student has received a final grade. When computing the graduation average, only required and elective courses in a program of study will be considered. Honor points for each grade are as follows: A=4, B=3, C=2, D=1, and F=0.

Courses marked W, NP, EP, I, H, S, or NR are not counted. Grades for the summer session are considered for the grade point average of the following year.

Withdrawals

Students may withdraw from courses during the period established by the Registrar after officially notifying the professor and obtaining permission from the Department Director and the Dean. The Registrar will post a "W" on the student's permanent record and no grade will be given for any work performed in the course.
A student may totally withdraw from the University of Puerto Rico at any time up to the last day of classes. He/she must obtain written permission from the Dean. The Registrar will post a "W" on all courses for that session.

Policies on registration cancellation and refund are available in Section VII 8b of the *Registrar's Manual* available in the webpage Student Portal.

Refund Regulations

Criteria for refund of registration fees are described in the MSC *Registrar's Manual*. It is important to consult this manual for specific information on partial and full withdrawal processes including cancellation of registration. Students are entitled to a refund of 100%, 50%, or 25% of the basic registration fee (except for other regular and special charges) depending on the date of withdrawal. Specific dates for each amount of refund are published in the *Academic Calendar*.

Student Promotion

The Promotions Committee, or any other body charged with this responsibility at the particular school, evaluates the student's academic performance. Students who meet all criteria and requirements stated in the promotions rules and regulations of their school will be promoted.

If the student does not meet the established criteria and/or requirements, the Committee will make specific recommendations to the Dean. These may include a probationary period, retaking courses, or suspension due to academic deficiencies.

Study benefits for veterans will cease once the student completes the minimum number of required credits.

GRADUATION

The University of Puerto Rico reserves the right to make changes in program and degree requirements. As a rule, a student is entitled to graduate when he/she meets the curriculum requirements in effect at the time of his/her admission to the institution. Students who do not satisfy the graduation requirements within the period established for their program of study and students who reenroll after a period of absence will be governed by the requirements applicable to the class with which they graduate.

In order to receive a degree, diploma, or certificate from the University of Puerto Rico, candidates must satisfy the following general requirements:

- Candidates must have completed the program of study with the minimum grade point average established for the particular program.
- Remedial courses are not considered regular courses of a program and are not considered towards earning a degree.
- Undergraduate students and students from the School of Dental Medicine, School of Medicine, and Doctor of Pharmacy Program with a grade point average of 3.30 to 3.49 inclusive, graduate "Cum Laude", with 3.50 to 3.99 they graduate "Magna Cum Laude", and those with a grade point average of 4.00

graduate “Summa Cum Laude”. Only courses required for graduation at the Medical Sciences Campus will be considered in computing the grade point average.

- Candidates must have taken the final 28 credits for the degree, diploma, or certificate at the University of Puerto Rico, with the understanding that these credits are required for the last phase of their program of studies. In exceptional cases, this requirement may be waived by authorization of a committee composed of the Dean of the school or division, the Dean for Academic Affairs, and the Registrar.
- Studies towards the degree, diploma, or certificate must be completed within the maximum time limit established by the particular program. If the student exceeds these limits, the University may require him/her to retake those courses, which, according to his /her Dean, require reviewing. In these cases, the student must obtain a written authorization from the Dean that should include the list of courses, which are to be retaken. The Registrar must confirm this.
- Graduating students must have satisfied all financial obligations with the University of Puerto Rico.
- An application for a degree, diploma, or certificate must be filed at the Office of the Registrar during the registration period of the session in which academic requirements are to be completed and in no case later than the date established in the academic calendar. This also applies to summer session candidates. The application will only be valid if the student has paid diploma fees to the Bursar’s Office.
- The Dean of the school must recommend students for the degree, diploma, or certificate.
- The student will receive the degree during the academic year in which the requirements are completed and graduation is requested.

ALL RULES AND REGULATIONS OF THE REGISTRAR’S OFFICE MAY BE EVALUATED BY THE ACADEMIC SENATE AND ARE SUBJECT TO CHANGE.

STUDENT SERVICES

DEANSHIP FOR STUDENT AFFAIRS

The Deanship for Student Affairs has the responsibility to oversee the activities and support services offered to the student community. The Deanship comprises the following offices: Admissions, Student Center for Counseling and Psychological Services (CECSI, in Spanish), Financial Aid, Student Health Services, Quality of Life, Services for Students with Disabilities, Promotions and Student Recruitment Program, and Extracurricular Activities. Specifically, the Deanship provides, coordinates, and supervises the following:

- Admission processes and procedures to the campus academic programs
- Student financial aid programs
- Student health services
- Student counseling and psychological services
- Promotion of the Medical Sciences Campus academic offerings among potential students, faculty, and counselors of public and private universities, high schools and colleges throughout the island, for recruitment and retention purposes
- Quality of life activities
- Student election processes, such as student councils, student representatives to the University and Administrative Boards and to the Academic Senate
- Official recognition and support services to the various student organizations
- Social, cultural, and sports activities
- Services for Students with Disabilities
- Compliance with the student rules, bylaws, institutional policies, and applicable legislation such as the Campus Security or Jeanne Clery Act, among others
- Student Organizations

Student Rights and Responsibilities

The Medical Sciences Campus and the University of Puerto Rico policies on student rights and responsibilities are included in the *General and Academic Policies* section of this catalog.

Central Office of Admissions

The main responsibility of the Central Office of Admissions is to offer information regarding admission requirements and procedures, process admissions applications, pre-screen completed applications, and refer them to the six campus schools' admissions committees for consideration. The admissions officers give individual attention to all applications in order to facilitate the process.

The Central Office of Admissions is located at Office A-223 in the second floor of the Guillermo Arbona building. Office hours are Monday thru Friday from 7:30 am to 4:00 pm. For more information, please call: (787) 758-2525 extension 5215.

For details on admissions procedures, refer to the *Admissions, Registration, and Graduation Procedures* section in this catalog, as well as Oficina de Admisiones - Decanato de Estudiantes.

Financial Aid Office

The Financial Aid Office is in charge of providing financial aid to qualified students whose financial resources are not sufficient to cover their educational expense
There are three types of financial aid programs available to students at the Medical Sciences Campus: scholarships, work-study, and loans. Scholarships provide financial assistance to students and do not require repayment. In the work-study program, students work in positions available on or off campus and receive payment for services rendered. Students who receive loans must repay all money received after the grace period expires.

Some of the financial aid programs are:
Financial Aid Programs for Undergraduate Students

- Federal Pell Grants
- Federal Supplemental Educational Opportunity Grants (SEOG)
- Subsidized and Unsubsidized Federal Direct Loans
- Institutional Scholarship
- Work Study Program
- Certification #47, 2019-2020, UPR Governing Board
- Certification #148, 2021-2022, UPR Governing Board

Financial Aid Programs for Graduate Students

- Unsubsidized & PLUS Federal Direct Loans
- Legislative Loan & Scholarship - Only for Medical, Dental Medicine, and Veterinary Students
- Institutional Scholarship
- Private scholarships and grants
- Work Study Program

The Financial Aid Office is located at Office A-223D in the second floor of the Guillermo Arbona building. Office hours: Monday to Friday from 7:30 am to 4:00 pm. For more information, please call: (787) 758-2525 extensions 5205/5206 as well as Asistencia Económica - Decanato de Estudiantes.

Student Center for Counseling and Psychological Services (CECSI, for its Spanish acronym)

CECSi services are directed to support student's adaptation to campus, help them to manage personal and academic life span situations, define professional goals, and to promote self-knowledge and healthy lifestyles. The Center has professional counselors and a psychologist. This staff offers a variety of services, such as: Psychotherapy, individual and group counseling, career counseling, meetings and workshops on topics related to student interests. Some of them are Studying Techniques, Job Search, Healthy Relationships, Healthy Eating, among others. The Psychological and counseling services are offered to all active students who request it. Services may be accessed directly at the office by the student, or by referral from professional counselors, professors, other staff, or fellow students. In addition, we have online information for the career decision making in health professions at http://preguntame.rcm.upr.edu/.

CECSi serves as liaison with the Student Affairs Offices of the six Medical Science Campus Schools, some of which also offer counseling services. The Center also coordinates orientation sessions for incoming students, and other activities to serve the student population or specifics needs of a particular group. Information and guidance on graduate and undergraduate studies, workshops to develop job search strategies, interviewing skills, and resume preparation are also provided. All services are available upon request. The center is located

temporarily on the second floor of the School for Health Professions, office 229. Office hours: Monday through Friday from 7:30 am to 4:00 pm. For more information, please call: (787) 758 2525 extensions 5209/5210 or go to http://cecsi.rcm.upr.edu/.

Student Medical Services

Primary Medical Care is provided to all students and residents at the Student Medical Services Clinic of the Deanship for Student Affairs. The clinic provides an outpatient service for all students of the Medical Sciences Campus. The primary care physician (Dr. Frank Valentin Silva) provides comprehensive primary medical care, with the assistance of a registered nurse (Mrs. Carolyn Dominguez) and administrative assistant (Mrs. Terie Rey). Services include initial medical evaluation and follow-up visits for Acute Respiratory Infections, Bronchitis, Gastrointestinal Disorders such as Acute and Chronic Gastritis and Sexually Transmitted Disorders and chronic conditions such as Asthma, Hypertension, Diabetes Mellitus and Thyroid Disease among others.

Inside the medical clinic we have the capacity to provide rescue respiratory therapy for asthmatic patients, and cardiac primary care (EKG machine). Since we are part of a large multidisciplinary medical complex we can refer to and transport patients in need of specialized care through wheelchair assistant or EMT-P by calling the security office of the Medical Sciences Campus. Students in need of a specialist are referred to Hospital Municipal of San Juan.

After regular office hours, or if urgent or emergency care is required, students can be transferred to the Emergency Room of the Puerto Rico Medical Center or to any of the urgent care units in the affiliated hospitals, based on individual care required.

Upon admission to the Medical Sciences Campus, students are required to present proof regarding health status and immunization record, which is kept as part of their medical record in the electronic platform NEXT. Admitted students are required to have health insurance to cover hospitalization and primary care services The insurance may be through a private carrier, the state sponsored health plan ("Mi Salud"), or the UPR system health insurance, offered upon registration. The UPR insurance offers basic coverage, dental care, pharmacy, and major medical coverage may be obtained for an additional fee. These costs may vary annually. The UPR-sponsored Health Insurance has a **family plan coverage for those who need the inclusion of spouse and children.* (*Optional.)

Health maintenance and preventive services are strongly emphasized through immunization protocols and universal precautions. Nurse and Administrative Assistant Staff coordinate on site vaccination clinics year-round with more than one vaccination company including *Walgreens* for our students. The clinic coordinates the administration of influenza, Tdap, Varicella, HPV, MMR and more.

Briefly we administer a vaccine poll to our students, through institutional email to all our students. This builds a pre-register of which vaccines and amount we will administer. We then contact the pharmaceutical company or vaccine institution informing them of the type and approximate vaccine number we will need. Finally, a date and time with the vaccine company is coordinated and promoted through social media.

The clinic also is the reference for the promotion and surveillance of blood borne pathogens and occupational exposure protocols for students and residents of the Medical Sciences Campus which is revised periodically.

The initial doses of antiviral medications are offered free of cost in cases of HIV occupational exposure. Students are then referred to a federally funded program called CONCRA Puerto Rico, which supplies Post-Exposure Prophylaxis services to our student referred and provide the necessary follow-up services (See Appendix X (Puerto Rico CONCRA MOU)

The Student Health Services facilities are officially located on the third floor of the Guillermo Arbona Building Suite B-349. Service hours are Monday to Friday 7:30 a.m. - 4:00 p.m. For more information, please call at (787) 758-7910 ext. 234 or visit the office´s web page at: http://de.rcm.upr.edu/servicios-medicos-a-estudiantes/ .

Office of Services for Students with Disabilities, (OSEI, for its Spanish acronym)

The Office of Services for Students with Disabilities (OSEI) promotes the comprehensive well-being of students with disabilities. It facilitates their full participation in university life, supporting their academic goals in compliance with UPR rules and regulations and state and federal laws that protect the rights of students with disabilities. Guided by its mission and vision, OSEI seeks to empower students with disabilities to reach their fullest academic, personal, and professional potential, while fostering a culture of respect, empathy, and collaboration within the university community. To achieve this, OSEI develops practices and procedures based on equity, preventing misinterpretations or unequal practices that could hinder students with disabilities from thoroughly enjoying their right to equal opportunities.
Among its primary functions, OSEI is responsible for:

- Informing students with disabilities, including those in the admissions process, about the availability of reasonable modifications and academic services at the RCM.
- Receiving, evaluating, and coordinating reasonable modifications and academic services requested by students with disabilities.
- Addressing situations or complaints from students with disabilities when contradictions arise regarding reasonable modifications or academic services.

What is a reasonable modification?

Adaptation or appropriate adjustment to allow or enable a person with a disability to participate in curricular and extracurricular educational activities, as well as in academic, recreational, sports, and cultural settings within the formal learning process.
Providing reasonable modifications does not mean creating different standards, but instead aligning the student's needs and strengths with the curricular requirements of the academic program.
Reasonable modifications are prospective and will be recommended based on information gathered through interviews and medical evidence.

Location and Contact Information

Third floor of the Guillermo Arbona Building, Office B-349.
Telephone: (787) 758-2525, extensions 4006, 4002.
Email: osei.rcm@upr.edu
Service hours: Monday to Friday, 8:00 AM – 4:00 PM (Services outside these hours are available by appointment.)

Promotions and Student Recruitment Program

The Promotions and Student Recruitment Program plans, coordinates, and develops activities designed to promote the academic offerings and student services on campus. Its main objectives are the recruitment of top qualified students, thus increasing the number of applications to the different programs and improving student retention. The program designs recruitment strategies that target university students as well as high school and younger students of both public and private institutions. Candidates receive orientation about academic offerings, admission requirements, student aid, and academic programs costs. At the same time, teachers and counselors receive valuable information for their orientation and counseling activities.

The office is located at Office A-223 in the second floor of the Guillermo Arbona building. Office hours: Monday through Friday from 8:00 am to 4:00 pm. For more information, please call (787) 758-2525, ext. 2016) or send an email to estudiantespanteras.rcm@upr.edu . Webpage: Oficina de Promoción y Reclutamiento - Decanato de Estudiantes.

Quality of Life Office

The Deanship for Student Affairs promotes quality of life and wellness among students. Most initiatives are coordinated by the Quality of Life Office, which encourages healthy lifestyles and promotes secure environments on campus. Educational and extracurricular activities coordinated during the academic year are special interest conferences, participatory training, quality of life fairs, among other educational and social activities and services. All seek to foster a balanced lifestyle. Services and activities programmed by the office are offered free of charge to the campus student community.

The Quality of Life Office is also responsible for promoting compliance with university policies related to the prevention of alcohol and drug abuse on campus, security, violence, sexual assault, and sexual harassment. It collaborates actively to ensure compliance with Federal Regulations such as the Drug Free School and Campuses Act, the Campus Security Act (Jeanne Clery Act), and the program against sexual assault of the U.S. Department of Education (Title IX). It also coordinates activities with the campus Security Office.

The office is located at Office A-236 in the second floor of the Guillermo Arbona building. Office hours: Monday through Friday from 7:30 - 3:30 pm. For more information, please call (787) 758-2525, ext. 5228).

Cultural Activities Office

The Cultural Activities Office sponsors events for the cultural development of students and the campus community. These include concerts, conferences, dances, lectures, films, variety shows, and plays offered throughout the academic year.

Other Services and Activities

Medical Sciences Campus Choir

The Medical Sciences Campus Choir brings together members of the academic community, professors, students, and staff. The choir participates in official institutional activities on and off campus and in the community.

Student Center

The Student Center is located on the upper level of the parking building adjacent to the Guillermo Arbona Building. There is a multipurpose area for relaxation, study, and for social and religious activities.

Government and Student Organizations

Each year, Medical Sciences Campus students meet for the purpose of electing class boards, school student councils, and the General Student Council, as well as for appointing representatives to institutional bodies and committees.

- *Class Boards*
  Students elect class boards to serve as liaisons between the students and the administration. They also organize social, athletic, and other activities.

- *School Student Councils*
  School student councils are elected on a yearly basis. Their members are the official student representatives and spokespersons.
- *General Student Council*
  The General Student Council is composed of its President, two members from each school student council, the student representatives to the Academic Senate, and the student representative to the Administrative Board and University Board.
- *Disciplinary Board*
  Students select two representatives to the Disciplinary Board through the General Student Council, thus insuring student representation in disciplinary actions.
- *Faculty Meetings*
  Students in each school have the right to elect a number of representatives to faculty meetings. This number may not exceed 10 percent of the total number of faculty members at the school.
- *Faculty Standing Committees*
  There are some standing committees in which students have representation, including curriculum, admissions, and books and instruments. Representation may vary at each school depending on existing committees.
- *Academic Senate*
  Students from each school elect a student representative to the Academic Senate. The President of the General Student Council is also a student representative in this body.
- *Administrative Board*
  Students elect a representative to the Administrative Board through the General Student Council.
- *University Board*
  Medical Sciences Campus students elect one student representative to the University Board.

Student Membership in Professional and Fraternal Organizations

The Student Regulations of the Medical Sciences Campus, provide in Article 33, that student organizations are indispensable organisms for the development of an active and vigorous student life, both with the physical, artistic and intellectual aspect, and the ethical aspect of a fruitful life in community conducive to love and respect among human beings. The Medical Sciences Campus has about 65 recognized student organizations. Each of the six schools has its own organizations, according to the academic programs and interests of its students. For the full list of organizations, please access the following link: https://de.rcm.upr.edu/organizaciones-estudiantiles

Deanship for Student Affairs Faculty:

CAÑUELAS-PEREIRA, CARLOS - *Counselor III*; EdD, 2011, University of Puerto Rico - Rio Piedras Campus
HERNÁNDEZ-MALDONADO, MARÍA - *Psychologist II*; PhD, 1999, University of Puerto Rico - Rio Piedras Campus
PAGÁN-DELGADO, MARIBEL - *Counselor II*; MA, 1998, Rollins College-Florida Campus

GENERAL AND ACADEMIC POLICIES

General Bylaws of the University of Puerto Rico

The *General Bylaws of the University of Puerto Rico* was amended on November 30, 2016 (Board of Trustees Certification No. 160 (2014-2015). It establishes the rules and regulations applicable to the University System governance and organization, which are necessary for the attainment of the goals of the University of Puerto Rico. It includes general provisions about the composition and governance of the system, including those that apply to academic and non-teaching personnel. Copy of the General Bylaws of the UPR is available at https://juntagobierno.upr.edu/reglamentos-mas-utilizados/ .

University of Puerto Rico General Student Bylaws

The *University of Puerto Rico General Student Bylaws* was amended on March 16, 2017 (Board of Trustees Certification No. 70 (2016-2017). It establishes the rights and duties of students as members of the academic community and fosters their responsible participation in academic life https://juntagobierno.upr.edu/reglamentos-mas-utilizados/.

Medical Sciences Campus General Student Bylaws

The *Medical Sciences Campus General Student Bylaws* establishes the rights and responsibilities of MSC students and addresses particular issues as they apply to them http://de.rcm.upr.edu/politicas/. The *University of Puerto Rico General Student Bylaws* supersedes the bylaws established by the units.

Language of instruction

Spanish is the language of instruction in most courses; students are required to have a working knowledge of English as well.

Equal opportunity

The Medical Sciences Campus abides by the University of Puerto Rico non-discrimination policy as it does not discriminate against any person for reasons of sex, race, color, place of birth, age, physical or mental handicap, origin or social condition, political or religious beliefs, sexual preference, gender, ethnicity, veteran status, or for being a victim or perceived as a victim of domestic violence, sexual assault, or stalking. The University of Puerto Rico non-discrimination policy is established in the Board of Trustees Certification No. 58 (2004-2005). Applicants for academic admission or employment and students or employees, who feel they have been discriminated against for any of the reasons previously stated, may file a written complaint with the Chancellor.

In order to address reasonable accommodation requests from students, the Medical Sciences Campus has established the procedures to be followed by students and institutional officials. The document *Proceso de Tramitación de Solicitud de Acomodo Razonable para Estudiantes* is available in the Deanship for Student Affairs Office and in the Student Affairs Offices of each school. Other information on rights and services available to students with disabilities is posted in the MSC Student Portal webpage http://de.rcm.upr.edu/.

Privacy of educational records

The University of Puerto Rico complies with the provisions of the Buckley Amendment (Family Educational Rights and Privacy Act of 1974, as amended). This law protects the privacy of students' educational records and

establishes the student's right to examine his/her files. It also provides guidelines for correcting the accuracy of the information contained in those files through informal and formal hearings. Students wishing to do so may file a request with the Family Policy Compliance Office, US Department of Education.

Office of the Student Ombudsperson

The Office of the Student Ombudsperson offers intercession, mediation, negotiation, and conciliation services and makes referrals to arbitration services, if needed. The Board of Trustees Certification No.32 (2005-2006) created the ombudsperson office. This office is committed to helping students solve situations that may affect their life on campus.

Campus Security

The Surveillance and Security Office of the Medical Sciences Campus is located on the first floor of the indoor parking of the main building. Its mission is to provide safety and security to the campus community and facilities 24/7. Emergency call boxes are located throughout the campus to provide instant communication with the Security Office. A campus-wide video camera system is also in place. Upon request, security officers provide escort service for students and staff members on campus after 6:00 pm. In an emergency, individuals should contact the office at 758-2525, extensions 1000 or 1001.

The Medical Sciences Campus complies with the 1990 Clery Act, as amended. For information concerning alert bulletins, crime statistics, and other issues, please refer to the campus webpage under *Seguridad en el Campus* https://rcm2.rcm.upr.edu/seguridad-en-el-campus/.

Smoking, illegal drugs, and alcohol abuse

Smoking is forbidden in all enclosed campus areas, including but not limited to classrooms, laboratories, lecture rooms, elevators, auditoriums, offices, museums, and all other places where groups of persons regularly meet. Smoking is permitted in open spaces outside the buildings.

The Medical Sciences Campus is committed to the UPR System vigorous policy to combat the manufacture, distribution, supply, possession, and use within its grounds of controlled substances and illegal drugs, as defined by the applicable laws. The policy and the procedures for enforcement are detailed in University of Puerto Rico Board of Trustees Certification No. 33 (2005-2006).

Protection of human subjects in research

The Medical Sciences Campus of the University of Puerto Rico complies with all federal regulations regarding human subjects in research. The Human Research Subjects Protection Office serves as the administrative office for the UPR MSC Institutional Review Boards (http://irbrcm.rcm.upr.edu/). The Institutional Review Boards, or IRBs, are the committees that must review all research involving human subjects at the UPR MSC and affiliated institutions, to assure compliance with institutional ethical standards and federal regulations, and that the rights of human subjects are protected in all investigations.

As per Assurance (FWA 00005561), the institution is committed to guaranteeing that all research involving human subjects or analysis of data gathered from human subjects, regardless of funding status, be reviewed by the IRB prior to the implementation of any research activity.

Use of animals in research

The Medical Sciences Campus complies with all applicable federal statutes and regulations concerning the use of animals in research. The Institution Animal Care and Use Committee must review all research involving the use of animals on campus and affiliated institutions to assure compliance with institutional ethical standards and federal regulations and guarantee that animals are humanely cared and protected in all ongoing investigations.

Policy on patents and inventions

UPR Board of Trustees Certification No.132 (2002-2003) establishes the policy and procedures for disclosure and assignment of patents on inventions created as part of work done at the UPR or with the use of university resources. Its requirements extend to all employees including independent contractors, full or part-time, as well as students, faculty, professionals, researchers, visiting professors, and visiting scientists.

Authorship

Faculty and students of the University of Puerto Rico will retain authorship of works created in the normal course of academic activities, unless otherwise agreed. The University of Puerto Rico will be the owner of the work if it is the outcome of academic or administrative endeavors officially commissioned and assigned by the institution, unless otherwise agreed. The policy on authorship also establishes criteria for partial copyright ownership, authorship on works produced while on sabbatical or leaves. It also establishes the responsibility of students and faculty to register and protect their author rights, procedures to resolve disputes over copyright ownership, and other issues. A student is presumed to have authorship of his/her thesis and other similar academic works unless otherwise agreed. The institutional policy on authorship is stated on Council on Higher Education, Certification No. 140 (1992-1993).

Scientific misconduct

Scientific misconduct constitutes unacceptable behavior for faculty, staff, and students, and the University of Puerto Rico prohibits it. The system-wide *Policy and Procedures on Responding to Allegations of Possible Research Misconduc*t is stated in the Board of Trustees, Certification Number 45 (2006-2007). Any faculty member, student, or staff who believes in good faith that an act of research misconduct is taking place or has taken place at UPR has an obligation to report his/her concerns to UPR officials or directly to the Research Integrity Officer on campus. Institutional members will also cooperate with the Research Integrity Officer and other institutional officials in the review of allegations of research misconduct and in conducting inquiries and investigations. Institutional members, including respondents, have an obligation to provide evidence relevant to research misconduct proceedings to the Research Integrity Officer or other appropriate institutional officials. The policy on research misconduct defines research misconduct, establishes procedures for conducting and reporting the inquiry and investigation, institutional administrative actions that may be adopted if a finding of research misconduct is substantiated, reporting to the pertinent agencies (when required), appeal process, and protective measures to guarantee the rights of complainants, witnesses, and respondents.

Policy on the use of information technology

The *System-Wide Policy for the Acceptable Use of Information Technology Resources* (UPR Board of Trustees Certification No. 35 (2007-2008) at: http://osi.rcm.upr.edu/recursos/ , grants UPR community members access to information technology resources in order to facilitate their university-related academic, research, service, and work activities. Users are required to use information technology resources effectively, efficiently, and responsibly; in a manner that does not affect the quality, timeliness, or delivery of a person's work to the University nor hamper the rest of the community's ability to conduct their work for the University. As censorship

is incompatible with the goals of an institution of higher education, information accessible from available electronic sources may not be restricted through censorship, as long as this information is not constrained by law or regulations and it is used for lawful purposes. By using the University's information technology resources, users agree to abide by the institutional policy as established by UPR Board of Trustees Certification Number 35 (2007-2008), as well as to abide by all relevant university policies, norms, and procedures, and current federal and Commonwealth laws. Users should review, understand, and comply with all policies, procedures, and laws related to access, acceptable use, and security of university information technology resources. They should request from system administrators or data custodians clarification on access and acceptable use issues not specifically addressed in university policies, regulations, standards, and procedures. They should also report possible policy violations to the appropriate entities. The institutional policy also states regulations on privacy and security, consequences of violations, and rights and responsibilities of the University, among others.

Policy on sexual harassment and sex discrimination

Sexual harassment includes but is not limited to unwelcome sexual advances, request for sexual favors and other conduct (physical or verbal) of sexual nature when submission to or rejection of this conduct implicitly or explicitly affects the person's employment or education, unreasonably interferes with a person's work or educational performance, or creates an intimidating, hostile, or offensive work environment. The University of Puerto Rico does not tolerate any form of sexual harassment or sex discrimination. The University takes affirmative measures to prevent sexual harassment and sex discrimination and responds to reports of such conduct. For informal grievance procedures, students should be referred to the Student Ombudsperson. Formal procedures require the President or the Chancellor to submit the allegation to an Examining Official. Further information on this institutional policy, as well as on formal and informal procedures to pursue an allegation of sexual harassment or sex discrimination are stated by UPR Board of Trustees Certification Number 130 (2014-2015).

Institutional policy on uncivil conduct

Uncivil conduct is not tolerated in the Medical Sciences Campus. All members of the academic community are expected to follow civil behavior and democratic principles. Uncivil conduct creates a tense and intimidating climate where aggression and anger prevails, thus reflective learning is hampered. It also encompasses rivalry and lack of sensibility, where attitudes of power and subjugation are disguised as professionalism and rationality. The Medical Sciences Campus Academic Senate Certification No.24 (1999 2000) states the policy on uncivil behavior: http://epsportalstu.rcm.upr.edu/Docs/Documents/Forms/AllItems.aspx?RootFolder=%2FDocs%2FDocuments%2FPoliticas%20Institucionales .

Release time to attend meetings of the Academic Senate and its committees

Student Senators will be excused from academic activities in case of conflict with the schedule of the Academic Senate and the committees of which the student is a member. The student will be held responsible for making up the course work by agreement with the professor in charge of the activity (Medical Sciences Campus Academic Senate Certification No. 068 (1996-1997): http://senadoacademico.rcm.upr.edu/documentos/.

Excused absence and deferment from examinations

Deferment from examinations is available to students who were absent for reasons of illness or emergency and who have received written authorization from their instructors. An application form and corresponding evidence should be submitted one week prior to the examination. The student is not excused until he and the professor

sign this form. The student, a classmate, or a family member, must verbally report to the instructor requests for absence from examinations for unforeseen events or illnesses. In this situation, the application form and corresponding evidence should be submitted as soon as possible.

Applications for deferred examinations are available in the course manual, at the professor's office, course coordinator's office, Office of the Associate Dean for Academic Affairs, and Office of Student Affairs. The student should file the original signed application to the Office of Student Affairs. Medical Sciences Campus Academic Senate Certification No. 029 (2013-2014) November 7, 2018, as amended, establishes the policy on excused absences from academic activities and makeup work. This certification includes specific information on the type of evidence required, time limit for the professor to answer the petition, and due process, among others http://de.rcm.upr.edu/politicas/ .

Excused absence and completion of academic activities

In order to facilitate participation of students in extracurricular activities such as congresses, forums, workshops, research projects, interdisciplinary initiatives, community activities and sports events at local, national or international levels, the Medical Sciences Campus Senate has established general norms to excuse students from academic activities previously established in the curriculum and to guarantee that the necessary make up of content and/or experiences is available to the student. Students should fill a specific form to excuse themselves from the academic activity as soon as possible and submit it to the coordinator or professor of the course, including the corresponding evidence. The student will also coordinate with the professor the specific activities that will substitute those for which he/she is being excused. The student to the Dean or to the Assistant Dean for Student Affairs for final approval should also submit the form, approved by the professor or coordinator of the course, and the corresponding evidence. Certification No. 040, 2004-2005 of the MSC Academic Senate includes the document that establishes the due process to be followed by the student and faculty (http://de.rcm.upr.edu/politicas/).

Academic Integrity

The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Article 6.2 of the UPR Students General Bylaws (Board of Trustees Certification 13, 2009-2010) states that academic dishonesty includes, but is not limited to: fraudulent actions; obtaining grades or academic degrees by false or fraudulent simulations; copying the whole or part of the academic work of another person; plagiarizing totally or partially the work of another person; copying all or part of another person answers to the questions of an oral or written exam by taking or getting someone else to take the exam on his/her behalf; as well as enabling and facilitating another person to perform the aforementioned behavior. Any of these behaviors will be subject to disciplinary action in accordance with the disciplinary procedure laid down in the UPR Students General Bylaws. To ensure the integrity and security of user data, any hybrid, distance, and online course should be offered through the institutional learning management platform or by tools required by the course, which uses secure connection and authentication protocols. The system authenticates the user's identity using the username and password assigned in their institutional account. The user is responsible for keeping the password secure, protecting, and not sharing with others.

Reasonable Modification Statement

The University of Puerto Rico (UPR) acknowledges the right of students with disabilities to an inclusive, equitable, and comparable post-secondary education. In accordance with its policy toward students with disabilities, based on federal and state legislation, every qualified student with disabilities is entitled to equal participation in those services, programs, and activities that are physically, mentally, or sensorially natured and have thus substantially affected one or more major life activities, such as their area of post-secondary studies.

They have the right to receive reasonable accommodation or modifications. If you require accommodation or reasonable modification in this course, you must inform the professor without the need to disclose your condition or diagnosis. Simultaneously, you should promptly request the Office of Services for Students with Disabilities (OSEI) of the unit or campus for your need for modification or reasonable accommodation.

The student can obtain the application document from the Office of Services for Students with a Disability (OSEI), located on the third floor of the Dr. Guillermo Arbona Irizarry building, office B-349 (next to Medical Services for Students) and on the RCM's website in the Deanship of Students Portal. Students can also contact the Office through the email osei.rcm@upr.edu or by phone. The application does not exempt the student from fulfilling the academic requirements of the study programs.

Policy and Procedures for Handling Gender Discrimination Situations at the University of Puerto Rico

The Policy and Procedures for Handling Gender Discrimination Situations at the University of Puerto Rico, Certification 107 (2021-2022) Governing Board, ensures that the University of Puerto Rico, as an institution of higher education and workplace, protects the rights and provides a safe environment for all individuals who interact within it, including students, employees, contractors, or visitors. Its purpose is to promote an atmosphere of respect for diversity and the rights of members of the university community. The policy establishes a protocol for handling situations related to the following prohibited behaviors: discrimination based on sex, gender, pregnancy, sexual harassment, sexual violence, domestic violence, dating violence, and stalking, in both the workplace and academic settings.

It is the duty of every member of the university community to notify any discrimination or complaint event before the Office of Title IX, telephone 787-758-2525, ext. 1368 or 1360, or accessing the web page www.rcm.upr.edu/tituloix.

EDUCATION AND TRAINING BENEFITS FOR VETERANS

The school is approved by the Puerto Rico State Approving Agency to provide academic training to the students under the various GI Bill® programs. GI BILL® is a registered trademark of the U.S. Department of Veterans Affairs (VA).

UPR students who are veterans (as defined by the Veteran's Administration) of the United States Armed Forces can receive benefits under chapters 1606 – Montgomery GI Bill® Selected Reserve, CH. 30 – Montgomery GI Bill® Active Duty, CH. 35 – Survivor and Dependents Educational Assistance, CH. 31 – Veteran Readiness and Employment, CH. 33 – POST-9/11 GI Bill®, and Title 38 - United States Code Section 3679(e) School Compliance Form.

Law 203 Charter of Rights of the Puerto Rican Veterans of 2007 outlines the benefits that the Government of Puerto Rico gives to veterans who have served in the Armed Forces of the United States defending the principles of democracy. Beneficiaries of this law includes Veterans, children of a Veteran, or a Veteran's spouse.

Veteran In-State Tuition The following individuals shall be charged a rate of tuition not to exceed the in-state rate for tuition and fees purposes:

- A Veteran using educational assistance under either chapter 30 (Montgomery GI Bill®i -Active Duty Program) or chapter 33 (Post-9/11 GI Bill®4), of title 38, United States Code, who lives in Puerto Rico while attending a school located in Puerto Rico (regardless of his/her formal State of residence).
- Anyone using transferred Post-9/11 GI Bill®i benefits (38 U.S.C. § 3319) who lives in Puerto Rico while attending a school located in Puerto Rico (regardless of his/her formal State of residence).
- Anyone described above while he or she remains continuously enrolled (other than during regularly scheduled breaks between courses, semesters, or terms) at the same school.
- Anyone using benefits under the Marine Gunnery Sergeant John David Fry Scholarship (38 U.S.C. § 3311(b)(9)) who lives in Puerto Rico while attending a school located in Puerto Rico (regardless of his/her formal State of residence).
- Anyone using transferred Post-9/11 GI Bill®5 benefits (38 U.S.C. § 3319) who lives in Puerto Rico while attending a school located in Puerto Rico (regardless of his/her formal state of residence) and the transferor is a member of the uniformed service who is serving on active duty.
- Section 103, PL 115-407 prevents a school from penalizing the student while waiting for VA to make tuition and fee payments. The institution cannot deny a student access to classrooms, libraries or other institutional facilities. It cannot make the student borrow money to cover the cost while waiting for payment or charge a student a late fee or penalty. This applies to students benefiting from Chapter 31 or Chapter 33 of Post 9/11 GI Bill®.
- Protection begins with the student provides the school with a COE or a Statement of Benefit. The Institution can require the student to submit the COE or Statement of Benefits no later than the first day of the program and can also require the student a written request to use benefits or other necessary certifications. Protection ends when VA makes payment or 90 days after the date school certifies tuition and fees.

SCHOOL OF MEDICINE

Vision, Mission, and Institutional Values

The UPR School of Medicine vision is: to improve the quality of life in Puerto Rico and the global community through excellence, leadership and innovation in medical and biomedical education and research in a collaborative, diverse, equitable and inclusive learning environment.

The School's mission is ruled by four pillars: Academic and research innovation and success; student, resident, faculty, and staff support; operational resources and sustainability; and institutional services and outreach. The mission is:
to educate diverse, competent, and humane physicians, researchers, and biomedical scientists; conduct research that positively impacts education, science and health, to deliver integrated high-quality interdisciplinary healthcare services, including underserved populations and patients with complex care needs; and to provide expert consultation, community services and advocacy efforts for all sectors of society.

The School is committed to the following values:

- EXCELLENCE: The consistent pursuit of the highest quality performance in all academic endeavors.
- INTEGRITY: Commitment to honesty and ethical conduct in all processes and activities of the school of medicine.
- RESPECT: Achieving social interaction through the recognition and embracement of the rights, needs, and views of others.
- PROFESSIONALISM: The practice of competencies and behaviors governed by established standards in the performance of duties for the benefit of the individual and community being served.
- RESILIENCE: Ability to adapt and persist within challenging and uncertain situations and scenarios.
- INNOVATION: Increasing knowledge and transforming existing processes and models to better service changing needs and expectations.
- SOCIAL RESPONSIBILITY: The obligation to direct our educational, research and service activities towards addressing the health and social needs of our community following humanistic, diverse, equitable and inclusive principles.

The School has goals pertaining to the following strategic areas:

Academic and research innovation and success
Student, resident, faculty and staff support
Operational resources and sustainability
Institutional services and outreach

In the context of these vision, mission, values and goals, the faculty of the School of Medicine has the institutional responsibility of training medical professionals through its Doctor of Medicine Program, as well as training scientists through its master's and doctoral programs in Biomedical Sciences. It also offers continued educational experiences to physicians and the opportunity to keep abreast of their profession.

ORGANIZATION AND ADMINISTRATION

The Dean of Medicine exercises the administrative and academic authority within the School of Medicine. He/she is accountable to the Chancellor for the implementation of institutional policy, the academic programs, and campus administrative regulations.

The Liaison Committee on Medical Education accredits the School of Medicine since 1954. There are eighteen departments in the School of Medicine. The thirteen clinical departments are: Internal Medicine; Pediatrics; Surgery; Obstetrics and Gynecology; Psychiatry; Family Medicine; Pathology; Dermatology; Anesthesiology; Ophthalmology; Radiological Sciences; Physical Medicine, Rehabilitation and Sports Health; and Emergency Medicine. The five basic sciences departments are: Anatomy and Neurobiology; Biochemistry; Microbiology and Inmunology; Pharmacology and Toxicology; and Physiology.

The School's major affiliated clinical teaching facilities are the Adult University Hospital, the University Pediatric Hospital, the San Juan Veterans Administration Hospital, the Administración de Servicios Médicos de PR (ASEM), and the University of Puerto Rico Hospital at Carolina. Other affiliated clinical sites include, but are not limited to: San Juan City Hospital, San Jorge Children's Hospital, Pavía Hospital, Comprehensive Cancer Center, and Auxilio Mutuo Hospital in the San Juan Metropolitan Area; Mayagüez Medical Center, La Concepción Hospital, San Antonio Hospital, and the Perea Hospital located in the west coast of Puerto Rico; and Doctor's Center Hospital and the Manati Medical Center in the North Coast. New clinical sites may be made available throughout the year. In addition to these hospital teaching sites, the school is affiliated to various outpatient centers and clinics throughout the island.

The School offers Doctorate of Medicine, Doctorate of Philosophy, and Master of Science degrees. The School also oversees 19 postgraduate medical training programs and 18 subspecialties, all properly accredited by the Accreditation Council of Graduate Medical Education. The Doctor of Philosophy and Master of Science degrees are granted by the Graduate Programs of the Division of Biomedical Sciences. In addition, the School offers the following concurrent degree programs:

- MD-PhD UPR – Students spend their first two years at the medical school and begin their PhD studies upon completion of all second-year requirements of the MD program. After completing their PhD requirements, they return to the MD program. Upon completion of the MD program, they receive an MD and a PhD as separate degrees.

- MD-PhD UPR School of Medicine-Mayo Clinic–Students spend their first two years at the UPR School of Medicine and begin their PhD studies at Mayo Graduate School upon completion of all second-year requirements. After completing their PhD requirements, they return to the MD program. Upon completion of the MD program, they receive an MD and a PhD as separate degrees.

- MD-PhD UPR School of Medicine - University of Texas Health's Sciences Center at Houston and The University of Texas MD Anderson Cancer Center – Students spend their first three years at the UPR School of Medicine in the MD program. Upon completion of all third-year requirements, they begin their PhD program at The University of Texas Graduate School of Biomedical Sciences at Houston. Once they complete the PhD program, they return to the UPR School of Medicine for their fourth year of medical studies.

- MD-PhD UPR School of Medicine- Yale University School of Medicine and Graduate School of Arts and Sciences- Students spend their first three years at the UPR School of Medicine in the MD program and upon completion of all third-year requirements, they begin their PhD program at Yale Graduate School of Arts and Sciences. Once they complete the PhD program, they return to the UPR School of Medicine for their fourth year of medical studies.

- MD-JD UPR – Students spend their first two years at the UPR School of Medicine. Upon completion of all second-year requirements, they begin their law studies at the UPR School of Law. Students spend three (3) years in their JD degree. They return to the School of Medicine for their third year of medicine. Their fourth year is a mixture of MD and JD requirements. Upon completion of the MD program and JD

Program requirements students receive an MD and a JD as separate degrees. This program can also be pursued by beginning the JD program at the UPR School of Law first for three years, then completing three years at the UPR School of Medicine and the last year is a mixture of MD and JD requirements.

The administration of School of Medicine is located in the eighth floor of the Guillermo Arbona Irizarry Building at the Medical Sciences Campus.

Doctor of Medicine Degree Program

The curriculum of the program leading to the Doctor of Medicine degree is designed following the trends of modern medical education and takes into consideration the health needs of the community. It is divided into two major components: two years of required basic sciences (pre-clerkship phase) and two years of clinical clerkships and electives (clerkship phase). The basic sciences are taught in a clinically relevant format and during these years, students have early immersion in clinical encounters. The clinical component covers contents and skills deemed essential for every medical student regardless of background or ultimate career direction. The curriculum as a whole consists of a series of courses, clinical clerkships and learning experiences programmed sequentially and longitudinally in an integrated manner.

All courses are designed by the faculty of Medicine, with the approval of the appropriate Medicine Committee and the Curriculum Committee, and with the approval of governing bodies of the UPR System. Some courses are delivered by specific department faculty, e.g., Medical Histology; Fundamentals of Molecular Medicine; Human Physiology; Neurosciences; Medical Gross Anatomy and Embryology; Pathology and Introduction to Laboratory Medicine; Infectious Diseases; Introduction to Medical Pharmacology; Psychopathology and all clinical courses and clerkships. There are several courses delivered by an interdepartmental faculty, e.g., Human Development; Human Behavior; Mechanisms of Disease; Introduction to Clinical Skills; Basic Clinical Diagnosis; Neurosciences; Public Health; Fundamentals of Clinical Epidemiology and Evidence-Based Medicine; Integration Seminar I and II; Introduction to Principles of Clinical and Translational Research; Medical Ethics I, II, and III, and Ethical, Administrative, Legal and Economic Aspects of Population Health.

The Medicine I, Medicine II and Medicine III/IV Committees are responsible for reviewing the structure and content of the curricular offer within the academic year/level and its evaluation practices in their respective years/level. The Medicine Committees are advisory to the Curriculum Committee.

The Curriculum Committee is the institutional body that oversees the medical education program as a whole and has responsibility for the overall design, management, integration, evaluation, and enhancement of a coherent and coordinated medical curriculum. The Curriculum Committee analyzes the curricular program and the evaluation system throughout the four years of the MD Degree program. The Curriculum Committee has the empowerment to endorse changes to the curriculum and evaluation system and its implementation in the MD Degree Program, after approval of governing bodies of the UPR System. This committee is composed of administrative, faculty, and student representatives.

The Curriculum Office and the Office of Evaluation and Research in Medical Education, under the Office of the Associate Dean for Academic Affairs, also aid in the assessment and coordination of courses by offering input relevant to these processes and faculty support and development on teaching and assessment strategies.

At the fourth-year/level, a number of required hours must be completed through electives. This provides the opportunity to guide the student in choosing their career path. There is a wide variety of educational experiences to select that meet the needs of students according to their career goals and that broaden their clinical experiences. Students may take extramural electives for academic credit in accredited institutions, as per the school's policy.

Input from students and faculty is received regularly, particularly through evaluations at the end of each course or block. Regular and frequent Curriculum Committee meetings are scheduled throughout the year to evaluate the curriculum cross-sectionally as well as longitudinally. At the end of each academic year, students, faculty, and administrators meet to discuss and evaluate findings, as well as initiate changes and establish schedules for the next year at the annual Curriculum Retreat.

The school of medicine uses a wide variety of teaching methods that are adapted according to the content and educational objectives of the courses. During the pre-clerkship phase, the topics of biomedical and behavioral sciences are covered in a clinically relevant format through the use of self-directed learning experiences, active learning activities, small and large group discussions, computer simulations, clinical correlations, review sessions, and laboratory exercises. The Problem Based Learning modality facilitates the integration of basic and clinical science, ethical issues, and behavioral sciences concepts by means of the analysis of clinical cases. With the incorporation of active-learning experiences, the school aims to help students develop the skills of life-long learning, which are critical for the eventual independent, unsupervised practice of medicine.

The medicine program of the school of medicine is committed to ensuring that courses emphasize the preventive aspects of medicine and the socio-cultural determinants of health with an emphasis on the identification of strategies aimed at the elimination of health disparities. They also emphasize the importance of effective Inter-professional interactions and communications in order to ensure patient safety and minimize medical errors. Thus, ample exposure to hospitalized and ambulatory patients is offered during the clerkship phase. Students also become familiar with the secondary and tertiary levels of health care delivery.

MEDICAL COMPETENCIES AND EDUCATIONAL OBJECTIVES OF THE M.D. PROGRAM

The medical competencies and educational objectives of the M.D. program undergo periodical and systematic revision (every 4 years) in order to ensure that they reflect the school's mission and commitment to keeping up-to-date with national safety, health and educational trends. The school's competencies and objectives were last revised on May 2021.

Medical Competencies are as follows:

Patient Care:

The Patient Care competency domain encompasses the clinical skills of perform culturally sensitive medical interviewing, physical examinations, data gathering, oral presentations, written documentation, and diagnostic and therapeutic procedures essential for medical students to provide patient-centered health care.

Medical Knowledge:

The Medical Knowledge competency domain addresses the ability to obtain, maintain, and apply the knowledge necessary for patient care, including biomedical, clinical, psychosocial, and social behavioral sciences, along with skills in clinical problem-solving/critical thinking, diagnostic and therapeutic decision making for the management of medical problems using an evidence-based health care approach.

Practice-Based Learning & Improvement (PBLI)

The Practice-Based Learning and Improvement competency domain encompasses the knowledge and application of evidence-based medicine, and proficiency in information management, along with reflection, self-directed and life-long learning skills.

Interpersonal & Communication Skills

The Interpersonal, Communication and Interprofessional Collaboration Skills competency refers to establishing and maintaining an effective, honest, and respectful communication with patients and their families across a broad range of socioeconomic and cultural backgrounds; and demonstrating the
ability to engage in an interprofessional team in a manner that optimizes safe, effective patient- and population-centered care.

Professionalism

The Professionalism competency domain includes professional relationships with patients, peers and other health care providers, effective work habits, and adherence to ethical principles, including the compliance with relevant laws, policies, and regulations.

Systems-Based Practice & Health System Sciences (SBP-HSS)

The Systems-Based Practice & Health Systems Science competency domain encompasses an awareness of and responsiveness to the larger context and system of health care; the understanding of the structure of the healthcare delivery systems; and the application of the improvement sciences to optimize the quality and safety of patient care.

The student, prior to graduation, must demonstrate achievement of the following:

Knowledge of:

1. the normal and altered structure and function of the body and of each of its major organ systems
2. the physiological, molecular, biochemical, and cellular mechanisms that maintain homeostasis
3. the various etiologies and manifestations of diseases
4. the various principles that govern Health Promotion and Disease Prevention
5. application of the fundamentals of clinical research in establishing the etiologies of disease, establish a diagnosis and efficacy therapy
6. how to critically appraise the scientific and clinical evidence that underlie the treatment and care of individuals and populations
7. the available tools to engage in lifelong learning
8. the theories and principles that encompass ethical decision making and human values, and of the ethical dilemmas in medicine
9. how physical, psychological, sociological, cultural, economic, occupational and environmental processes contribute to disease etiology, health inequities and health care access.
10. population health, and global health
11. how to work effectively as a member of a health care team.
12. epidemiology of common maladies and strategies of reducing the incidence and prevalence of those maladies.
13. the structure and function of a variety of health care delivery systems.
14. the social, economic, ethical, medical and legal impacts of medical errors in today's practice
15. quality improvement processes that address and reduce system errors to ensure patient safety
16. the various approaches to the organization, financing, and delivery of health care
17. the most frequent clinical, laboratory, radiographic, and pathologic manifestations of common maladies
18. physical, psychological, ethical, social, and spiritual aspects of suffering including pain relief and palliative care

19. the diagnosis, prevention, appropriate reporting, and treatment of the medical consequences of common societal problems

Attitudes and Behaviors

1. Compassion and empathy in caring for patients
2. Integrity and honesty
3. Respect for the patient's autonomy, privacy and dignity
4. Awareness of limitations in knowledge and skills and a commitment to continuously and the capacity to continuously improve them, including integrating feedback.
5. Conducts patient-centered care that is respectful of patient's preferences, needs and values.
6. Recognizes and respects the roles of all healthcare professionals, ancillary personnel, and basic and clinical scientists.
7. Identifies the economic, psychological, occupational, social and cultural factors that contributes to the impairment of health.
8. Awareness of the human, physical and economical resources available for patient care.
9. Provides equal care for all patients regardless of race, gender, sexual preference, ethnicity, age, economic status, religious or political preferences.
10. Recognizes opportunities in patient encounters for advocating promotion of health and healthy lifestyles

Skills

1. Ability to obtain a culturally sensitive and accurate medical history, complete and focused, including issues related to age, gender, gender identity, sexuality and socio-economic status.
2. Ability to perform and interpret a complete and problem-specific physical examination including the mental status exam.
3. Ability to perform routine medical, diagnostic, and technical procedures with direct guidance.
4. Ability to use clinical reasoning to solve problems and to construct appropriate management strategies, including interpretation of commonly used diagnostic procedures and pharmacological therapies.
5. Ability to identify risk factors for disease or injury and to define the appropriate treatment strategies.
6. Ability to recognize and provide initial emergent management to patients including those with immediate life-threatening conditions.
7. Ability to communicate and educate effectively, both orally and in writing, with patients, families, colleagues, and others.
8. Ability to provide education on health promotion and healthy lifestyles.
9. Ability to exhibit tolerance towards the values and beliefs of patients, and respect to patient autonomy.
10. Ability for self-education.
11. Ability to work effectively as a member of an interdisciplinary health care team.
12. Ability to retrieve, manage and utilize Evidence-Based –Medicine for decision-making regarding patient care.
13. Ability to recognize and manage the threats posed by conflicts of interests involved in various arrangements for the practice of medicine.
14. Display clinical reasoning skills regarding patient care verbally and in writing.

RESEARCH AND CLINICAL ELECTIVES ABROAD

Medical students are allowed to take elective research courses and/or clerkships at other LCME accredited institutions. Students must obtain the approval of the Department Chair and of the Curriculum Office Director prior to submitting the application and registering. Upon completion of the clerkship, the host institution must

submit a student performance appraisal and report using the evaluation format of the University of Puerto Rico School of Medicine. Finally, these courses are submitted for credit/hours equivalent process in MSC.

VISITING STUDENTS

Students in good academic standing from Liaison Committee on Medical Education (LCME) accredited medical schools may be considered for any elective listed on the University of Puerto Rico School of Medicine's Fourth Year Manual and Electives Catalogue subject to space availability. Students from non- accredited Schools of Medicine by the LCME may be considered if complying with the same requisites and subject to space, for up to two months.

Details for aspiring visiting students may be found on the **Fourth Year Manual and Electives Catalogue**: http://md.rcm.upr.edu/curriculum/curriculum-office/.

Admission Requirements

The School of Medicine endorses the general policy of the Medical Sciences Campus in encouraging its applicants to seek the broadest cultural formation available prior to their training in the field of the health professions. Candidates are admitted to the freshman class on a competitive basis. The applicant must comply and present evidence of successful completion of the following requirements for admission:

Bachelor´s Degree in a college or university accredited by the Council of Higher Education or the corresponding U.S. accrediting agency.
Minimum general grade point average of 2.5, based on an A=4.00 scale, (includes all courses taken at college/university level).
Minimum science grade point average of 2.50, based on an A=4.00 scale, (includes all courses in Biology, Chemistry, Physics, and Mathematics taken at college/university level).
Total course work must include the following:

Course	Hours
General Chemistry	8 semester hours or 12 quarter hours
Organic Chemistry	8 semester hours or 12 quarter hours
Physics	8 semester hours or 12 quarter hours
Biology	8 semester hours or 12 quarter hours
Spanish	12 semester hours or 18 quarter hours
English	12 semester hours or 18 quarter hours
Behavioral and Social Sciences *Considered Courses: Society, Psychology, Political Sciences. Economics, Ethics or Anthropology*	12 semester hours or 18 quarter hours

Physics and Biology requirements are in addition to the basic introductory courses required at some colleges or universities. Basic introductory courses in the Physical and Biological Sciences may not be substituted for the credit hours stipulated above.

Six semester hours in advanced or honor courses in English and Spanish are acceptable to the Admissions Committee if approved with a grade of B or above per semester. This can substitute for the twelve semester hours required.

Basic introductory courses in the Social Sciences may not be substituted for the particular credit hours stipulated in this list as Behavioral and Social Sciences courses.

Courses included in the new MCAT content and are strongly recommended prior entering to the medical school: Biochemistry, Statistics, Genetics and Microbiology, as well as Psychology, Sociology, Histology, Anatomy or Anatomy and Physiology, Immunology, Embryology, and Human Development courses.
All academic requirements must be completed no later than the end of the second semester of the academic year preceding admission, excluding the summer session of that year. Admitted candidates will have their admission revoked if they fail to comply with this requirement.

Our curriculum is conducted in English and Spanish, and patient interactions are nearly always conducted in Spanish, therefore, demonstrated fluency in speaking, reading, and writing both languages is required. Applicants must select language courses that develop writing and reading comprehension skills.

Personal characteristics expected of applicants and evaluated through letters of recommendation and interviews are as follows:

a. Maturity
b. Motivation
c. Reliability
d. Creativity
e. Perseverance
f. Sensitivity towards others
g. Resiliency

Working knowledge in computers and their applications (computer literacy) is required, given the integration of computer technology in the medical curriculum.

The Medical College Admission Test (MCAT) must be taken not later than September 30 of the year before admission. An MCAT taken after that date will not be considered in the selection process for the entering class of a given year. The test will be valid for three (3) years (https: www.aamc.org/students/applying/mcat/).

APPLICATION PROCESS

American Medical College Application Service (AMCAS):
Applications to the School of Medicine are processed through the American Medical College Application Services (AMCAS), a centralized application service for applicants to first year classes at participating U.S. medical schools. The AMCAS application is only available via the AMCAS web site https://students-residents.aamc.org/applying-medical-school-amcas/applying-medical-school-amcas.

The complete application must be processed by AMCAS between June 1 and December 1st of the year preceding admission. The school urges candidates to submit the AMCAS Web application with enough time in order to be considered before December 1, the absolute deadline. DEADLINE EXTENSIONS WILL NOT BE GRANTED.

University of Puerto Rico - Medical Sciences Campus Supplementary Application:

In addition to the AMCAS application, all applicants who are permanent residents of Puerto Rico must complete and submit between the September 1st and December 1st deadline the University of Puerto Rico-Medical Sciences Campus Supplementary Application Form, along with a $30.00 non-refundable application fee. Payment

should be made by online or by check or money order payable to the University of Puerto Rico. If payment is made directly at the Collection Office; VISA, MasterCard, American Express, or ATH may also be used.

APPLICATION MAY BE REQUESTED AT THE FOLLOWING ADDRESS: https://solicitud.upr.edu/
APPLICATIONS SUBMITTED AFTER THE DECEMBER 1ST DEADLINE WILL NOT BE CONSIDERED. DEADLINE EXTENSIONS WILL NOT BE GRANTED.

Other Required Documents:

- One (1) complete official transcript from each college attended should be sent directly to the Central Office of Admissions no later than December 1 of the year prior to admission, the absolute deadline.
- One completed Pre-medical Evaluation Form from the Premedical Committee of the college of attendance or three recommendations from current professors to be sent directly to the Central Office of Admissions no later than the December 1 deadline. The school's official format designed for this purpose must be used https://md.rcm.upr.edu/download/md-recommendation-letter-form/.
- It is required that candidates have their portfolio by no later than December 1st of the year they are applying. This portfolio must include a Personal Statement and documents that evidence your participation in extracurricular activities (research, community service, leadership, shadowing, and scholarly activities). A candidate without a portfolio will not be interviewed. The document must be sent in PDF format and must be uploaded to the following link: https://webapps.md.rcm.upr.edu/mdadmissionletter/portfolio.html
- Once you receive an interview invitation, you must confirm by replying to the email with your interest within 48 hours of receipt, or the interview slot will be given to another candidate.
- In extraordinary cases, an additional official transcript including the current academic year's first semester grades can be requested by the admission officer to be evaluated and must be received before February 15 of the year in wish you are seeking admission.

PLEASE MAIL THE REQUIRED DOCUMENTS TO THE FOLLOWING ADDRESS:
CENTRAL ADMISSIONS OFFICE – MEDICINE I
UPR – MEDICAL SCIENCES CAMPUS
PO BOX 365067
SAN JUAN, PR 00936-5067

FAILURE TO COMPLY WITH ANY OF THE ABOVE-MENTIONED REQUIREMENTS AND DOCUMENTS BY THE ESTABLISHED DEADLINES WILL LEAD TO AN ADMINISTRATIVE REJECTION.

SELECTION CRITERIA

Since the University of Puerto Rico – School of Medicine is a state-supported institution, preference will be given to qualified applicants who are legal residents of Puerto Rico. Students that can establish legal residency will qualify for state tuition fees.

Highly qualified Puerto Rico non-residents must demonstrate strong ties to Puerto Rico. To determine strong residential ties to Puerto Rico, the Committee on Admission will review the applicant's birthplace, high school attended, college attended, and parent's legal residence. An applicant who meets two (2) of the four (4) categories demonstrates strong ties to Puerto Rico. Non-residents who demonstrate strong ties will be considered for out-of-state tuition fees.

Foreign applicants with an established legal residence in Puerto Rico will only be considered if, at

the time of application, they are either US citizens or have been granted a permanent resident VISA in the United States

The Admissions Committee of the School of Medicine will consider the following selection factors in screening qualified applicants, according to a formula established and approved by the Academic Senate of the Medical Sciences Campus.

1. Academic Performance will be determined by:

    - General and Science Grade Point Average
    - Bonus Points: Science, Mathematics (Calculus), Behavioral, and Social Sciences courses, in addition to the required ones, approved with a grade of B or higher.
    - Consistency in general grade point average-The number of withdrawals as evidenced in the official transcript.

2. Medical College Admission Test (MCAT):

    - All test areas of assessment will be taken into consideration.

3. Non-academic factors, expressed in numerical indices derived from two sources:

    - Recommendation from the Premedical Committee or three recommendations from current professors are required.
    - For extraordinary situations, refer to instructions for recommendation letters
    - After an initial screening of all other selection factors, the Admissions Committee will determine which candidates will be invited for a personal interview.

ACCEPTANCE

To guarantee enrollment upon acceptance, the candidate must pay a $100.00 non-refundable fee within 15 days of receipt of notice and send a written acknowledgement. The student must comply with the requirements specified in the letter of admission and abide by the recommendations of the Association of American Medical Colleges (AAMC) as stated in the current edition of the “Medical School Admission Requirements” book.

APPLICATION FOR ADMSSION TO ADVANCED STANDING
https://md.rcm.upr.edu/institutional-documents/?cp=2

The UPR School of Medicine will consider applications for transfer to the third year level from students who attend Liaison Committee on Medical Education accredited medical schools in Puerto Rico or mainland USA. Candidates must access the application for admission to advanced standing and follow the policies for application and selection to advanced standing for students from other Liaison Committee on Medical Education accredited medical schools. Candidates must consider the transfer credit equivalencies prior to application submission https://md.rcm.upr.edu/institutional-documents/?cp=2.

Technical Standards Requirements for Admission, Retention, Promotion, and Graduation.

The University of Puerto Rico School of Medicine is committed to educating diverse, competent, and humane physicians and researchers. Therefore, it is a great responsibility to select the best and most qualified candidates for medical school, as well as the development of a curricular experience that will allow these candidates to succeed and graduate as the best possible physicians.

Technical Standards are additional criteria beyond academic requirements like MCAT, GPA, and faculty letters. Compliance with these standards with or without reasonable accommodation is required for admission, retention, promotion, and graduation. To earn the MD degree, all candidates must demonstrate essential skills and aptitudes required for successful completion of the medical school curriculum in five key areas:

- Observation
- Communication
- Motor Function
- Intellectual-Conceptual, Integrative and Quantitative Abilities
- Behavioral, Emotional, Social Attributes and Professionalism

The UPRSOM is dedicated to the recruitment and education of students regardless of their gender identity, age, race, sexual orientation, religion, disability and functional diversity, or any other protected status. The objective is to achieve a medical professional population that reflects the demographic makeup of our island. The UPRSOM acknowledges Section 504 of the Rehabilitation Act of 1973, The American Disability Act (ADA) of 1990, and its congressional amendment of 2008. We are committed to providing educational opportunities for qualified students with disabilities and functional diversity and recognize their potential to excel as physicians. The technical standards aim to ensure that no qualified candidate with disabilities and functional diversity, is deterred from applying, as reasonable accommodations can facilitate the fulfillment of the complete curriculum. We encourage matriculants to disclose any disability and functional diversity, and request accommodation from the Office of Services for Students with Disabilities (OSEI) (osei.rcm@upr.edu, ext. 4006, 4002).

Policy

All applicants and medical students must meet both the academic standards and the technical standards to progress through the medical curriculum and ultimately graduate. Prospective applicants and current enrollees who have inquiries regarding their ability to fulfill the institution's technical standards should reach out to the Office for Student Affairs (Office A-873, Tel. 787-758-2525 Ext. 1810, 2045). Those who anticipate the need to seek reasonable accommodations to adhere to these standards are encouraged to contact the Office of Services for Students with Disabilities (OSEI) (osei.rcm@upr.edu, ext. 4006, 4002). Timely disclosure and requests by students are of the utmost importance, as accommodation is not applied retroactively and additional time may be needed to implement them.

The following abilities and characteristics are defined as technical standards and are requirements for admission, retention, promotion, and graduation.

OBSERVATIONAL SKILLS

Candidates for the MD program must be able to acquire different levels of information by using their senses and mental abilities, as presented through demonstrations and experiences in the learning environments. In the basic sciences, the medical students must be able to participate in activities, including but not limited to, laboratory exercises, histologic examination of specimens, and dissection of cadavers. In clinical sciences, the candidate must be able to perform a complete physical examination and analyze clinical data to develop a diagnostic and treatment plan.

COMMUNICATION SKILLS

Candidates must be able to quickly, clearly, effectively, and efficiently communicate and elicit information in both Spanish and English. Communication in both languages includes oral and written, not only with patients

and their families, but also with health care personnel, colleagues, faculty, staff, and all other individuals with whom they come in contact.

MOTOR FUNCTION

Following a period of comprehensive training, a candidate is expected to perform physical examinations and diagnostic maneuvers, exercising both general and emergency medical care in a timely manner. These tasks necessitate the coordination of gross and fine motor functions, physical mobility, and adherence to applicable safety standards, including universal precaution protocols.

INTELLECTUAL-CONCEPTUAL, INTEGRATIVE, AND QUANTITATIVE ABILITIES

Candidates must have ample and diverse cognitive (mental) abilities and appropriate studying techniques to assimilate the detailed and complex information presented in the didactic curriculum and clinical coursework; they must be able to do so in both remote and in person situations. Candidates must be able to adapt to different learning environments and modalities including, but not limited to, classroom lectures; small group, team, and collaborative activities; individual study; preparation and presentation of reports; use of medical technology; medical simulation; clinical encounters; coaching; and personal reflection. Candidates must be able to learn, participate, collaborate, and contribute as part of a team effectively. Candidates must be able to memorize, measure, calculate, reason, analyze, synthesize, and communicate their knowledge and reasoning. They must recognize and draw conclusions about three-dimensional spatial relationships and logical sequential relationships among events. They must be able to formulate and evaluate hypotheses consistent with the scientific method that enable effective and timely problem solving in diagnosis and treatment of patients in a variety of clinical modalities. They must be able to make timely, prudent, informed, and defensible decisions in the best interests of patients.

BEHAVIORAL, EMOTIONAL, AND SOCIAL ATTRIBUTES, AND PROFESSIONALISM

Candidates are required to demonstrate an elevated level of maturity and emotional stability to effectively leverage their intellectual capabilities. This includes exercising sound judgment and ensuring the timely completion of all duties associated with patient diagnosis and care. Maturity, motivation, reliability, creativity, perseverance, sensitivity towards others and resiliency are fundamental attributes expected of all candidates.

Furthermore, candidates are expected to possess a comprehensive understanding of the legal and ethical aspects inherent in medical practice and adhere to the established standards of the medical profession. Interactions with patients and their families, healthcare professionals, colleagues, faculty, and staff should consistently reflect courtesy, professionalism, and respect regardless of gender identity, age, race, sexual orientation, religion, disability and functional diversity, or any other protected status.

Candidates should actively contribute to collaborative and constructive learning environments, be open to receiving constructive feedback, and demonstrate a personal commitment to making positive changes when needed.

Physical and emotional endurance are essential traits for candidates, enabling them to withstand demanding workloads, perform competently and professionally in high-stress, fast-paced situations, and adapt to changing environments. Flexibility, along with the ability to manage uncertainties inherent to in-patient care and the healthcare system, is imperative. Candidates must not only accept responsibility for their own learning and actions, but also contribute to the overall well-being of the healthcare team.

All applicants will be asked to review these standards and to sign a form certifying they have read, understand and are able to meet all the Technical Standards of our School.

Any applicant or enrolled student who has a question regarding their ability to fulfill these standards and expectations is strongly recommended to contact the Office for Student Affairs (Office A-873, Tel. 787-758-2525 Ext. 1810, 2025).

Program of Studies

The School offers a highly dynamic curriculum that calls for frequent updates and revisions in core areas. This assures the up-to-datedness of the students' skills and knowledge upon graduation. Minimum Total Hours = 4,692. (Total hours may increase with additional hours in elective courses).

Accreditation

The School of Medicine MD Program is fully accredited by the Liaison Committee on Medical Education (LCME). Official correspondence to the LCME should be addressed to both LCME Secretaries (at each sponsoring association). Correspondence e-mailed to lcme@aamc.org will be distributed to both offices:

Association of American Medical Colleges 655 K Street, NW
Suite-100
Washington, DC 20001-2399
Phone: 202-828-0596

American Medical Association 330 North
Wabash Avenue Suite 39300
Chicago, IL 60611-5885
Phone: 312-464-4933

DOCTOR OF MEDICINE (M.D.) CURRICULUM
TOTAL MINIMUM HOURS: 4, 692

BASIC SCIENCE COMPONENT - FIRST AND SECOND LEVEL

First Level 891 – 1,079 Hours
Minimum Hours (905)

		Hours
MPRI 7117	Medical Histology	82-100
MPRI 7119	Fundamentals of Molecular Medicine	99-121
MPRI 7120	Human Physiology	144-176
MPRI 7127	Public Health, Preventive Medicine and Population Health	18-22
MPRI 7130	Integration Seminar I	54-66
MPRI 7136	Neurosciences	99-121
MPRI 7137	Human Behavior	45-55
MPRI 7138	Introduction to Clinical Skills	68-82
MPRI 7139	Human Development Course	68-82
MPRI 7140	Medical Gross Anatomy and Embryology	158-192
MPRI 7145	Medical Ethics: Constraints and Consequences I	16-18
MPRI 7155	Introduction to Principles of Clinical and Translational Research	40-44

Second Level 711-863 Hours
Minimum Hours (731)

		Hours
MSEG 7215	Pathology and Introduction to Laboratory Medicine	146-178
MSEG 7216	Infectious Diseases	126-154
MSEG 7217	Introduction to Medical Pharmacology	99-121
MSEG 7218	Basic Clinical Diagnosis	90-110
MSEG 7229	Psychopathology	36-44
MSEG 7230	Mechanisms of Disease	113-137
MSEG 7236	Integration Seminar II	49-59
MSEG 7237	Fundamentals of Clinical Epidemiology and Evidence-Based Medicine	36-44
MSEG 7245	Medical Ethics II: Critique and Methods	16

CLINICAL SCIENCE COMPONENT - THIRD AND FOURTH LEVEL

Third Level 1,360 – 2,280 Hours
Minimum Hours (1,720)

		Hours
MCUA 7437	Introduction to Clinical Physiatry	40-80
MTER 7310	Psychiatry	80-240
MTER 7316	Pediatrics Clerkship	320-480
MTER 7318	Obstetrics and Gynecology	160-320
MTER 7320	Introduction to Diagnostic Radiology and Nuclear Medicine	40-120
MTER 7325	Clinical Internal Medicine	400-560
MTER 7326	Surgical Clinical Internship	320-480
MTER 7438	Dermatology	40-80
MCUA 7418	Neurology	40-80

Fourth Level 604– 1296 Hours
Minimum Hours (416 + 320 of selective sub-internships) = 736

		Hours
MCUA 7427	Public Health	108-160
MCUA 7439	Ethical, Administrative, Legal and Economic Aspects of Population Health	40-60
MCUA 7440	Family Medicine Fourth Year Clerkship	80-240
MCUA 7445	Medical Ethics III: Ethical Consultation	16
	Elective Courses	**560
	Selective Sub-Internships	*320

***The First Selective Sub-Internship (160) must be completed in one of the following core areas courses:**

		Hours
MMED 7010	Clinical Clerkship in Medicine	80-240
MCIR 7010	General Surgery Sub Internship	80-240
MPSI 7010	Clerkship in Psychiatry (except at UPH)	80-240
MMED 7057	Emergency Medicine	80-240
MOBG 7010	Applied Obstetrics and Gynecology	80-240
MPED 7010	General Pediatrics	80-240
MMFA 7010	Clinical Clerkship in Family Medicine	80-240

If a student chooses to repeat one of these courses, credit will count toward their electives requirements.

***The Second Selective Sub-Internship (160) must be completed in a different course from the one chosen as First Sub-Internship. The student must select from one of the following courses:**

		Hours
MMED 7010	Clinical Clerkship in Medicine	80-240
MMED 7015	Clinical Diagnosis and Management of Cardiovascular Disease	80-160
MMED 7060	Geriatric Medicine Clerkship	80-160
MCIR 7010	General Surgery Sub Internship	80-240
MCIR 7004	Trauma Surgery Sub Internship	150-170
MPSI 7010	Clerkship in Psychiatry (except at UPH)	80-240
MMED 7057	Emergency Medicine	80-240
MOBG 7010	Applied Obstetrics and Gynecology	80-240
MPED 7010	General Pediatrics	80-240
MPED 7027	Pediatric Nephrology	160-480
MMFA 7010	Clinical Clerkship in Family Medicine	80-240
MCIR 7020	Clinical Neurosurgery	160-320
MCIR 7025	Clinical Urology	80-480
MCIR 7026	General Orthopedic Clerkship	80-480
MCIR 7028	Otorhinolaryngology Head and Neck Surgery	80-160
MCIR 7045	Inpatient Rehabilitation Clinical Rotation	80-160
MMED 7001	Clerkship in Hematology and Oncology	160

If a student chooses to repeat one of these courses, credit will count toward their electives requirements.

***The student may select a course from a list of courses approved by the Curriculum Committee as their Selective Junior. These courses include: Clinical Clerkship in Family Medicine; Applied Obstetrics and

Gynecology; General Pediatrics; Clerkship in Psychiatry; General Surgery Sub Internship; Trauma Surgery Sub Internship; Emergency Medicine. Students may take these courses more than once, but only one will count toward their Selective Junior requirements. If a student chooses to repeat one of these courses, credit will count toward their elective requirements. This also applies to the Required Internal Medicine Junior Clerkship.

****Minimum hours required for electives courses; students can start taking elective courses once they have completed the first level of studies and are in good academic standing.**

POSTGRADUATE CLINICAL TRAINING PROGRAMS

The University of Puerto Rico has a long tradition of post-graduate training in nearly all of the medical and surgical specialties and subspecialties. The School of Medicine sponsors thirty-seven (37) residency and fellowship programs at the University District Hospital (UDH), the University Pediatric Hospital (UPH), and the University of Puerto Rico Hospital in Carolina.

To be eligible for a residency/fellowship position in any of the ACGME accredited programs of the University of Puerto Rico School of Medicine, the applicant must comply with the following requirements, based on the applicable category:

Graduates of Medical Schools accredited by the Liaison Committee on Medical Education (LCME):

1. Complete the National Residency Matching Program (NRMP) application form
2. Complete ERAS application form
3. Submit official transcript of credits from pre-medical studies
4. Submit official transcript of credits from the medical school
5. Submit a Dean's letter that must include your academic ranking in terms of the group and personal qualifications
6. Submit two letters of recommendation
7. Official evidence of approval of the USMLE Step 1 (most Programs also require evidence of USMLE Step 2 CK).
8. Be fully bilingual in English and Spanish

Graduates of foreign medical schools not accredited by the LCME:

1. Complete the National Residency Matching Program (NRMP) application form
2. Complete ERAS application form
3. Submit official transcript of credits from pre-medical studies
4. Submit official transcript of credits from the medical school
5. Submit a Dean's letter that must include your academic ranking in terms of the group and personal qualifications
6. Submit two letters of recommendation
7. Official evidence of approval of USMLE Step 1 and Step 2 CK.
8. Be fully bilingual in English and Spanish
9. Copy of a valid ECFMG certificate
10. Official copy of the medical school diploma

The School of Medicine participates in the National Residency Matching Program (San Francisco Match and Urology Match). Each accredited residency/fellowship program is expected to select its candidates through these matching programs.

The office for Graduate Medical Education is located at the eight floor of the Guillermo Arbona Irizarry Building, Medical Sciences Campus at the office A-877.

Accredited Residency Programs:

- Anesthesiology
- Dermatology
- Emergency Medicine
- Family Medicine
    - Geriatrics Family Medicine
- General Surgery
    - Orthopedic Surgery
    - Otolaryngology
    - Urology
- Internal Medicine
    - Allergy and Immunology
    - Cardiology
    - Endocrinology
    - Gastroenterology
    - Geriatrics, Internal Medicine
    - Hematology/Oncology
    - Infectious Diseases
    - Nephrology
    - Rheumatology
- Neurology
    - Neuromuscular Diseases
    - Pediatric Neurology
- Med/Ped
- Obstetrics and Gynecology
- Ophthalmology
- Pathology
    - Forensic Pathology
- Pediatrics
    - Pediatric Critical Care
    - Neonatology-Perinatal Medicine
- Physical Medicine and Rehabilitation
    - Sports Medicine
- General Psychiatry
    - Child and Adolescent Psychiatry
- Radiology
- Nuclear Medicine
- Transitional Year

Any other information please contact the Deanship of Graduate Medical Education at the following address:

Graduate Medical Education Office
Suite A 877
School of Medicine-Medical Sciences Campus, UPR
P.O. Box 365067, San Juan, Puerto Rico 00936-5067 (787) 758-2525 ext. 1386/1256

Course Descriptions

DOCTOR OF MEDICINE (MD) PROGRAM

MANE 7010 - Introduction to Anesthesiology and Resuscitation. Eighty to one hundred and sixty (80-160) hours.
The course consists about multiple aspects of the subspecialty and, in particular, about the application of acquire skills and knowledge in the care of critically ill patient. The student will be able to acquire basic knowledge as to the preoperative evaluation, intraoperative care, postoperative care of surgical patients. He/she will also acquire knowledge on the use of anesthetic adjustments and about different techniques used in anesthesiology. Special emphasis will be made in the development of skills geared to manage the respiratory trait and resuscitation techniques. This will be offered by way of lectures, demonstrations, and practical exercises in the operative room.

MANE 7015 - Introduction to Postoperative Intensive Care. Eighty to one hundred and sixty (80-160) hours.
The student will be able to acquire knowledge and skills about the management of acute complications that may occur during the immediate post-surgical period, by means of lectures, demonstrations and clinical experiences. The student will also have the opportunity to learn monitoring techniques and the management of problems related to the administration of liquids and acid- base and electrolytic balance.

MANE 7105 - Research in Anesthesiology. One hundred and sixty to one hundred and ninety-two (160-192) hours. Pre-requisites: First Level of Medicine (First Year).
During this course, the student will have the opportunity to develop research skills through its various steps. Student will participate in an ongoing research or will participate in the development of a new one. Some of the research skills to be developed are: research question, literature revision, design of data gathering sheets, statistical design, data analysis, and proposal redaction, among others. Students will also have the opportunity to integrate, from clinical perspective, acquired knowledge during their First Year in Medicine. Oral presentation will be required at the end of the course.

MCBI 7001 - Research Introduction to Basic and Clinical Sciences. One hundred and sixty to two hundred and forty (160-240) hours. Pre-requisites: Medicine I, Grade Average of 2.50 or more and not having any pending Reposition or Remedial Course.
This course in Basic Clinical Research will allow participation of the student in active research projects carried out in the School of Medicine. These are: Research in Pediatric and Adult AIDS, Molecular Parasitology, Cell Communication, Vascular Alterations and Cardiovascular Disease, Mechanisms of Drug Resistance in Bacteria and Malaria, Diabetes, Hereditary Disease, Cancer, etc. The student will be trained in the activities associated with the conduct of scientific research such as the objectives, significance and scientific background of the project, experimental design, methodology, and analysis of results. The students will participate in one or more of the developmental phases of the research project, they choose.

MCBI 7002 - Research in Basic and Clinical Sciences. One hundred and sixty to two hundred and forty (160-240) hours. Pre-requisites: MCBI 7001 or equivalent, Medicine I, Grade Average of 2.50 or more and not having any pending Reposition or Remedial Course.
This course in Basic and Clinical Research will allow direct participation of the student in active research projects carried out in the School of Medicine. There are research in Pediatric and Adult AIDS, Molecular Parasitology, Cell Communication, Vascular Alterations and Cardiovascular Disease, Mechanisms of Drug Resistance in Bacteria and Malaria, Diabetes, Hereditary Diseases, Cancer, etc. This second course is designed to provide the student with a broader experience in research. The student(s) will have a more active role in the direction of the research project. This will be achieved through the continuation of the project initiated in the previous course or through their integration into an existing formal research project.

MCBI 7003 - Advanced Research in Basic and Clinical Sciences. One hundred and sixty to two hundred and forty (160-240) hours. Pre-requisites: MCBI 7001, MCBI 7002 or equivalents, Grade Average of 2.50 or more and not having pending Repositions or Remedial Courses.
This course in Basic and Clinical Research will allow direct participation of the student in active research projects carried out in the School of Medicine. There are research in Pediatric and Adult AIDS, Molecular Parasitology, Cell Communication, Vascular Alterations and Cardiovascular Disease, Mechanisms of Drug Resistance in Bacteria and Malaria, Diabetes, Cancer, etc. In this third research course, is intended that the student(s) will complete the research initiated during the previous two courses. It is expected that the student(s) analyze their experimental results, present a final written report, and present the data in a scientific meeting. The completion of these three research courses will qualify the student(s) for a formal recognition of their research trajectory during their class graduation ceremony.

MCIR 7001 - Introduction to Surgery. Eighty (80) hours. Pre-requisite: MCIR 7010.
Throughout the course, the medical students who are on their second semester of their fourth year of medicine, and had been accepted on a general surgery residency training program, will receive an introduction to basic knowledge and skills under the surgical field that will make them feel more prepared to deal with the challenges expected for anyone undergoing training in general surgery, specially during the beginning of it.

MCIR 7002 - Endocrine Surgery: Eighty (80) hours. Pre-requisite: Third Year Clerkship of Internal Medicine, Surgery and Radiology.
Development of clinical skills for evaluation (history and physical, work up) and management (treatment plan, intra and postoperative experience) and follow up both short and long term of the following conditions: thyroid (nodules, function disorders, goiter and cancer), parathyroids, adrenals (masses, function disorders and malignancy), endocrine pancreas and genetical disorders. The student will participate in the outpatient clinics, operating room and hospital ward. The student will also participate in multidisciplinary conferences and the didactic sessions of the Department of Surgery. During the course a peer reviewed article will be discussed to develop the competence of Problem Based Learning. All competences regarding professionalism will receive emphasis such as ethics, communication skills with colleagues and teamwork.

MCIR 7003 – Palliative Care: Eighty (80) hours. Pre-requisite: Third Year Clerkship Surgery (MTER 7326)
The Palliative Medicine course is aimed at fourth year medical students to acquire and reinforce skills related to the management of patients with serious illness and terminal conditions, including the development of communication techniques and end-of-life management. The student will be part of the interdisciplinary team that conducts consultations at the Trauma Hospital to establish treatment goals based on the patient's prognosis. The course consists of didactic, clinical and independent study components. This course will be delivered in face to face modality.

MCIR 7004 - Trauma Surgery Sub Internship. One hundred and fifty to one hundred and seventy (150-170) hours. Pre-requisite: MTER 7326.
The Fourth Year Trauma Surgery Clerkship has a duration of 4 weeks. The student will be a member of the trauma and critical care surgery service. He/she will spend a week in the ER with the day team, a week at the ER with the night team, and two weeks in the trauma intensive care unit. The student will be exposed to the initial assessment and subsequent management of the polytraumatized patient. The student will be exposed to the pre, intra, and post-operative management of trauma surgical patients. If the patient is severely injured and requires intensive care unit management the student will be involved in the overall management of this critically ill patient.

MCIR 7005 – Research in Neurosurgery. One hundred sixty to three hundred and twenty (160-320) hours. Pre-requisite: First year approved of the Doctor of Medicine program.
This is an elective course aimed at students of the Doctor of Medicine Program, designed to expose the student to the research process in the area of neurosurgery. This might comprise both the area of general neurosurgery and subspecialties (e.g. pediatric neurosurgery, spine surgery, endovascular neurosurgery, critical care). During the course, the student will have the opportunity to participate in all or several of the research processes that may include the creation of a research question, development of a proposal, literature review, data collection, data analysis, preparation of a manuscript and/ or dissemination of results to the scientific community.

MCIR 7010 - General Surgery Sub Internship. Eighty to two hundred and forty (80-240) hours.
The Fourth Year Surgery Clerkship has a duration of 4 to 8 weeks. This course aims to familiarize the fourth-year medical student with the practice of general clinical surgery. He/she will work in one of the four departmental services. The student will be assigned no more than four patients per week, to take a medical history and perform a physical examination within the first 24 hours following admission. The student will be exposed to the pre, intra and post-operative management of surgical patients. The student is expected to have a comprehensive overview of the core general surgery areas, with emphasis on the clinical knowledge.

MCIR 7017 - Pediatric Surgery. One hundred and sixty to three hundred and twenty (160-320) hours.
The student will have the opportunity to become a member of the surgical pediatric service of the Children Hospital. He/she will participate in the evaluation and management of surgical conditions on children. These will include: surgical emergencies on neonates, tumors, traumas and congenital cardiovascular anomalies. Student will perform night duties every four nights under the supervision of the resident in-charge.

MCIR 7018 - Cancer Surgery. One hundred and sixty (160) hours.
The composition of the Cancer Program for this elective course consists of TGR, TPO, Tumor Clinics, Breast Clinic, Head/Neck Clinic, Cancer Detection and Demonstration, and WTC. Other activities to be attended are: Cancer Seminar, Cancer Journal Club, Cancer Conferences and procedures at the operating room.

MCIR 7020 - Clinical Neurosurgery. One hundred and sixty to three hundred and twenty (160-320) hours.
This course is geared to familiarize the student to the different neurologic conditions amenable to surgery. He/she will have the opportunity to examine and participate in the treatment of ambulatory and hospitalized patients, will perform daily visits with residents and faculty; will attend weekly seminars and combined lectures on Neurosurgery, Neurology and Neuroradiology, as well as attend to surgical procedures.

MCIR 7025 - Clinical Urology. Eighty to four hundred and eighty (80-480) hours.
The course aims to familiarize the student with the symptoms and physical findings of the most of the urologic conditions. He/she also acquire basic knowledge as to interpretation and performances of minor urologic procedures. The student also will be acquainted with the diagnosis, classification and treatment of the most common tumors in the genitourinary tract.

MCIR 7026 - General Orthopedic Clerkship. Eighty to four hundred and eighty (80-480) hours.
This course consists of evaluations of patients at emergency, ambulatory and hospital settings. Weekly lectures on basic sciences, journal club meetings and daily ward rounds to hospitalized patients will be held. The student will become acquainted with situations such as; trauma, and degenerative disease of the extremities, occurring in population, children and adults.

MCIR 7028 - Otorhinolaryngology Head and Neck Surgery. Eighty to one hundred and sixty (80-160) hours.
The student will participate in all the activities held at the selection under supervision of faculty staff and

residents. This includes working at OPD, or, Ward and Emergency Room. He/she will be exposed to all aspects of the specialty.

MCIR 7029 - Transplant Surgery and Immunology. One hundred and sixty to three hundred and twenty (160-320) hours.
1) The student will be exposed to a specialty, which comprises medical, immunological, and surgical aspects of clinical transplantation. 2) He/she will be familiarized with the indications and selection process of kidney transplant recipients with end stage renal disease as well as the evaluation and selection of living related donors and cadaver donors. 3) He/she will be exposed to the immunological identification, selection, and preparation of these patients including concepts of Histocompatibility. 4) He/she will be exposed to the pre, intra, and post-operative management of these patients as well management of all medical and immunological complications. 5) He/she will be exposed to the immunosuppressive management to prevent and treat graft rejection. 6) The student will be assigned to the transplant ward with the supervision of the transplant surgeon and transplant nephrologist.

MCIR 7030 - Clinical Nutritional Support. Eighty to one hundred and sixty (80-160) hours.
1) The student will participate in rounds with the tending physician three times a week. 2) Will evaluate the consult to the service and discuss it with the attending. 3) Through a series of conferences, selected readings and lectures the student will be more able to cope with the multiple problems in the selection and management of the complications of nutrition (enteral and parenteral) in critically ill patients. According to the interest of the student, he will participate in some of the research or studies running at the service.

MCIR 7035 - Thoracic and Cardiovascular Surgery. One hundred and sixty (160) hours.
This elective is designed to familiarize the student with the day-to-day management of patients suffering from cardiovascular diseases. During the rotation, he/she will work as Junior Intern under the supervision of the Resident and Attending Staff. He/she will share the responsibilities and privileges of management of patient with a wide variety of disorders.

MCIR 7036 - Topics in Sports Health and Exercise Sciences. Eighty to one hundred and sixty (80-160) hours.
This is an elective course designed to present and discuss the interdisciplinary nature of this field. The students will have the opportunity to participate in clinical, educational and research activities in the following areas: Primary Care Services in the Physically Active Individual: Sports Traumatology and Rehabilitation: Biostatistics and Computing, Exercises Physiology and Biopsychosocial Aspects of Sports.

MCIR 7045 - Inpatient Rehabilitation Clinical Rotation. Eighty to one hundred and sixty (80-160) hours. Pre-requisites: MTER 7316, MTER 7325, MTER 7326
This course aims to expose medical students to the medical care of hospitalize patients with acute acquired disabilities such as: patients with stroke, spinal cord injuries, orthopedic injuries, neurological and traumatic brain injuries. This rotation will give the student the opportunity to recognize and manage these medical issues. In addition, this rotation will give the student the opportunity to be an integral part of a multidisciplinary team.

MCIR 7055 - Quality Assurance and Total Quality Management in the Emergency Department. One hundred and sixty to three hundred and twenty (160-320) hours.
This course is designed to introduce students to one of the administrative aspects of the practice of Medicine, in particular Emergency Medicine. It is meant to give students an overview of the tools available to help us ensure quality medical care. This involves the identification of a situation needing attention. The process involved in that situation is then analyzed. The process is broken down into its components. These components are then studied in order to identify which could be improved. A corrective plan is then devised

and implemented. Finally, the effectiveness of such plan is evaluated and the project then closed or redirected.

MCUA 7418 - Neurology. Forty to eighty (40-80) hours. Prerequisite: Second year of Medicine
Through lectures, case presentations and seminars this course is designed to enable the student recognize neurological signs and symptoms and acquire pertinent knowledge in reference to diagnostic procedures available at present in the diagnosis of neurological problems. The course also aims to enable the student to learn the basic management of patients with neurological diseases.

MCUA 7427 - Public Health. One hundred and eight to one hundred and sixty (108-160) hours.
Three weeks course in preventive medicine and public health. During this course, the student develops and improves research, knowledge and skills in public health and community oriented primary care. Students will analyze the health status of a community through investigation of a health program in the community.

MCUA 7437 - Introduction to Clinical Physiatry. Forty to eighty (40-80) hours. Pre-requisites: Second-Year of Medicine.
In this course of Clinical Physiatry, the medical student should be introduced to basic concepts and clinical experiences in the field of rehabilitation medicine, through the academic Program of Physical Medicine and Rehabilitation, everything that is related to clinical management in the field of Physical Medicine and Rehabilitation and the evaluation of neuromusculoskeletal and cardio-respiratory conditions. The student should have clinical experiences with patient in a wide range of age, from pediatric to geriatric; acute, subacute and chronic conditions at institutions of acute care and rehabilitation centers. In addition, the students will have the opportunity to participate on workshops, where can observe, and then participate in the performance and interpretation of electrodiagnostic and exercises tests.

MCUA 7439 - Ethical, Administrative, Legal and Economic Aspects of Population Health. Forty to sixty (40-60) hours. Pre-requisites: 1st, 2nd, and 3rd Year of Medicine approved.
The purpose of this course is to integrate the four years of Medical School and the Residency years giving emphasis to topics of population health, health systems and ethical, economic, legal and administrative aspects pertinent to a doctor's daily work. It is expected that students will apply the knowledge and skills about population health aspects acquired in this course to their professional practices. The following topics will be included: world health care systems, Puerto Rico health care system, United States health care system, EMTALA Law, HIPAA Law, prevalence and prevention of common diseases, legal and ethical aspects of the medical record, and legal aspects pertinent to palliative care. Grading System: Passed (P), Not Passed (NP)

MCUA 7440 - Family Medicine Fourth Year Clerkship. Eighty to two hundred and forty (80-240) hours. Pre-requisites: Medicine Third Level courses.
This course provides students a comprehensive experience in family medicine. The course will expose students to the theoretical body and development of Family Medicine Specialty. In addition, evaluation and management of the most common health problems in family medicine, primarily oriented to ambulatory care, will be discussed. Students will also familiarize with family work skills and with the basic concepts of health promotion and disease prevention. Students will participate in the delivery of services in an interdisciplinary team.

MCUA 7445 - Medical Ethics III: Ethical Consultation. Sixteen (16) hours. Pre-requisites: MPRI 7145, MSEG7245.
This course aims to develop in students, through guided self-learning experience, the ability to acquire the competencies required to engage with a patient from a health care ethics consultation perspective. This approach emphasizes the distinctive role of responding to specific ethical concerns and questions that arise at the bedside. A detailed Consultation Report will be required. Grading System: Passed (P), Failed (F)

MDAA 7006 - Independent Study for United States Medical Licensing Exam (USMLE) - Step I. Zero (0) hours. Pre-requisites: Medicine I, Medicine II.
A course designed for students who delay taking the USMLE Step I exam beyond the deadline established by the Deanship for Academic Affairs of the School of Medicine and/or who have not passed said exam. The coordinator will assign a professor to each student. The student will meet with the professor: to establish together a follow-up plan in order to monitor the student's progress; to analyze together the student's areas of strength and weakness; and to design a self-study program for the USMLE Step I considering the student's individual learning style and incorporating resources and materials from the previous courses of medicine, and any other material they think will be useful for this purpose. The student shall be responsible for the self-study of this material and for complying with the established follow-up plan. The student will take the exam as soon as he/she feels prepared, taking into account the established norms, policies, and recommendations on student promotions.

MDER 7010 - Dermatology in Everyday Practice. Eighty to one hundred and sixty (80-160) hours.
The student will interview and examine patients. The most common dermatologic conditions seen on daily practice will be emphasized. He/she will participate in all educational activities held at the department and attend to Dermatology Clinics.

MDER 7015 - Clinical Investigation in Dermatology. One hundred and sixty (160) hours.
During this course, the student will be assigned a special clinical project. It is expected that he/she will make use of different methods on Immunopathology, Microbiology, Epidemiology and other advanced techniques while working in the project.

MEMR 7010 - Principles of Emergency Medicine. Eighty (80) hours. Pre-requisites: First Year of Medicine.
The course involves a series of lectures, skill stations and ambulance runs. The lecture topics include Basic Approach, Shock, Trauma, Toxicology and Cardio-Pulmonary Problems. The skill stations include Suture Lab, Intubation Skills, Immobilization Techniques, Arrhythmia Recognition, Gastric Lavage and Intravenous Techniques. The student will have two ambulance runs to be expose to our prehospital care system.

MEXT 7000 - Out of State Elective Course. Eighty to four hundred and eighty (80-480) hours.
Clinical or research experiences conducted in out of state accredited institutions. Experiences may be taken in any of the clinical fields.

MFIS 7015 - Methods in Neurobiology Research. Eighty to one hundred and sixty (80-160) hours.
The course will expose the student to the different techniques used in Neurobiology including Electrophysiology, Histology, Electron Microscopy and Tissue Culture. It includes demonstrations, theory and independent study.

MFIS 7018 - Research Program in Physiology I. Eighty to three hundred and twenty (80-320) hours.
This course involves direct participation in a research program in Physiology, including development of protocols, experimentation, laboratory analyses, data handling, statistical analysis and literature review. Possible review areas include: Cell Physiology, Tissue O2 Transport, Nervous System Development, Electrophysiology, Actions of Pituitary Peptides, Fluid Homeostasis and Renal Hormones.

MISH 7005 - Community-Based Primary Medicine Experience. Eighty to one hundred and sixty (80-160) hours. Pre-requisites: Medicine I courses.
The course is a multidisciplinary clinical experience. Participants are expected to spend between 2 to 4 weeks at a community health center or community-based service organization located in any special community. The community center or service organization must provide the basic health services. The goal of this course is to offer participants the opportunity to increase experience in ambulatory primary care health services and

for multidisciplinary services as well. The course is based on an apprenticeship model in which the learner benefits from the knowledge and experience of a senior physician and the health center staff and their willingness to share patients and community health related activities.

MISH 7010 - Research Seminar: Hispanic Health Issues. One hundred and sixty to three hundred and twenty (160-320) hours.
Independent study of a particular problem or issue related to Hispanic Health in U.S. and compare with Puerto Ricans in the island. The study will require extensive review of the literature. The student will meet regularly with the professor in charge to present progress reports. This process will end with the submission of a manuscript for possible publication. The student will conduct a descriptive/documentary research. This type of research requires analysis of government documents, related literature, and research papers, among others. The focus of descriptive studies may include prevalent practices, points of view, and processes and tendencies of a given area of study. The analysis consists in comparing, contrasting, classifying, and interpretation of collected information and data. Parametric statistical analysis is excluded of descriptive research. Significant and innovative conclusions and approaches based on documentary analysis are expected.

MISH 7017 - Instructional and Evaluation Strategies in Medical Education. Forty to eighty (40-80) hours. Pre-requisites: First, Second, and Third Year of Medicine approved.
This course is designed to develop knowledge and skills in medical education in 4th Year medical students. It focuses on the longitudinal development of students in the areas of Evidence-Based Medicine and Problem-Based Learning. Through lectures, workshops, and supervised practice, students will develop small group teaching skills, seminar facilitation, and preparation of didactic materials related to the Clinical Epidemiology knowledge that underlies the practice of Evidence-Based Medicine. Together with the didactic sessions, this course will have a practical component, which will be provided by the Integration Seminar 1 course that is offered to 1st Year medical students. The course coordinator, with the collaboration of other faculty members, will supervise students' performance.

MISH 7025 - Clinical Observation Experiences (Shadowing) for Medicine Students. Forty to eighty (40-80) hours.
This course is intended for medical students who are in the process of selecting a medical specialty. Students are exposed to a variety of activities in different clinical scenarios in a shadowing experience, limited specifically on watching the physician as he/she performs his or her duties. It serves the purpose of exposing students to the various medical specialties available, especially to those to which they are not exposed to as part of the formal curriculum of the program of Doctor in Medicine, in order to guide them in the selection of a medical specialty. Students will not be allowed to engage in any activity that is considered the practice of medicine such as, but not limited to: medical diagnosis, ordering or administration medications, carrying out invasive or non-invasive procedures (i.e.: suturing, wound cleaning, vaccine administration, etc.), patient counseling or education, or any type of communication traditionally attributed to the patient-physician relationship. Grading system: Passed (P), Not Passed (NP)

MISH 7100-Peer to Peer in Medical Education. Forty to eighty (40-80) hours. Pre-Requisite: First Year of Medicine approved.
This course is designed to develop knowledge and skills in medical education in medical students. It focuses on the longitudinal development of students in the areas of evidence-based medicine and problem-based learning. Through lectures, workshops, and supervised practice, students will develop small group teaching skills, group facilitation, and preparation of didactic materials related to the required course in the Medical Curriculum. Together with the didactic sessions, this course will have a practical component, which will be provided in different required courses of the School of Medicine, all by under supervision of the required

course director and in alignment with the course objectives. Students' performance will be supervised by the Course Director, and Mentored by the Peer to Peer director, with the collaboration of other faculty members.

MISH 7995 - Service Learning Experience. Eighty to one hundred and sixty (80-160) hours. Pre-requisites: Have approved the first level of studies of the Doctor of Medicine Program.
This elective course will give the student the opportunity to provide service through UPR-RCM Community Service Programs or UPR-RCM affiliated non-profit community organizations activities. The student will also learn about the context in which the service is provided; the connection between the service and their academic coursework, and their roles as health professionals. Students will be required to spend between 80 to 160 hours through the academic year, working with an assigned supervisor. The supervisor may well be a medical social worker, a head nurse, a health educator, or any other health professional working with the UPR-RCM Community Service Programs or UPR-RCM affiliated non-profit organizations designated by the program or institution director. Emphasis will be placed on health disparities and socio-cultural issues student's reflections, and proven knowledge, skills, behavior and attitude toward the course-required activities.

MMED 7001 - Clerkship in Hematology and Oncology. One hundred and sixty (160) hours. Pre-requisite: Third Year of Medicine.
The Hematology and Oncology Clerkship is a rotation that will expose the medical student to the inpatient, and consultation service in the care of patients with hematologic and oncologic diseases. During the clerkship, the medical student will participate in the process of diagnosis, treatment and management of complications of patients. He/she will perform and observe procedures related to the practice of hematology and oncology.

MMED 7002 - Research in Internal Medicine. One hundred and sixty (160) hours. Pre-requisite: First Year of Medicine.
The elective course on Research in Internal Medicine is designed to expose the medical student to the process of research in the field of internal medicine, including general internal medicine and its subspecialties (allergy and immunology, cardiology, endocrinology, gastroenterology, geriatrics, hematology and medical oncology, infectious diseases, nephrology, pneumology and critical care, and rheumatology), neurology and translational research applied to precision medicine through omics. During the elective course, the medical students will participate in all or several of the steps of the development of a research question, elaboration of a research proposal, completion of a literature review, data, data analysis and interpretation, preparation of a manuscript and/or presentation of results to the scientific community.

MMED 7010 - Clinical Clerkship in Medicine. Eighty to two hundred and forty (80-240) hours.
This is a clinical experience held at the Department of Medicine, University District Hospital or at any other hospital of the consortium of the School of Medicine. The student will work assigned patients; medical history, physical examination, clinical conclusions and manage the patient under supervision. It is expected that he/she attend all educational activities offered during the clerkship.

MMED 7015 - Clinical Diagnosis and Management of Cardiovascular Disease. Eighty to one hundred and sixty (80-160) hours.
The student will work with cardiovascular patients and help in their management, under supervision. Will attend educational activities and cardiovascular procedures held at the University District Hospital.

MMED 7016 - Cardiology and Electrocardiography. One hundred and sixty (160) hours.
The student will attend consultation of vascular patients, under supervision. He/she will be acquainted with electrocardiography interpretations. Will attend activities held at the Cardiology Section at Mayagüez Medical Center.

MMED 7018 - Cardiovascular Diseases. One hundred and sixty (160) hours.
The student will attend cardiovascular patients and help in their management, under supervision. Will attend the educational activities and cardiovascular procedures held at the San Juan City Municipal Hospital.

MMED 7020 - Coronary Care Unit. Eighty to one hundred and sixty (80-160) hours.
The student will work on patients with coronary heart disease and will learn from the different clinical variations that they present. He/she will learn to manage patients without complications as well as the most frequent emergencies and complications. He/she will attend the teaching activities held at the Cardiovascular Section at the University District Hospital.

MMED 7026 - Clinical Clerkship in Endocrinology and Diabetes. One hundred and sixty (160) hours.
The student will work on patients with endocrine disorders and will learn to manage them under supervision. Will attend the educational activities held at the Endocrinology Section, University District Hospital. He/she will learn to interpret tests related to this subspecialty of Medicine.

MMED 7027 - Diagnosis and Management of Gastrointestinal and Liver Diseases. Eighty to one hundred and sixty (80-160) hours.
The student will work on in-and out- patients with gastrointestinal and liver diseases, learn to establish a diagnosis and management plan emphasizing the use of the history taking and physical examination tools. Attend educational activities of the section and the multidisciplinary activities.

MMED 7028 - Clinical Gastroenterology. Eighty to three hundred and twenty (80-320) hours.
This is an elective course geared to present the student the different aspects in the practice of Clinical Gastroenterology, including the medical history, physical examination, and case discussions. The Pathophysiology Mechanism of the gastrointestinal disorders is emphasized. The student is exposed to the diagnosis procedures and will participate in the academic activities, including research opportunities.

MMED 7029 - Clinical and Laboratory Aspects of Hematology and Oncology. One hundred and sixty (160) hours.
The student will act as an Intern, under supervision. He/she will attend the educational activities, will benefit from audiovisual material, and, if he/she shows interest, will be able to participate in various programs under the supervision of the Hematology Section, University District Hospital.

MMED 7030 - Hematology. One hundred and sixty (160) hours.
The student works on Hematology patients. will participate in the readings of peripheral blood and bone marrow smears; will attend teaching activities held, and if he/she so wishes, will participate on research projects under the supervision of the Hematology Section at San Juan City Hospital.

MMED 7035 - Infectious Diseases and Parasitology. One hundred and sixty to three hundred and twenty (160-320) hours.
The student works on patients with infectious diseases. He/she will perform diagnostic procedures such as, Gram Stains and will use audiovisual materials. He/she will attend teaching activities held and will be supervised by faculty at the University District Hospital.

MMED 7036 - Nephrology. One hundred and sixty (160) hours.
The student will work on patients with renal diseases. He/she will study Renal Physiology, Electrolyte and Acid Base Imbalance and the Principles of Renal Dialysis. He/she will attend teaching activities held at the Renal Section, University District Hospital.

MMED 7037 - Neurology. Eighty to one hundred and sixty (80-160) hours.
The student works on patients with neurological diseases, under supervision. He/she will have the opportunity to study basic concepts about Neurophysiology, Neuropathology and Neuroradiology. He/she will attend the teaching activities held at the University District Hospital.

MMED 7039 - Diagnostic and Management of Pulmonary Diseases. One hundred and sixty (160) hours.
The student will work on patients with respiratory problems including pediatric patients. He/she will be exposed to problems in Pulmonary Allergy. It is expected that he/she will attend the educational activities held at the Pulmonary Section, University District Hospital.

MMED 7040 - Clinical Pneumology. Eighty to three hundred and twenty (80-320) hours.
The student will work on patients with pulmonary pathology problems or diseases. He/she will attend the educational activities held at the section, Mayagüez Medical Center.

MMED 7045 - Basic and Clinical Rheumatology. Eighty to one hundred and sixty (80-160) hours.
This elective course is a review of the Collagen diseases with emphasis on the latest diagnostic and treatment advancements. Students will be exposed to special procedures, under supervision. He/she will attend the teaching activities held at the Rheumatology Section, University District Hospital.

MMED 7046 - General Intensive Care. Eighty to one hundred and sixty (80-160) hours.
The student will familiarize him/herself with the diagnosis and treatment of such conditions that merit Intensive Care. He/she will be able to perform procedures under supervision. He/she will attend teaching activities held at the Intensive Care Unit, VA Hospital.

MMED 7047 - Out Patient Department Clinical Experience. Eighty to one hundred and sixty (80-160) hours.
The student will work on and manage patients at Outpatient Department Clinics, under supervision. Will attend the educational activities held at the clinics and the Internal Medicine Department, University District Hospital.

MMED 7048 - Renal Metabolism. Eighty to one hundred and sixty (80-160) hours.
The student will familiarize him/herself with clinical research and work with patients at the Metabolic Unit. He/she will be exposed to metabolic problems, electrolyte disorders, diabetes and renal diseases. It is expected that he/she will make ward rounds held at the Endocrinology and Renal Section, VA Hospital.

MMED 7057 - Emergency Medicine. Eighty to two hundred and forty (80-240) hours.
The student will participate as a member of the Medical-Resident Team with the faculty members. He/she will work on patients, will perform minor surgical procedures, and will interpret laboratory tests under supervision. These activities will be held at the Emergency Room, Puerto Rico Medical Center.

MMED 7060 - Geriatric Medicine Clerkship. Eighty to one hundred and sixty (80-160) hours.
The student will participate in the day-to-day management of selective geriatric patients. There will be daily group discussions and geriatric boards questions review. The student will participate of rounds at the Geriatric Units; and receive advice from an interdisciplinary faculty. He will accompany the physician and other members of the team in home care visits.

MMED 7080 - Research in Gastroenterology. One hundred and sixty to three hundred and twenty (160-320) hours. Pre-requisite: Medicine I.
The student will be assigned to participate in one or more clinical research projects of the Gastroenterology Research Unit. The student will be part of the research team, including the principal investigator (preceptor), research fellow, statistician-epidemiologist co-investigators and auxiliary personnel. Duties will be according

to his level of skills, and may include search of the literature, participation in study design, patient interviews, record review, data recording, computerized statistical analysis, sampling, and presentations. For 2nd, 3rd & 4th year medical students.

MMED 7085 - Tuberculosis: Clinic and Education. Eighty to one hundred and sixty (80-160) hours. Pre-requisites: Medicine I & II.
The student will be part of the Tuberculosis Clinic Team. Together with the supervising physician, he/she will see patients. The management of patients with the disease will be discussed. Issues to be discussed are: how the diagnosis is made, which laboratory tests are utilized, which is the disease chemotherapy, risk factors for patients with TB, how the contact investigations are made. It is expected the student will present a seminar on one of the areas of diagnosis, treatment and Epidemiology of Tuberculosis.

MMED 7086 - Introduction to Organ and Tissue Donation. Eighty to one hundred and sixty (80-160) hours. Pre-requisite: Medicine I.
The student will spend between 2-4 weeks participating in all activities related to organ and tissue donation and procurement by Lifelink of Puerto Rico. These will include an orientation about the process, attendance to all educational or administrative activities in the office or the community, participation with vascular coordinators in the evaluation of referrals, the donation process, and the organ or tissue procurement from donors. The student evaluation will include attendance, attitudes, interest, professionalism, humanism and an activities roster. Ethical and humanistic aspects of organ donation will be emphasized. The student will have reading assignment on the subjects of donation and transplantation.

MMFA 7010 - Clinical Clerkship in Family Medicine. Eighty to two hundred and forty (80-240) hours.
The student will participate in the care of hospitalized patients at the family medicine ward with emphasis in comprehensive care of all the patients. He/she will be exposed to all the patients, notwithstanding age, sex or type of pathology. Specifically, he/she will manage patients having pediatric, obstetric gynecological, psychiatric and medical surgical conditions. The student will admit patients; make a medical history, perform a physical examination and, together with the resident and the attending staff in charge, will discuss and decide on the plan of action.

MMFA 7016 - Family Practice in the Community. Eighty to one hundred and sixty (80-160) hours.
The purpose of this course is to provide the students the opportunity to observe a family physician applying his/her knowledge and skills in a community setting. Student will be urged to participate in the professional tasks held by the physicians according to their abilities and legal limitations. His/her participation will be way of techniques that will help him/her take a view at the physician's practice and role in the community.

MMFA 7019 - Family Practice Preceptorship. Eighty to one hundred and sixty (80-160) hours.
This elective introduces the student to the clinical practice of a family physician and its role in the solution of community health problems. The student will become acquainted with the most common and prevalent problems encountered in the practice of Family Medicine.

MOBG 7010 - Applied Obstetrics and Gynecology. Eighty to two hundred and forty (80-240) hours.
This course main objective will be to teach the student how to recognize at the early stage, understand, diagnose and treat diseases found in the feminine-genital tract. In addition, they will familiarize themselves with the normal and abnormal aspects of pregnancy. Emphasis will be given to the interrelation with other systems and medical specialties. Duration: 6 weeks.

MOBG 7015 - Applied General Gynecology. Eighty to two hundred and forty (80-240) hours.
To familiarize the student with the most important disease of the reproductive female tract. It is designed to diagnose, manage and know the diseases related to General Gynecology. The student will have the same

responsibilities as an Intern. He/she will attend to Gynecological Clinics, Emergency Room, lectures and case presentations.

MOBG 7016 - Applied Gynecologic Oncology. One hundred and sixty (160) hours.
This elective course enables the student to be acquainted with the most common malignant processes in the reproductive female tract. It is designed to diagnose and manage those conditions. The student will participate in the outpatient clinics of General Gynecology, Emergency Room, case presentations, and journal club discussions. He/she will perform as if an Intern under faculty supervision. He/she will attend surgical procedures relative to the sub-specialty.

MOBG 7017 - Applied Obstetrics. Eighty to two hundred and forty (80-240) hours.
This course aims to familiarize the student with the most important conditions that occur in normal and complicated pregnancies. Most of the time will be allocated to attending prenatal and post-natal clinics (MIC), and at the delivery rooms. The student will show the same tasks as PGY I (Intern) under the direct supervision of residents. He/she will be acquainted with fetal monitoring, Sonography and Amniocentesis as diagnostic procedures.

MOBG 7018 - Fetal Maternal Medicine. Eighty to two hundred and forty (80-240) hours.
The purpose of this elective is to expose the medical student to an experience in the service for high-risk pregnancy. Emphasis is made on the evaluation and management of the high-risk pregnant woman. The activities will be held at the prenatal and delivery wards and at the prenatal high risk and post-natal clinics. He/she will share the same tasks as PGY I (Intern).

MOBG 7027 - Researching in Ob-Gyn. One hundred and sixty to two hundred and forty (160-240) hours.
The course will expose the student to active research in Basic or Clinical Science. The first week will be dedicated to the preparation of the protocol, statistical analysis and report writing. The rest of the time will be assigned to the research project being undergone under the supervision of a professor, stimulating his originality.

MOBG 7028 - Women and Health: Social and Clinical Perspectives on Sexual and Reproductive Health in Puerto Rico. Eighty to two hundred and forty (80-240) hours. Pre-requisite: 1st Level of Medicine.
Through conferences group discussions and independent study, the course is designed to disseminate information and subject matter unknown to many about different aspects of Women's Sexual Reproductive Health in Puerto Rico from Clinical and Social Perspectives. The course also seeks to acquaint students with specific health services realities in the mentioned areas and to encourage research on specific matters, giving students an opportunity to open up to new areas of involvement in the clinical and research fields.

MOFT 7001 - Ophthalmology for the isolated and undeserved: a reflexive practicum. Eighty (80) hours / Two 2 weeks. Pre-requisite: First Year of Medicine.
Because the practice of ophthalmology has evolved into a highly technically sophisticated and equipment dependent endeavor, clinical skills which are not dependent on very expensive equipment have to be acquired and perfected. Practicing ophthalmology in isolated and underserved areas allows the participant to master those skills [Ophthalmoscopy/Slit Lamp Examination], inter-professional alliances, and use of new, but less financially straining technology such as telemedicine (e.g. via software available on ones I-Phone or other handheld device) to engage public health problems such as diabetic retinopathy, glaucoma, retinopathy of prematurity and the ZIKA epidemic among others.

MOFT 7010 - Clinical Ophthalmology. One hundred and sixty to three hundred and twenty (160-320) hours.
This course consists of clinical demonstrations on various methods used to examine the eye and the presentation, at outpatient clinics and hospital, of patients suffering from eye disease. The student will be

able to observe procedures and surgical techniques used at or and examine patients at outpatient department clinics under faculty supervision.

MOFT 7015 - Research in Ophthalmology. One hundred and sixty (160) hours. Pre-requisite: First Year of Medicine.
This course in Ophthalmology research involves the participation of the student in one of the current research projects carried out at the Department of Ophthalmology, such as Epidemiology of Senile Cataracts, Lens Antibodies in Diabetes and Cataracts, Biochemistry of Lens Pigments, or Human Aqueous Humor Composition. The student will receive basic instruction on scientific research methodology, will become familiar with the specific aspects of a particular project (objectives, rationale and significance, methodology, preliminary results) and will have hands-on experience in some defined aspects of its development.

MOFT 7995 - Introduction to Medical Ethics: Constraints and Consequences. Eighty to one hundred and sixty (80-160) hours.
This course will initiate the participant to the Ethical Theory of Principlism as formulated by Beauchamp and Childress. Principlism has been, for the last twenty years, the most often used ethical construct to explain, examine, justify, and evaluate the physician-patient interaction through Four Principles: 1) Autonomy: the self determination of a competent patient; 2) Beneficence: the welfare of the patient as the primary concern; 3) Non-Maleficence: first do no harm; 4) Justice: the balance between benefits and burdens. These principles derived from the common morality, that is tradition and common sense, can lead the competent morally serious person to the right decision. Guest speakers will complement conferences, case presentations and discussions. Self-teaching, modules in form of take-home, multiple choice, and true or false tests will incline the students to read and review the subject matter without increasing the burden of an already challenging curriculum. Grading System: Passed (P), Not Passed (NP)

MPAT 7010 - Basic Anatomic Pathology. One hundred and sixty (160) hours.
Students will be expose to a process of Clinicopathological Correlations. During this period, the student will be exposed to Macroscopic and Microscopic Pathology. The student will help in the performance of some autopsies and the preparation of protocols.

MPAT 7017 - Transfusion Medicine/Blood Banking. Eighty to one hundred and sixty (80-160) hours. Pre-requisite: Second Year of Medicine.
Introduction to all aspects of Transfusion Medicine. Laboratory work will be provided in the Transfusion Service (ASEM), the Blood Bank of American Red Cross and the HLA Laboratory. Contact with patients will be done at the hospitals. Case presentation, rounds, and regular conferences will be held. Emphasis in the knowledge of Immunohematology, blood collection, processing of blood and blood components, storage and shipment, Apheresis, transfusion of blood and components, adverse effects of donor and recipient and the Quality Assurance Program.

MPAT 7019 - Laboratory Medicine. One hundred and sixty (160) hours. Pre-requisites: Courses of Second Year of Medicine.
This elective will introduce the students to the main aspects of Laboratory Medicine as a supplement of their Pathology course and as an aid during their clinical years, in order to learn about the optimum laboratory utilization. The exposure to laboratory work will be provided in the Clinical Laboratory of ASEM through their main sections: Clinical Chemistry, Hematology, Microbiology and Transfusion Medicine. The students will participate in the regularly scheduled conferences and case presentation.

MPAT 7025 - The Ascent of Man. Eighty to two hundred and twenty (80-220) hours.
The Ascent of Man covers, not in strict chronological order but according to the strongly evolutionary model suggested in the title, the Emergence of Humanity, the Agricultural Revolution, Architecture and Engineering,

Metallurgy and Chemistry, Mathematics, Astronomy, Newtonian and Relativistic Mechanics, the Industrial Revolution, Darwinism, Atomic Physics, Quantum Physics, DNA, Neurobiology and Cognitive Science, and Artificial Intelligence. The course follows "The Ascent of Man", Jacob Bronowski's series of video -essays that trace the development of science in the context of the evolution of human civilization- how science has influenced human culture and vice-versa. Using the series as a base, we hope to follow man's journey through western intellectual history: back to the days of Ancient Greece, when Pythagoras was exploring the harmony of nature through numbers; via the Middle Ages and the Renaissance, when Galileo challenged religious dogma with his revolutionary theory of the heavens and Michelangelo was painting the Creation of Adam on the ceiling of the Sistine Chapel; into the Age of Enlightenment, when Newton was writing of the problems of gravity and light in "Principia" and Mozart was composing "The Marriage of Figaro"; and finally to the Quantum Age, with Einstein reflecting on the nature of time and space and Heisenberg pondering on the uncertainty of the quantum world. Science consists of man-made ideas and it should be no surprise, therefore, that great scientific discoveries reflect the age in which they are made: how we think at a particular time. Science is an integral part of man's cultural history and it is important for us to try and understand how science and society have interrelated throughout history up to the present time. It is the aim of the course to explore this theme through dialogue, discussion and debate, thus providing students with the experience of expressing their own ideas and opinions in written and spoken form.

MPAT 7105 - Darwinian Medicine. Fifty-four to sixty (54-60) hours.
Darwinian medicine is the application of modern evolutionary theory to human health and illness, lying at the crossroads between theoretical and applied with human biology, medical anthropology, psychology and physiology. It begins examining the overall concept of evolutionary medicine, advancing through a series of topics showing the scope of impact that evolutionary theory has on medicine today. A continuing theme will be the disparity between proximate and the ultimate causes, approached through an evolutionary interpretation. It will lay emphasis upon those situations and conditions of health (or illness) that necessitate both proximate and ultimate causality. It will address Homo sapiens as a microecosystem grounded on the complex interaction of genotype, phenotype, environment, and behavior that influence health and illness. It will also address recent re-evaluation of the biological locus of Homo sapiens, its evolvability and the status of human evolution. Grading System: Passed (P), Not Passed (NP)

MPAT 7995 - Instructional and Evaluation Strategies in Pathology. Eighty to one hundred and sixty (80-160) hours. Pre-requisites: First and Second Level of Medicine.
This course is designed for Third and Fourth Level medical students. It will allow the student to explore and develop teaching skills, including the preparation of educational materials, such as lectures using Power Point, offering laboratory exercises, leading small group discussions and/or tutorials during the Pathology course offered to Second Level Year medical student. The course coordinator will supervise the development of the skills. The medical student will also learn how to write best answer questions and will study the characteristics that distinguish professor of excellence. The methodology to attain these objectives includes lectures, independent study, group discussions, and supervised practice.

MPAT 7996 - Pediatric Pathology. Eighty to one hundred and sixty (80-160) hours. Pre-requisite: Completed 2nd Year of Medicine.
The course will expose the students to the process of Clinicopathologic Correlations in the field of Pediatric Pathology. During a period of four weeks, the student will be exposed to gross and microscopic examination of pediatric specimens and placentas. The student will also participate in the weekly Pediatric Treatment Planning Conference (TPC). The student will perform a pediatric autopsy and will be responsible for the Autopsy Protocol and Clinicopathologic Correlation. This case will be presented at the end of the rotation at the Autopsy Review Conference.

MPAT 7997 - Medicine in Shakespeare. Thirty-six to forty-eight (36-48) hours.
This course will explore the tragedies of King Lear, Othello, Macbeth and Hamlet from a medical viewpoint. The plays will present men and women finding their identities or forge new ones while they struggle to balance obligations to family, society, and self. The student will see and analyze their struggle with the outcome of choices made. Through this course, the student shall explore Shakespeare's dramatic art for conveying human foibles, fallibility and weaknesses as well as his deep understanding of our humanity. Students will develop a clinical history of the play's main character.

MPED 7001 - Pediatric Environmental Health. Eight to one hundred and sixty (80-160) hours. Pre-requisite: Have completed Third Year Pediatrics Clerkship.
During this course, students will learn to take an environmental history and field clinical questions at our center regarding childhood/prenatal environmental exposures (such as lead, pesticides, mold, air pollution), under the guidance of a clinical personnel led by a pediatrician trained in Environmental Pediatrics. Students will also have the opportunity to participate in clinical evaluations, educational seminars and lectures, meetings with representatives from public health agencies, and to assist the team with ongoing community-based projects. The students will have the opportunity of applying clinical skills focused in the area of developmental and behavioral pediatrics and neurodevelopment.

MPED 7010 - General Pediatrics. Eighty to two hundred and forty (80-240) hours.
The student will demonstrate the acquisition of knowledge and skills necessary to work on the diagnosis and management of the most common pediatric conditions. He/she will attend activities held at wards for hospitalized patients and/or pediatric emergency room.

MPED 7015 - Introduction to Care of High-Risk Infants. Eighty to one hundred and sixty (80-160) hours.
The student will acquire knowledge and skills in the detection and management of the high-risk infant. The educational activities will consist of lectures, seminars and case demonstrations about the care of the high-risk infant. Special emphasis will be made in the care of the acutely ill patient. An opportunity will be available for the student to learn about the interpretation of clinical problems on acid base balance.

MPED 7018 - Introduction to Pediatric Cardiology. Eighty to one hundred and sixty (80-160) hours.
This course consists of the evaluation of hospitalized and ambulatory patients served at the Pediatric Cardiology Section. Emphasis will be made on electrocardiography readings, cardiac catheterization and the correlation of these with the clinical diagnosis and physiologic data.

MPED 7019 - Primary Pediatric Health Care. Eighty to four hundred and eighty (80-480) hours.
This course is divided into two mayor areas. The Care of the Acute Patient and Developmental Pediatrics and Health Maintenance. During the First Phase, the student will attend activities related to the evaluation of children at the Emergency Room, while studying the Phase; he/she will be exposed to developmental behavioral and learning disorders as well as patients with cerebral palsy and defects in the central nervous system. During the Third Phase of the course, the student will attend activities held at the School-Health Clinic and Maternal Infant Care Clinic, both involved in the follow-up care of healthy children.

MPED 7020 - Pediatric Endocrinology. One hundred and sixty to three hundred and twenty (160-320) hours.
The student will participate in activities pertinent to the diagnosis, evaluation and management of children having endocrinological, metabolic, and genetic problems. Emphasis will be made on clinical experiences with hospitalized elective patients and at the Emergency Room. He/she will have the opportunity to interpret bone/age, X-Rays, and endocrine laboratories.

MPED 7026 - Clinical Genetics. One hundred and sixty (160) hours.
The student will show acquisition of knowledge and skills in the detection, diagnosis, and management of neonates with congenital anomalies. The course includes a review of basic concepts about Mendelian Patterns, especially those pertinent to pathology of chromosomes and transmission of diseases involving one or more genes, the detection and evaluation of hereditary and chromosome pathology related diseases. Genetic counseling and prevention is also included.

MPED 7027 - Pediatric Nephrology. One hundred and sixty to four hundred and eighty (160-480) hours.
The student will have the opportunity to evaluate and manage ambulatory and hospitalized patients suffering from renal diseases, in renal failure and in Hemodialysis. They will be acquainted with those laboratory procedures necessary to evaluate patients. The course also offers the opportunity for a limited research project in Pediatric Nephrology.

MPED 7028 - Clinical Pediatric Neurology. Eighty to one hundred and sixty (80-160) hours.
The student will be acquainted with the most common clinical entities in Pediatric Neurology. Emphasis will be made in the basic skills needed to perform a neurologic evaluation and in the pathophysiologic mechanisms present in the clinical course of the disease.

MPED 7030 - Pediatric Hematology and Oncology. Eighty to one hundred and sixty (80-160) hours.
The student will become a member of the team in the Hematology and Oncology Section. He/she will actively participate in all of the activities held at the section. He/she will make an in-depth study of a clinical case, performing a review of literature pertinent to the case, under direct supervision of one of the members of the medical team.

MPED 7036 - Pediatric Intensive Care. Eighty to one hundred and sixty (80-160) hours.
The student will have the opportunity to work on critically ill patients and will learn about the normal and pathological physiology of some diseases. He/she will learn about management of patients in respiratory and cardiovascular failure, in coma, and the use of fluids/electrolytes, artificial lungs and mechanisms.

MPED 7045 - Pediatric Oncology. Eighty to one hundred and sixty (80-160) hours.
The student will become a member of the team in the Oncology Program. He/she actively participate in all of the activities held at Oncology Ward and Clinics. He/she will make an in-depth study of a clinical case, performing a review of literature pertinent to the case, under direct supervision of one of the members of the medical team.

MPED 7046 - Developmental Pediatrics and Developmental Disabilities. Eighty to one hundred and sixty (80-160) hours.
Comprehensive assessment of the child with developmental disorders, with emphasis in early identification, therapy and management of children with mental retardation, motor delay, cerebral palsy, language, learning and behavior disorders.

MPED 7105 - Research in Pediatrics. One hundred and sixty to three hundred and twenty (160-320) Hours. Pre-requisite: Medicine I.
This is a laboratory course with field experiences directed to medical students. It is expected for the students to learn the basic elements of the research process in Pediatrics through the close interaction with a research preceptor/mentor, and their participation in some of the departmental research projects.

MPED 7106 - Research on the History of Health. One hundred and sixty to three hundred and twenty (160-320) Hours. Pre-requisite: Medicine I.
This course aims to provide students with an investigation in history events, and professional conceptions related to health problems using resources from the Medical Sciences Campus and the Rio Piedras Campus of the University of Puerto Rico. Students will make and original investigation using primary and secondary resources. Student will select an investigation project adjusting to data available to analyze his knowledge in history and duration of the course.

MPRI 7117 - Medical Histology. Eighty-two to one hundred (82-100) hours.
Conferences, laboratories and discussions about the normal microscopic structure of the cell, tissues and organs in relation to principles of biochemistry, physiologic and molecular biology pertinent to the medical practice.

MPRI 7119 - Fundamentals of Molecular Medicine. Ninety-nine to one hundred and twenty-one (99-121) hours.
The first half of the course includes basic physical-chemistry principles, structure and properties of proteins and enzymes, energetic metabolism and metabolic pathways of carbohydrates, lipids and amino acids. General hormone action. The second half emphasizes the fundamental aspects of molecular biology and its projections into modern medicine. Includes the structure and properties of genetic material, nature of the genetic information and genetic code. Duplication and repair of DNA. Repetitive and specific sequences. Introns, exons, palindromes, promoters, transposons, enhancers, etc. oncogenes, mutations, genetic recombination and genetic engineering, gene therapy. Transcription and translation. Control of genetic expression. Utilization of molecular biology methodology in medicine. The course ends with a series of topics on physiological biochemistry such as blood proteins, coagulation and fibrinolysis, muscle contraction, vitamins and basic concepts on nutrition. Most of the subjects of the course are illustrated with clinical correlations.

MPRI 7120 - Human Physiology. One hundred and forty-four to one hundred and seventy-six (144-176) hours.
This course presents cellular and system physiology and its control. The physio-chemical basis of biological phenomena are emphasized. The course includes theoretical and experimental sessions with group discussions. Clinical protections of physiological phenomena are introduced whenever this is possible.

MPRI 7127 - Public Health, Preventive Medicine and Population Health. Eighteen to twenty-two (18-22) hours.
This is the first course of a four-year curriculum in Public Health for medical students. The course is designed to introduce medical students to fundamental concepts of Public Health, Preventive Medicine and Population Health, including basic quantitative indicators of morbidity and mortality in populations; surveillance systems; major data sources for assessing the health status of populations; screening for undiagnosed diseases in populations, assessment of screening and diagnostic tests; guidelines for community and clinical preventive services, and health objectives as presented in Healthy People 2010.

MPRI 7130 - Integration Seminar I. Fifty-four to sixty-six (54-66) hours.
The course will develop skills in computerized information retrieval and appropriate use of library resources. A variety of related clinical skills will be developed. The study of clinical cases with emphasis in the basic sciences associated concepts will be introduced. Grading system: Passed (P), Not Passed (NP)

MPRI 7136 - Neurosciences. Ninety-nine to one hundred and twenty-one (99-121) hours.
Neurosciences includes function of the individual nerve cell, basic anatomical connections and organization of the central nervous system, and integrative and systems neurophysiology. These topics are reinforced by laboratories in neuroanatomy and neurophysiology as well as clinical correlation conferences.

MPRI 7137 - Human Behavior. Forty-five to fifty-five (45-55) hours.
Upon completion of this course, the participants will identify the basic knowledge of the behavioral sciences; will also develop skills and attitudes that will enable him/her to understand the psychopathology of psychiatric disorders and clinical psychiatry.

MPRI 7138 - Introduction to Clinical Skills. Sixty-eight to eighty-two (68-82) hours. Co-requisites: First Level Medicine courses.
This course is offered to the whole class of first level medical students with the purpose of developing important skills which are necessary for the practice of medicine, such as: the medical interview, including adult, pediatric and geriatric patients; physical examination, including the correct techniques and normal findings; the correct use of diagnostic medical equipment; universal precautions, occupational safety and personal protective measures; venipuncture and parenteral medications administration; cardiopulmonary resuscitation. At the same time, this course will serve as an introduction and liaison with clinical setting in which these students receive most of their training. Grading system: The grading system for this course was Passed (P) Not Passed (NP), since August 2005 it changes to the traditional grading system of A, B, C, F.

MPRI 7139 - Human Development Course. Sixty-eight to eighty-two (68-82) hours.
This course presents the basic principles of human development, from conception to old age, using the biopsychosocial model. This model includes aspects of medical genetics. The environment and their interaction with the integral development of the person. The course is addressed to first year medical students. The educational methodology to be use includes, among others: small group discussions, lectures, panel discussions by medical students and or faculty, independent studies utilization of external resources and patients.

MPRI 7140 - Medical Gross Anatomy and Embryology. One hundred and fifty-eight to one hundred and ninety-two (158-192) hours.
Through lectures, laboratory dissections, and discussions future physicians will be familiarized with the normal three-dimensional structure and functional organization of the human body. Students will analyze early embryonic development and the patterns for formation of all major organs in the human embryo, which provide the conceptual basis for comprehending both normal human anatomy and congenital malformations.

MPRI 7145 - Medical Ethics: Constraints and Consequences I. Sixteen to eighteen (16-18) hours.
This course provides the student an approach to normative ethics. It will initiate the participant in the ethical system of Principlism as formulated by Beauchamp and Childress. Principlism has been, for the last twenty years, the most often used ethical construct to explain, examine, justify and evaluate the physician-patient interaction through three principles, which are derived from common morality: 1) autonomy; 2) beneficence, and 3) justice. Beginning the end of life dilemmas will be exhaustively analyzed. Other ethical perspectives such as basic human goods, existential phenomenology, contractualism, deontology, utilitarianism, eclectic syncretism, and relativism will be discussed.

MPRI 7155 - Introduction to Principles of Clinical and Translational Research. Forty to forty-four (40-44) hours.
The objective of this course is to introduce medical students to the principles of clinical and translational research early in their careers. Through lectures, group discussion, and practice exercises students are

expected to acquire basic research skills and to integrate new scientific views and knowledge of biomedical sciences with clinical research. The course includes topics that emphasize basic knowledge on clinical and translational research, such as ethics, research methodologies, critical analysis, and patient interventions, among others. Grading system: Passed (P), Fail (F)

MPSI 7010 - Clerkship in Psychiatry. Eighty to two hundred and forty (80-240) hours.
The student will participate in the complete workup of a patient and family. He/she will be assigned to current activities and seminars offered to psychiatric residents while in this rotation.

MPSI 7015 - Comprehensive Child Psychiatry. One hundred and sixty to two hundred and forty (160-240) hours.
The student will participate in the evaluation and management of children and adolescents. He/she will participate in all the daily activities held by his/her Proctor. Readings will be assigned.

MPSI 7018 - Alcohol Dependence. Eighty to one hundred and sixty (80-160) hours.
This course is designed to familiarize the student with the etiology, diagnosis and treatment of drug dependency.

MPSI 7019 - Introduction to Drug Dependence. Eighty to two hundred and forty (80-240) hours.
The student will be exposed to the technique of evaluating and managing patients with dependency and addiction to substances.

MPSI 7025 - Psychiatric Research. One hundred and sixty (160) hours.
Students in this course will be familiarized with the basic skills in Psychiatric Research. Emphasis will be placed on the development of a short-term research project preferable clinically oriented.

MPSI 7026 - Psychiatric Emergencies. Eighty to one hundred and sixty (80-160) hours.
This course offered the student the opportunity to evaluate patients suffering a Psychiatric Emergency, as well as to initiate prompt and intermediate therapies.

MRAD 7015 - Diagnostic Radiology. Eighty to one hundred and sixty (80-160) hours.
This is an elective course with emphasis on readings and individualized tutorships. The student will participate in all radiologic procedures held at the service. He/she will analyze X-Rays, will discuss the diagnosis, techniques and indicators with his/her Proctor. He/she will attend to inter-departmental conferences in which the Radiology services are involved. X-Ray records will be used. He/she will also participate at the combined lectures with the Radiology residents.

MRAD 7017 - Introduction to Clinical Practice of Nuclear Medicine. Eighty to one hundred and sixty (80-160) hours.
This course serves as an introduction to the clinical practice on Nuclear Medicine. It aims to familiarize with the principles and basic techniques to this field of Medicine and relate them to the practice of General Medicine. The student will be assigned to the Outpatient Clinic and to the laboratory where he/she will actively participate in all the activities held.

MSEG 7215 - Pathology and Introduction to Laboratory Medicine. One hundred and forty-six to one hundred and seventy-eight (146-178) hours.
The study of the natural history of diseases, including their origins and causes, evolution and final outcome, as well as the effect upon the said natural history of clinical interventions; this also includes all techniques, methods and procedures applied to the examination of cells, tissues and fluids of the human body employed in the analysis of the said history.

MSEG 7216 - Infectious Diseases. One hundred and twenty-six to one hundred and fifty-four (126-154) hours.
Introduction to basic concepts in bacterial physiology and genetics. The study of the epidemiology, taxonomy, diagnosis, immunopathology, and treatment of the microorganisms of medical importance (bacteria, virus, fungi, and parasites).

MSEG 7217 - Introduction to Medical Pharmacology. Ninety-nine to one hundred and twenty-one (99-121) hours.
Basic medical pharmacology and introduction to therapeutics. Emphasis on vocabulary, mechanisms of action and handling of drugs in the body. Prototype drugs of the mayor classes will be studied in detail.

MSEG 7218 - Basic Clinical Diagnosis. Ninety to one hundred and ten (90-110) hours.
This course includes two essential processes for the clinical study of the diseases: medical history of the disease that affects the patient and a complete physical examination. To obtain the necessary skills and achieve these two essential processes the student will be exposed to a series of clinical experiences. These will involve the obtainment of pertinent medical history, besides a complete physical examination of the affected area. Systems to be discussed will be: cardiovascular, respiratory, musculoskeletal, gastrointestinal, reticuloendothelial, neurological and genital urinary.

MSEG 7229 - Psychopathology. Thirty-six to forty-four (36-44) hours. Pre-requisites: Courses of First Year of Medicine (MPRI).
This course is designed to provide second year medical students with basic knowledge related to the major psychiatric entities of the DSM-III-R. The methods used for delivering content will be lectures, audiovisual presentations and small group discussions. The evaluation will be by short quizzes and summative exam.

MSEG 7230 - Mechanisms of Disease. One hundred and thirteen to one hundred and thirty-seven (113-137) hours. Pre-requisites: Courses of First Year of Medicine (MPRI). Co-requisites: Courses of Second Year of Medicine (MSEG).
Through correlation of basic sciences with the clinical disciplines, this course will introduce and stimulate the student to understand the physiopathology bases using a dynamic and innovative approach. Given the broad spectrum of medical knowledge, this course will develop critical thinking and analysis of signs and symptoms of different diseases integrating basic knowledge to the mechanisms of diseases.

MSEG 7236 - Integration Seminar II. Forty-nine to fifty-nine (49-59) hours. Pre-requisites: MPRI 7130.
The goal of the course is to extend and refine the skills initiated during the Integration Seminar I counterpart. To develop further the habits of self-directed, student-centered, problem base learning within a clinically relevant format, designed to reinforce the contents of the second-year curriculum and generate new knowledge, considering the biopsychosocial aspects of comprehensive health care.

MSEG 7237 - Fundamentals of Clinical Epidemiology and Evidence-Based Medicine. Thirty-six to forty four (36-44) hours. Pre-requisite: MPRI 7127.
This course presents an introduction to quantitative clinical research to medical students in their second year of education through biostatistics and clinical epidemiology methods. Topics include: descriptive and inferential statistics; absolute and relative measures of risk; person-time units and survival analysis; clinical trials; observational analytical studies; bias; confounding; adjustment, and causality.

MSEG 7245 - Medical Ethics II: Critique and Methods. Sixteen (16) hours.
This course will review the fundamental theory of Principalism and the application of autonomy, beneficence, non-malfeasance and justice to the doctor-patient relationship through an evaluation of different clinical cases and public policy. Particular cases and public policy statements will be evaluated in the following

dimensions: 1) objective clinical status regarding diagnosis, prognosis, possible interventions including doing nothing, most likely outcomes, conflicts of interest and cultural differences; 2) informed consent; 3) third party interests.

MTER 7310 - Psychiatry. Eighty to two hundred and forty (80-240) hours.
This course is one phase of the course in clinical psychiatry for third year medical students. It consists of a series of lectures, assigned readings, and clinical experience evaluating psychiatric patients. At the end of third year, it is expected that the student will be able to differentiate normal states from psychiatric disorders. He/she will acquire knowledge, skills and develop attitudes, enabling him/her to arrive a diagnosis therapeutic plan and prevention of disorders. He/she will also be able to promote mental health. He/she will apply these objectives during the intensive five-week course as well as at liaison activities with other departmental courses and throughout his/her professional life.

MTER 7316 - Pediatrics Clerkship. Three hundred and twenty to four hundred and eighty (320-480) hours.
The Pediatric Clerkship addresses issues unique to persons from prenatal age to late adolescence. The objectives define the "core" of pediatric knowledge, skills and attitudes, which every general physician must master. The clerkship includes liaison psychiatry, adolescent medicine and pediatric HIV program clinical rotations. The comprehensive patient care experiences are varied and relevant to the most common P.R. children health problems. Approximately 60% of a student's time will be spent in outpatient (ambulatory) settings.

MTER 7318 - Obstetrics and Gynecology. One hundred and sixty to three hundred and twenty (160-320) hours.
This third-year clerkship is designed to last six full weeks. Time is allotted equally to work/study on services of gynecology and obstetrics. Students are exposed to patients at pre-labor rooms; prenatal clinics, emergency room, and operating room. Each student must perform a minimum of twelve deliveries and present fifteen cases.

MTER 7320 - Introduction to Diagnostic Radiology and Nuclear Medicine. Forty to one hundred and twenty (40-120) hours. Pre-requisites: Courses of Second Year of Medicine (MSEG).
The course is designed for third year medical students. The topics will be presented by means of conferences and small-group discussions of clinical cases. Topics to be discussed include basic concepts in image formation of various modalities available in the fields of Diagnostic Radiology and Nuclear Medicine; basic concepts in the interpretation of these imaging modalities; indications and applications for diagnostic imaging modalities.

MTER 7325 - Clinical Internal Medicine. Four hundred to five hundred and sixty (400-560) hours. Pre-requisites: First and Second Year of Medicine.
The Internal Medicine Clerkship encompasses all the aspects of adult medicine, disease processes, prevention and health maintenance. It provides clinical experience in the in-patient and outpatient settings. Throughout these experiences, the students will have the opportunity to apply the concepts learned in the first two years of Medical School. The clerkship includes general internal medicine and internal medicine subspecialties, such as: allergy/immunology, cardiology, endocrinology, gastroenterology, geriatrics, hematology/medical oncology, infectious diseases, nephrology, pneumology, and rheumatology. As part of the core curriculum, medical students will develop competencies in advanced history taking and physical examination. Diagnostic work ups and therapeutics will be covered through experiences with real patients. The clinical experience will be divided equally between hospitalized and ambulatory patients.

MTER 7326 - Surgical Clinical Internship. Three hundred and twenty to four hundred and eighty (320-480) hours. Pre-requisites: MTER 7316, MTER 7319, MTER 7325.
This course will consist of a rotation of 10 weeks through all the surgical specialties and general surgery. The principle objective is to train medical students in the recognition, diagnosis and immediate treatment of common and critical conditions in the area of general surgery and specialties. Understand by critical those conditions that if not known of, could cause permanent multiple damage or death to the patient. Multiple models of teaching should be utilized that will include: conferences (2 hours daily the first 6 weeks), ambulatory clinical experience (60%), emergency clinical experience (80%), problem solving sessions (14 sessions of 2-3 hours), laboratory and practice workshops in basic techniques: sutures, resuscitation, recognizing arrhythmias, curve interpretation and hemodynamics parameters computer assisted learning.

MTER 7438 - Dermatology. Forty to eighty (40-80) hours. Pre-requisites: Second Year of Medicine.
This course will consist of lectures offered by the faculty of the department of Dermatology. The students will attend OPD Dermatology Clinic and will manage patients under supervision of staff and residents. He/she will take a written and/or oral examination at the end of the course that will cover the topics discussed at lectures. Student's attendance to all activities is compulsory.

Division of Biomedical Sciences and Graduate Program

The Division of Biomedical Sciences and Graduate Program offers five programs leading to a Doctor of Philosophy degree. These have specialties in anatomy, biochemistry, microbiology, pharmacology, and physiology.

There are five Master of Science programs (with specialties in anatomy, biochemistry, microbiology, pharmacology, and physiology) currently in a moratorium status, after administrative and academic evaluations (Certification #40 2025-2026 UPR Governing Board). Institutional procedures are underway to complete the master's programs moratorium and closure, following established academic governance protocols. These are not expected to be reactivated in the near future. A new interdisciplinary master's degree is under development. Additional information of the new program will be provided in the future.

The Ph.D. programs are at least four-year programs. At the end of the second or third semester or after completion of required courses, doctoral students must pass a qualifying examination. Before the end of the third year, the doctoral student must present and successfully defend his/ her dissertation proposal before a committee of the graduate faculty. Students participate in a wide variety of seminars, workshops, and similar activities scheduled by the departments. They may also participate in clinical activities that may be germane to their research topic. The graduate faculty fosters interdisciplinary collaboration between basic and clinical scientists in an effort to broaden the students' exposure beyond what is traditionally expected in biomedical research.

The Division cosponsors an intercampus Ph.D. program with specialty in Biology with the Department of Biology of the Río Piedras Campus. The intercampus program allows students to benefit from the scientists, facilities, equipment, and course offerings at the two largest research institutions in the Caribbean. There is also an option for a combined M.D./Ph.D. degree at the institution or in the joint program with Mayo Clinic or MD Anderson.

RESEARCH FACILITIES

The Division's facilities are housed in the Medical Sciences Campus building, with ancillary facilities at the:

- Institute of Neurobiology
- Caribbean Primate Research Center
- UPR Comprehensive Cancer Center
- Cancer Center
- Latin American Center for the Study of Sexually Transmitted Diseases
- Veterans Administration Hospital
- University Hospital
- University Pediatric Hospital
- Other affiliated hospitals
- Centers for Disease Control – San Juan
- Molecular Sciences Research Center
- Inflammatory Bowel Disease Center

Facilities house core, research and teaching laboratories, faculty offices, lecture rooms, and specialized libraries. A central library serves the general needs of the academic community, with linkages to other local and national libraries. Each department has its own laboratories and office space for faculty and students, as well as specialized equipment.

A system of core laboratories serves the needs of several departments, providing facilities for tissue culture, electron microscopy, facilities for molecular biology, genomics, proteomics, metabolomics and emerging infectious diseases as well as a BL3 virology laboratory, and state-of-the-art animal facilities, including BL3 areas for nonhuman primates.

Students are granted access to the resources they may need to carry out their research project if they comply with regulatory requirements for each type of facility.

Admission Requirements (Minimum Requirements for Admission)

- Bachelor's degree or its equivalent from an accredited institution
- Minimum general grade point average (GPA) of 3.0 in a scale of 4.0
- Minimum grade point average in science courses (GPS) of 3.0 in a scale of 4.0
- Complete Graduate Record Examination (GRE) general test.
- Three (3) letters of recommendation, using the official forms provided in our website; at least two (2) of these must be from professors in the field of study.
- An interview with faculty members of the Department to which the student is applying.
- A working knowledge of English and Spanish
- If the student lists previous research experience, they should provide evidence, such as abstracts, manuscripts, and others.
- Submission of the application form and other required documents on time.
- Submission of an essay in English (250 maximum word count) describing the student interest in the field, is highly recommended.

Traditionally, students with the minimum GPA and GPS and receive final scores of 60 or higher in the admission formula are recommended for admission to the PhD program. Students with final scores between 50 and 59 in the admission formula are recommended for admission to the MS program.

Application deadline is: February 1 for admission in August of the next year. Requests for more information and application forms should be addressed to:

Division of Graduate Studies,
Suite A 847 School of Medicine,
Medical Sciences Campus, UPR
P.O. Box 365067
San Juan, Puerto Rico 00936 5067

GRADUATION Requirements

- Complete all courses required by the program according to the approved curriculum with a minimum GPA of 3.0.
- Pass the Qualifying Examination for PhD students.
- Write, present and obtain approval of a thesis/dissertation research proposal.
- Conduct and complete the approved research project.
- Write, present, defend, and obtain approval of the thesis/dissertation.

DEPARTMENT OF ANATOMY AND NEUROBIOLOGY

MASTER OF SCIENCE WITH SPECIALTY IN ANATOMY (M.S.) CURRICULUM

Total Semester Credit Hours: 36

This program is **currently in a moratorium status**, after administrative and academic evaluations (Certification #40 2025-2026 UPR Governing Board). Institutional procedures are underway to complete the master's program closure, following established academic governance protocols. It is not expected to be reactivated in the near future. A new interdisciplinary master's degree is under development. Additional information of the new program will be provided in the future.

DOCTOR OF PHILOSOPHY WITH SPECIALTY IN ANATOMY (Ph.D.) CURRICULUM

Total Semester Credit Hours: 64

Total of 12 credits in electives course is required.

Recommended courses: ANAT 8528, 8591, 8593, 8596, 8996 CBIO 8991, 8992		12

First Year

ANAT 8411	Human Gross Anatomy I	4
ANAT 8412	Human Gross Anatomy II	4
ANAT 8513	Human Embryology I	1
ANAT 8514	Human Embryology II	1
ANAT 8611	Human Neuroanatomy and Neuroscience I	2
ANAT 8612	Human Neuroanatomy and Neuroscience II	3
ANAT 8613	Human Cell Biology and Histology I	2
ANAT 8614	Human Cell Biology and Histology II	2
ANAT 8532	Seminar and Journal Club (I)	1
ANAT 8532	Seminar and Journal Club (II)	1
Electives		

Second Year

CBIO 8500	Statistics for the Biomedical Sciences	3
ANAT 8526	Practice in Teaching	3
ANAT 8532	Seminar and Journal Club (III)	1
BCHM 8511*	Biochemistry I: Structure, Function, Processes, and Reactions.	3
FISA 8105*	Basic Concepts of Human Physiology	3
ANAT 8532	Seminar and Journal Club (IV)	1
ANAT 8525 or		
ANAT 8526	Practice in Teaching	2 or 3
Electives		

**(or equivalent course approved by the Department)*

Third Year

Qualifying Exam & Dissertation Proposal
Electives

Fourth and Fifth Year

ANAT 8599	Doctoral Dissertation Research	15

DEPARTMENT OF BIOCHEMISTRY

MASTER OF SCIENCE WITH SPECIALTY IN BIOCHEMISTRY (M.S.) CURRICULUM*
Total Semester Credit Hours: 33

This program is **currently in a moratorium status**, after administrative and academic evaluations (Certification #40 2025-2026 UPR Governing Board). Institutional procedures are underway to complete the master's program closure, following established academic governance protocols. It is not expected to be reactivated in the near future. A new interdisciplinary master's degree is under development. Additional information of the new program will be provided in the future.

DOCTOR OF PHILOSOPHY WITH SPECIALTY IN BIOCHEMISTRY (PH.D.) CURRICULUM
Total Semester Credit Hours: 63

First Year: 24 Credit Hours

BCHM 8511	Biochemistry I: Structure, Function, Processes, and Reactions	3
BCHM 8512	Biochemistry II: Understanding the Human Genome and its Implications	3
BCHM 8551	Methods in Protein and Nucleic Acid Biochemistry	2
BCHM 8552	Methods in Lipid and Carbohydrates Biochemistry, Nutrition, and Biochemical Pharmacology	2
BCHM 8531	Research Seminar Series I	1
BCHM 8532	Research Seminar Series II	1
CBIO 8500	Statistics for the Biomedical Sciences	3
BCHM 8504	Biochemistry of Proteins	3
BCHM 8502	Molecular Biology	3
BCHM 8507	Special Biochemical Laboratory Techniques I or Elective Recommended by the Department	3

Second Year: 21 Credit Hours

BCHM 8533	Research Seminar Series III	1
BCHM 8534	Research Seminar Series IV	1
BCHM 8515	Enzyme Kinetics and Mechanism	2
BCHM 8517	Physical Chemistry of Macromolecules	3
Electives		14

Third: 5 Credit Hours

BCHM 8526	Proposal	3
BCHM 8535	Research Seminar Series V	1
BCHM 8535	Research Seminar VI	1

Fourth and Fifth Year: 15 Credit Hours

BCHM 8599	Research for Doctoral Thesis	15

DEPARTMENT OF MICROBIOLOGY AND INMUNOLOGY

MASTER OF SCIENCE WITH SPECIALTY IN MICROBIOLOGY (M.S.) CURRICULUM
Total Semester Credit Hours: 33

This program is **currently in a moratorium status**, after administrative and academic evaluations (Certification #40 2025-2026 UPR Governing Board). Institutional procedures are underway to complete the master's program closure, following established academic governance protocols. It is not expected to be

reactivated in the near future. A new interdisciplinary master's degree is under development. Additional information of the new program will be provided in the future.

DOCTOR OF PHILOSOPHY WITH SPECIALTY IN MICROBIOLOGY (PH.D.) CURRICULUM
Total Semester Credit Hours: 64

MICR 8499	Introduction to Medical Microbiology	6
BCHM 8511	Biochemistry I: Structure, Function, Processes, and Reactions	3
BCHM 8512	Biochemistry II: Understanding the Human Genome and its Implications	3
MICR 8580	Graduate Seminar	1
MICR 8540	Principles of Immunology	3
MICR 8496	Introduction to Research	1
CBIO 8500	Statistics for the Biomedical Sciences	3
MICR 8580	Graduate Seminar	1
MICR 8590	Teaching Practice	1
MICR 8597	Preparation for Comprehensive Exam of Microbiology	3
MICR 8596	Preparation of Thesis Proposal in Microbiology	1
MICR 8580	Graduate Seminar	1
MICR 8599	Doctoral Dissertation	15
	Advanced Topics in Area of Specialization	11
Electives	Two Department Courses	11

DEPARTMENT OF PHYSIOLOGY

MASTER OF SCIENCE WITH SPECIALTY IN PHYSIOLOGY (M.S.) CURRICULUM
Total Semester Credit Hours: 31
This program is **currently in a moratorium status**, after administrative and academic evaluations (Certification #40 2025-2026 UPR Governing Board). Institutional procedures are underway to complete the master's program closure, following established academic governance protocols. It is not expected to be reactivated in the near future. A new interdisciplinary master's degree is under development. Additional information of the new program will be provided in the future.

DOCTOR OF PHILOSOPHY WITH SPECIALTY IN PHYSIOLOGY (PH.D.) CURRICULUM
Total Semester Credit Hours: 61

First Year: 18 Credit Hours

FISA 8105	Basic Concepts of Human Physiology	3
BCHM 8511	Biochemistry I: Structure, Function, Processes, and Reactions	3
CBIO 8500	Statistics for the Biomedical Sciences	3
BCHM 8512	Biochemistry II: Understanding the Human Genome and its Implications	3
FISA 8503	Seminar in Physiology	1
FISA 8215	Advanced Physiology	5

Second Year: 22 Credit Hours

FISA 8540	Cellular Molecular Physiology	3
FISA 8541	Laboratory Rotations	3
Elective	Department Courses	3
Elective	From any other department	3
FISA 8503	Seminar in Physiology	1
FISA 8532	Instrumentation and Methodologies used in Biomedical Research	3

Elective	Department Courses	3
Elective	From any other department	3

Third Year: 20 Credit Hours

FISA 8585	Preparation of Physiology Proposal	3
FISA 8503	Seminar in Physiology	1
FISA 8599	Doctoral Thesis	15
Elective	From Department	1

Fourth Year: 1 Credit Hour

FISA 8503	Seminar in Physiology	1
FISA 8599	Doctoral Thesis (Continuation)	0

DEPARTMENT OF PHARMACOLOGY

MASTER OF SCIENCE WITH SPECIALTY IN PHARMACOLOGY (M.S.) CURRICULUM
Total Semester Credit Hours: 35

This program is **currently in a moratorium status**, after administrative and academic evaluations (Certification #40 2025-2026 UPR Governing Board). Institutional procedures are underway to complete the master's program closure, following established academic governance protocols. It is not expected to be reactivated in the near future. A new interdisciplinary master's degree is under development. Additional information of the new program will be provided in the future.

DOCTOR OF PHILOSOPHY WITH SPECIALTY IN PHARMACOLOGY (PH.D.) CURRICULUM
Total Semester Credit Hours: 60

First Year: 15 Credit Hours

FISA 8105	Basic Concepts of Human Physiology	3
BCHM 8511	Biochemistry I: Structure, Function, Processes, and Reactions	3
BCHM 8512	Biochemistry II: Understanding the Human Genome and its Implications	3
PHAR 8513	Pharmacology Seminar	1
PHAR 8535	Laboratory Rotation in Pharmacology and Toxicology	2
PHAR 8526	General Principles in Pharmacology	3

Second Year: 13 Credit Hours

PHAR 8500	Pharmacology	5
PHAR 8513	Pharmacology Seminar	1
PHAR 8508	Topics of Pharmacology	4
CBIO 8500	Statistics for the Biomedical Sciences	3

Third and Fourth Years: 32 Credit Hours

PHAR 8598	Proposal Preparation in Pharmacology	3
PHAR 8599	Doctoral Dissertation	15
Electives		14

Course Descriptions

Division of Biomedical Sciences and Graduate Program

Inter-Program Courses

CBIO 8500 - Statistics for the Biomedical Sciences. Three (3) credits.
Statistics as an art and a science. Basic characteristics of Statistical Inference. Normal Poisson and other distributions. Stimulation of parameters. Central Limit Theorem. Sample distributions. Comparison of means, variances, proportions. Analysis of Variance, orthogonal polynomials. Partition of degree of freedom. Variance components. Correlations simple, multiple, partial. Regression. Goodness of fit test. Some special topics: Analysis of Covariance. Transformations. Biological Assay. Sampling and Experimental Methods. Sequential Methods. Follow up studies. Non-parametric methods.

CBIO 8501 - Transmission Electron Microscopy Techniques. Four (4) credits.
This course is designed to teach the basic Techniques of Transmission Electron Microscopy. The student will become familiar with fixation, embedding, sectioning, staining, and the use of the transmission electron microscope and dark room techniques. Extra time, other than scheduled, will be required by the student for individual laboratory practice.

CBIO 8505 - Cardiovascular Biology. Three (3) credits. Pre-requisites: Courses of Physiology, Biochemistry, and/or Molecular Cellular Biology.
The Cardiovascular Biology course is designed to cover the primary aspects of the Cardiovascular System. These include Genetics, Structure and Function at the Cellular Level, Physiopathology and Pharmacology of the most common cardiovascular disorders. The Cardiovascular Biology course will be useful in the education of graduate students, medical students and residents. It will complement the graduate student's education by putting them in contact with clinical aspects of cardiac pathologies. Likewise, the medical students and residents may complement their clinical formation with training in cellular and molecular aspects.

CBIO 8506 - Advanced Topics in Biomedical Sciences. One to three (1-3) credits.
This course presents the latest advances and recent research findings in biomedical sciences, principally in the areas of anatomy, biochemistry, microbiology, neuroscience, pharmacology and/or physiology. The discussion of the topics that will be presented will provide the student the opportunity to integrate knowledge between the above mentioned areas and with the knowledge previously acquired, also. The course will be taught through interactive lectures by invited speakers, visiting professors, and faculty from the Biomedical Sciences Division of the Medical Sciences Campus. Grading system: Passed (P), Not Passed (NP).

CBIO 8991- Ethics of Scientific Research: Fundamentals Concepts. One to three (1-3) credits.
Through lectures, discussions and case studies this course introduces graduate students to the fundamental issues in the ethics of conducting scientific research. Basic concepts such as scientific research, morality, ethics and scientific misconduct will be defined. The relevance of Ethics for scientists will be illustrated through the analysis of paradigmatic cases. The student will be introduced to the researcher's fundamental ethical duties in the protection of non-human research, human research participants, and the environment. Grading System: Passed (P), Not Passed (NP)

CBIO 8992 - Ethics of Scientific Research: Applied Topics. One to three (1-3) credits. Pre-requisites: CBIO 8991.
Through lectures and group discussions this course presents and analyses specific issues related to scientific integrity such as authorship and publication, scientific record keeping, data ownership and management,

peer review and mentorship. Behaviors related to research misconduct will be analyzed in depth. The course also presents and analyses specific issues related to intellectual property and the protection of human participants in scientific research. The course is intended to aware students about ethical issues in research in order to accomplish ethical behavior in their career. Grading System: Passed (P), Not Passed (NP)

Department of Anatomy

Master of Science with specialty in Anatomy (MS)
Doctor of Philosophy with specialty in Anatomy (PhD)

ANAT 8411 – Human Gross Anatomy I. Four (4) credits.
The course provides students with a basic understanding of the organization and three-dimensional gross structure of the human body, with emphasis on the relation between structure and function. At the end of the course, the student will have acquired knowledge of the segmental and compartmental organization of the human body, the basic organization and morphology of the vascular and lymphatic systems of the following regions of the body: body wall, limbs, and the organs of the thoracic cavity. The student will also understand surface anatomy and various imaging modalities. In the laboratory, the student will conduct dissection of these regions of a human cadaver, identifying and describing the structures and their relations to each other. The structured time of the course includes conferences, laboratory dissection and small group discussions.

ANAT 8412 – Human Gross Anatomy II. Four (4) credits. Pre-requisites: ANAT 8411
The course provides students with a basic understanding of the organization and three-dimensional gross structure of the human body, with emphasis on the relation between structure and function. At the end of the course, the student will have acquired knowledge of the segmental and compartmental organization of the human body, the basic organization and morphology of the vascular and lymphatic systems of the following regions of the body: abdomen, pelvis, perineum, neck, and head. The student will also understand surface anatomy and various imaging modalities of these regions. In the laboratory, the student will conduct dissection of these regions of a human cadaver, identifying and describing the structures and their relations to each other. The structured time of the course includes conferences, laboratory dissection and small group discussions.

ANAT 8501 - Human Gross Anatomy. Eight (8) credits.
The course provides students with a basic understanding of the organization and three-dimensional gross structure of the human body, with emphasis on the relation between structure and function. At the end of the course, the student will have gained knowledge of the segmental and compartmental organization of the human body, the basic organization and morphology of the vascular and lymphatic systems of all major organs and regions of the body, the musculoskeletal and peripheral nervous system, and all visceral organs. The student will also understand surface anatomy and various imaging modalities. In the laboratory the student will conduct a complete dissection of a human cadaver, identifying and describing the structures and their relations to each other. The course will be offered through lectures, laboratory dissection, small group discussions, and independent study.

ANAT 8503 - Human Embryology. Two (2) credits.
Human development mechanisms are emphasized in this lecture course, including congenital malformations. This course will provide the students with an understanding of the prenatal period of human development, particularly between fertilization and the end of the 8th prenatal week, from a developmental and clinical perspective. The student will also learn about the major abnormalities that can occur during early human development which can result in congenital malformations. The structured component of the course will be offered through lectures. It is expected the students will also spend time on independent study.

ANAT 8504 - Human Cell Biology and Histology. Four (4) credits.
Through lectures, group discussions and laboratory, the student will receive an introduction on: (1) the structure and function of the cell; and (2) the microscopic anatomy of human tissues and organs as visualized with light and electron microscopy. Emphasis will be placed on correlating the arrangement and structure of component cells with the function and physiology of the tissue/organ. After completion of the course a student should have: (1) knowledge of the normal microscopic structure of the cells, tissues, and organs of the human body; and (2) the ability to correlate structure and function in cells, tissues, and organs at both light and electron microscopic levels. The structured time of the course consists of lectures, group discussions and laboratory sessions. It is expected the students will also spend time on independent study.

ANAT 8505 - Human Neuroanatomy and Neuroscience. Five (5) credits.
The course includes study of the structure and function of individual nerve cells, basic anatomical connections and organization of the human central nervous system, as well as integrative and systems neuroscience. These topics are reinforced by laboratories in neuroanatomy/neuroscience as well as clinical correlation conferences in which physicians present clinical material related to basic neurosciences topics. The structured component of the course will be offered through lectures, laboratory experiences and small group discussions. It is expected the students will also spend time on independent study.

ANAT 8513 - Human Embryology I. One (1) credit.
Through interactive conferences, the student will acquire foundational knowledge on the mechanisms of development of the human body, from a clinical and structural perspective. This course will provide the student with an understanding of the process of gametogenesis, and the stages of the prenatal period of development of the human body between fertilization and embryonic development through the end of the 8th prenatal week, followed by the stages of fetal development of the integumentary, nervous, musculoskeletal, cardiovascular, and respiratory systems. The student will also learn about the major abnormalities that can occur during development which can result in congenital malformations.

ANAT 8514 - Human Embryology II. One (1) credit. Pre-requisites: ANAT 8513
Through interactive conferences, the student will acquire foundational knowledge on the mechanisms of development of the human body, from a clinical and structural perspective. This course will provide the student with an understanding of the process of the stages of fetal development of the gastrointestinal, urogenital, endocrine/reproductive systems, and of the structures of the head and neck. The student will also learn about the major abnormalities that can occur during development of these structures and systems which can result in congenital malformations. The second half of the course will focus on teaching basic concepts of developmental biology.

ANAT 8525 - Practice in Teaching. Two (2) credits. Pre-requisites: ANAT 8411-8412 or ANAT 8501, ANAT 8513-8514 or ANAT 8503, ANAT 8613-8614 or ANAT 8504, ANAT 8611-8612 or ANAT 8505.
Supervised practice of teaching methods in the various anatomical courses for Medical, Dental and Allied Health students.

ANAT 8526 - Practice in Teaching. Three (3) credits. Pre-requisites: ANAT 8411-8412 or ANAT 8501.
Supervised practice of teaching methods in the Human Gross Anatomy courses for Medical and Dental students, including dissection of the human cadaver.
ANAT 8528 - Topics in Anatomy. One to three (1-3) credits. Pre-requisites: Authorization of the Course Coordinator and Graduate Coordinator or Department Director.
Provides graduate students the means of obtaining credit for concentrated specialized courses of 18-54 hours of duration.

ANAT 8532 - Seminar and Journal Club. One (1) credit.
The course provides the students the experience of reading, presenting and discussing recent original articles from peer-reviewed scientific journals under the guidance and supervision of faculty.

ANAT 8591 - Special Problems in Anatomy or Neurobiology. One (1) credit. Pre-requisite: Authorization of the Course Coordinator, and the Coordinator or Director of the Graduate Program.
This course provides a means during an academic session (semester or summer) by which students may pursue relatively short special research projects that include laboratory work under the supervision of and through special arrangements with a department faculty member. Grading System : Passed (P), Not Passed (NP)

ANAT 8593 - Special Problems in Anatomy or Neurobiology . Three (3) credits. Pre-requisite: Authorization of the Course Coordinator, and the Coordinator or Director of the Graduate Program.
This course provides a means during an academic session (semester or summer) by which students may pursue relatively short special research projects that include laboratory work under the supervision of and through special arrangements with a department faculty member. Grading System : Passed (P), Not Passed (NP)

ANAT 8595 - Master's Thesis Research. Six (6) credits. Pre-requisites: Student should have approved all the department's core courses, including ANAT 8411-8412 or ANAT 8501, ANAT 8513-8514 or ANAT 8503, ANAT 8613-8614 or ANAT 8504, ANAT 8611-8612 or ANAT 8505, two sessions of ANAT 8532, and CBIO 8500, and have presented and obtained approval from the Thesis Committee for the projects research proposal.
Laboratory research work for Master's Thesis.

ANAT 8596 - Preparation of Proposal in Anatomy. Three (3) credits. Pre-requisites: Student should have approved all the department's core courses, including ANAT 8411-8412 or ANAT 8501, ANAT 8513-8514 or ANAT 8503, ANAT 8613-8614 or ANAT 8504, ANAT 8611-8612 or ANAT 8505, at least two sessions of ANAT 8532, and CBIO 8500.
This course offers essential information for the preparation of thesis or dissertation proposals integrating basic concepts of anatomical disciplines, theories and research strategies. Topics to be discussed include the development of specific aims, literature revision to develop a rationale and hypothesis for the proposal, analysis of preliminary results, and design of research methodology to evaluate the problems to be investigated. The central focus of the course will be to train students in writing of thesis or dissertation proposals, as well as applications for predoctoral fellowships from federal, private or public entities. In addition, potential pitfalls of proposed research will be discussed. Grading System: Passed (P), Not Passed (NP)

ANAT 8599 - Doctoral Dissertation Research. Fifteen (15) credits. Pre-requisites: Student should have approved all the department's core courses, including ANAT 8411-8412 or ANAT 8501, ANAT 8513-8514 or ANAT 8503, ANAT 8613-8614 or ANAT 8504, ANAT 8611-8612 or ANAT 8505, at least two sessions of ANAT 8532, and CBIO 8500, have presented and obtained approval from the Dissertation Committee for the project's research proposal, and have passed the qualifying exam.
Laboratory research work for Doctoral Dissertation.

ANAT 8611 – Human Neuroanatomy & Neuroscience I. Two (2) credits.
The course includes a global introduction on the central and peripheral nervous system, from the clinical and structural perspective, followed by the study of the structure, function, myelination and metabolism of individual nerve cells, their interconnections and the process of synaptic transmission, neurotransmitters and receptors, the anatomy, organization and function of the spinal cord, including all its ascending, descending

and local tracts, culminating with a global look at the organization and functioning of the peripheral nervous system. These topics are reinforced by clinical correlation conferences and small group discussion sessions in which physicians and scientists present material related to basic neurosciences topics. The structured component of the course will be offered through conferences and small group discussions.

ANAT 8612 – Human Neuroanatomy & Neuroscience II. Three (3) credits. Pre-requisites: ANAT 8611
The course includes the study of the meninges, venous and arterial circulation of the central nervous system (CNS), gross brain anatomy, including the structures and regions of the telencephalon, diencephalon, midbrain, and metencephalon, function and connectivity amongst CNS structures, the organization and function of the motor and somatosensory systems and of the special senses, and the cortex and higher-order functions. These topics are reinforced by demonstrations of neuroanatomy in human brains, clinical correlation conferences and small group discussion sessions in which physicians and scientists present material related to these basic neurosciences topics. The structured component of the course will be offered through conferences, demonstrations of neuroanatomy, and small group discussions.

ANAT 8613 – Human Cell Biology & Histology I. Two (2) credits.
Through conferences and microscopy discussion sessions, the student will receive an introduction on the structure and function of the cell and the microscopic anatomy of the following human tissues and organs: skin, epithelium, connective, neural, cartilage, bone, muscle, vessels of the circulatory system, blood, lymph, respiratory and urinary. Emphasis will be placed on correlating the arrangement and structure of cells with function and physiology of the tissue/organ. Upon completion of the course it is expected that the student will have: (1) knowledge of the normal microscopic structure of the cells, tissues, and organs of the human body; and (2) the ability to correlate structure and function in cells, tissues, and organs at both light and electron microscopic levels.

ANAT 8614 – Human Cell Biology & Histology II. Two (2) credits. Pre-requisites: ANAT 8613
Through conferences and microscopy discussion sessions, the student will receive an introduction on the structure and function of the cell and the microscopic anatomy of the following human tissues and organs: gastrointestinal system with its associated organs, endocrine and reproductive (male and female) systems, eye, and ear. Emphasis will be placed on correlating the arrangement and structure of cells with function and physiology of the tissue/organ. Upon completion of the course it is expected that the student will have: (1) knowledge of the normal microscopic structure of the cells, tissues, and organs of the human body; and (2) the ability to correlate structure and function in cells, tissues, and organs at both light and electron microscopic levels.

ANAT 8995 - Practice in Anatomical Dissection of the Human Body. One to three (1-3) credits. Pre-requisites: Student should have approved all the department's core courses, including ANAT 8411-8412 or ANAT 8501, ANAT 8513-8514 or ANAT 8503, ANAT 8613-8614 or ANAT 8504, ANAT 8611-8612 or ANAT 8505, at least two sessions of ANAT 8532, and CBIO 8500.
The purpose of this course is to provide the student the opportunity to carry out the dissection of a human cadaver with more time and more emphasis on attention to details and the organization of structures and the development of advanced dissection skills than what is possible during the basic human gross anatomy course. At the end of the course, the student will not only have strengthened his or her knowledge of the anatomy of the human body, but will also be better prepared to teach this discipline, particularly in courses requiring dissection. The student will dissect a human cadaver in an independent manner, following the guidelines and instructions provided by the course coordinator, who will also provide assistance and direct supervision in the laboratory at periodic times and/or as is required by each student. Grading System: Passed (P), Not Passed (NP)

ANAT 8996 - Research Laboratory Rotations in Anatomy Program. One to three (1-3) credits.
This course offers students the opportunity of working for specific periods of time in one or various research laboratories of the department of anatomy and neurobiology, with the goal of learning first-hand about projects, types of experiments, experimental techniques, animal models, and work styles and dynamics of different laboratories and investigators. The purpose is also that both students and investigators get an idea of their options for developing what eventually will become new master's thesis or doctoral dissertation projects. Grading System: Passed (P), Not Passed (NP)

Department of Biochemistry

Master of Science with specialty in Biochemistry (MS)
Doctor of Philosophy with specialty in Biochemistry (PhD)

BCHM 8500 - Biochemistry. Six (6) credits.
This course is designed specifically for graduate and professional students with interests in laboratory research. This will be a lecture course in general biochemistry. Topics to be covered include catabolic and anabolic pathways in living organisms, nucleic acid, protein, carbohydrate, and lipid structures and functions, the basics of DNA, RNA, and protein synthesis, enzyme kinetics, photosynthesis, electron transport, biochemical endocrinology, physiological biochemistry (including excitable membranes, blood biochemistry, and allosteric effectors), and organ specific biochemistry. Selected topics will be assigned to self-learning, small group discussion and/or problem solving.

BCHM 8502 - Molecular Biology. Three (3) credits.
A research oriented lecture course in Molecular Biology. Topics to be covered include Biophysics of Macromolecules; Recombinant DNA and Biotechnology; Regulation of Transcription, including considerations of promoters, DNA Binding Proteins and Oncogenes; The Processing of RNA including capping, splicing, polyadenylation and editing, Translation including targeting, frame shifting, folding and post translational modifications; and Applications of Biochemical Genetics and Cell Biology. Resource material will be scholarly scientific publications. (For a state of arts, research oriented course, the specific topics to be considered will vary from one semester to the next in order to enable the most important and latest scientific discoveries to be covered).

BCHM 8504 - Biochemistry of Proteins. Three (3) credits.
The structure and function of various proteins (i.e. antibodies, enzymes, nucleic acid, binding proteins, cytoskeletal proteins, and membrane associated proteins) will be examined in detail. Protein folding, denaturation, and refolding will be reviewed. Applications of site directed mutagenesis, nuclear magnetic resonance, X-Ray crystallography, and molecular modeling will be covered. Enzyme kinetics will be examined in detail with emphasis on the analyses of catalytic mechanisms, subunit interactions, allosteric effectors, and inhibitors. sieve, affinity, and high pressure liquid column chromatography, Western Blotting, mass spectrometry, Edmon degradation, composition analyses, S.D.S. gel electrophoresis, isoelectric focusing, and PKA determinations, and other procedures that are used in the purification and analysis of proteins will be considered.

BCHM 8506 - Membrane Biochemistry. Three (3) credits. Pre-requisites: BCHM 8500 and/or completed graduate level Biochemistry/Physiology/Biology course.
This is an advanced Biochemistry course focusing on biomembranes. The following topics will be discussed: 1) Membrane structure; 2) Approaches to study membrane dynamics; 3) Membrane transport (influx/efflux) and transporter protein; 4) Excitable membrane, pump, and ion channel; 5) Membrane component biogenesis and their trafficking; and finally 6) Liposomes for targeted delivery of membrane impermeable drugs, macromolecules, etc. of therapeutic interest. This is a highly specialized course dealing with

membranes from higher eukaryotic cells. The students will be engaged in classroom lectures/exercises for 3 hours per week.

BCHM 8507 - Special Biochemical Laboratory Techniques I. Three (3) credits.
This is a tutorial-type course, where the student rotates in different laboratories of the department, and research is supervised by different faculty members. In this experience, the student will acquire laboratory skills and conduct his first experiments. The purpose of these rotations will be to expose the student to the research he/she likes. At the end of the course, the student should be ready to decide on his/her research and to begin writing the thesis proposal.

BCHM 8511 - Biochemistry I: Structure, Function, Processes, and Reactions. Three (3) credits.
This course deals with the structure and function of biomolecules, including proteins, enzymes, nucleic acids, lipids, carbohydrates, vitamins, hormones and regulatory compounds of diverse chemical nature. It emphasizes the biochemical processes that govern the transformations, interactions, and energy changes of these biomolecules in the different cells of an organism. It also discusses the mechanisms that allow the cells to become adapted to ever-changing environmental conditions and to differentiate during development. Catabolic and anabolic reactions are described in some detail. The particular role of mitochondria in the production of "high energy" compounds is analyzed. Emphasis is given to integration of the metabolism of the different compounds and how hormones and the central nervous system participate in the modulation of this process.

BCHM 8512 - Biochemistry II: Understanding the Human Genome and its Implications. Pre-requisites: BCHM 8511. Three (3) credits.
This course is designed specifically for graduate and professional students with interests in laboratory research. The course deals with the structural and functional characteristics of the human genome, the mechanisms of replication and repair of the genetic material, transcription, translation and regulation of the expression of genetic information (molecular biology), the alteration of genetic material (mutations), and its consequences (genetic diseases and molecular evolution), and the modern methods and techniques of molecular biology (recombinant DNA technology, gene therapy, and cloning). Basic concepts of human nutrition are also discussed.

BCHM 8515 - Enzyme Kinetics and Mechanism. Two (2) credits. Pre-requisite: BCHM 8500.
In this course the students will work with the concepts and applications of enzyme mechanisms with emphasis on the key kinetic and thermodynamic concepts that rule the activity of enzymes steady state kinetics, transient kinetics, mechanisms of catalysis, and mechanisms of inhibition. Methods to elucidate kinetic and chemical mechanisms will be explored such as kinetic isotope effect, spectroscopy and stopped-flow techniques. The students will have hands-on experience in the analysis of data by using software for kinetics research.

BCHM 8517 - Physical Chemistry of Macromolecules. Three (3) credits.
Through lectures and group discussions topics such as electrostatic theory, classical thermodynamics, properties of solutions, and electrolyte theory, are studied. Transport processes such as diffusion and its variants, the resulting effects (such as osmotic pressure), sedimentation theory, viscosity and electrophoresis are topics that will be discussed. In this course, students also have the opportunity to study the subjacent theory of the effects of radiation on molecules such as absorption, fluorescence, magnetic resonance, dispersion, dichroism, dispersion and diffraction of X-rays.

BCHM 8521 - Practice and Teaching of Biochemistry. Three (3) credits.
Students registered in this course conduct class discussions under the supervision of a faculty member. These discussion groups are made of a minimum of twelve, First Year dental or medical students and are part of the

course work required in the respective Biochemistry courses offered to dental or medical students. Graduate students in charge of the discussions lead the group, prepare self-evaluation quizzes for the students, reports to faculty members their observations as to the proficiency of students under their supervision. Two group discussions per week. The course is open only to graduate students registered in the Department of Biochemistry and Nutrition.

BCHM 8525 - Recent Advances in Biochemistry and Molecular Biology. Two (2) credits.
Recently published scientific literature will be discussed on a weekly basis through oral presentations made by the course participants followed by group discussions. Topics relevant to diverse aspects of Biochemistry and Molecular Biology will be discussed.

BCHM 8526 - Proposal. Three (3) credits.
This is a graduate course in which the students will plan and develop a proposal for their dissertation or other research project. During the course and under the supervision of a faculty member, the student will select a research theme, write the objectives of the research, and develop the proposal. They will submit the written proposal to the supervising faculty member who will approve or disapprove the completed proposal. This course, in conjunction with a graduate seminar course confers regular student status.

BCHM 8527 - Special Topics in Biochemistry. One (1) credit.
This will be a short intensive course on a special topic in Biochemistry that will be offered by visiting professors. Recent research findings will be emphasized. The format may vary from lectures with assigned reading, discussions, and/or laboratory exercises.

BCHM 8528 - Special Topics in Biochemistry. One (1) credit.
This will be a short, intensive course on a special topic in Biochemistry that will be offered by visiting professors. Recent research findings will be emphasized. The format may vary from lectures to lectures with assigned reading, discussions, and/or laboratory exercises.

BCHM 8529 - Special Topics in Biochemistry. One (1) credit.
This will be a short intensive course on a special topic in Biochemistry that will be offered by visiting professors. Recent research findings will be emphasized. The format may vary from lectures to lectures with assigned reading, discussions, and/or laboratory exercises.

BCHM 8530 - Regulation of Gene Expression in Eukaryotes. Three (3) credits. Pre-requisite: BCHM 8500 or BCHM 8511 and BCHM 8512.
This course is about fundamental aspects of molecular biology and regulation of gene expression. It includes the structure and properties of genetic material, epigenetic modifications, and the role of transcription factors in regulation of gene expression. It also analyzes aspects of regulation at the level of translation. The projections of some of these fundamentals aspects in medicine are discussed.

BCHM 8531 - Research Seminar Series I. One (1) credit.
This Seminar Series will meet an average of once per week throughout the semester, for approximately 1.0-1.5 hours during which doctoral level scientists will give presentations about their research investigations or about subjects relevant to pursuing a career in science.

BCHM 8532 - Research Seminar Series II. One (1) credit.
This Seminar Series will meet an average of once per week throughout the semester, for approximately 1.0-1.5 hours during which doctoral level scientists will give presentations about their research investigations or about subjects relevant to pursuing a career in science.

BCHM 8533 - Research Seminar Series III. One (1) credit.
This Seminar Series will meet an average of once per week throughout the semester, for approximately 1.0-1.5 hours during which doctoral level scientists will give presentations about their research investigations or about subjects relevant to pursuing a career in science.

BCHM 8534 - Research Seminar Series IV. One (1) credit.
This Seminar Series will meet an average of once per week throughout the semester, for approximately 1.0-1.5 hours during which doctoral level scientists will give presentations about their research investigations or about subjects relevant to pursuing a career in science.

BCHM 8535 - Research Seminar Series V. One (1) credit.
This Seminar Series will meet an average of once per week throughout the semester, for approximately 1.0-1.5 hours during which doctoral level scientists will give presentations about their research investigations or about subjects relevant to pursuing a career in science.

BCHM 8536 - Research Seminar Series VI. One (1) credit.
This seminar series will meet an average of once per week throughout the semester, for approximately 1.0-1.5 hours during which doctoral level scientists will give presentations about their research investigations or about subjects relevant to pursuing a career in science.

BCHM 8550 - Introduction to Human Biochemistry. Six (6) credits.
Topics covered include introduction to the Physical Chemistry of Molecules of biological interest, enzymology, biological oxidations, metabolism of the main group of nutrients, biosynthesis of cell constituents, with emphasis in biosynthesis of proteins, regulation of cellular processes, nutrition seen from the molecular point of view, role of plasma proteins on body physiology, an introduction to Immunochemistry and respiration and acid base balance.

BCHM 8551 - Methods in Protein and Nucleic Acid Biochemistry. Two (2) credits.
This laboratory course will meet once a week during which there will be lectures and laboratory exercises with possible follow-up requirements. Procedures to be covered include the purification of proteins and nucleic acids, restriction analysis of DNA, polymerase chain reaction (PCR) sieve and/or ion exchange chromatography, HPLC chromatography, gel electrophoresis, ultra-centrifugation, UV/Visible Spectrophotometry, and Scintillation Spectrometry.

BCHM 8552 - Methods in Lipid and Carbohydrates Biochemistry, Nutrition, and Biochemical Pharmacology. Two (2) credits.
This laboratory course will meet once a week during which there will be lectures and laboratory exercises with possible follow-up requirements. Focus will be directed toward metabolic aspects of lipid and carbohydrate chemistry including nutrition. Techniques employed will include use of radioisotopes, radio immunoassay, differential centrifugation, Spectrophotometry, and dietary analysis utilizing computerized programs. Other procedures covered will be separations of mono-, di-, and oligosaccharides, digestion of exo- and endoglycosidases, thin layer Chromatography, molecular sieve and/or ion exchange Chromatography, HPLC, Periodic Acid-Schiff's (PAS) Staining, and lectin blots.

BCHM 8557 - Protein Modification. One (1) credit.

BCHM 8559 - Investigations in Angiogenesis I. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research to study the Biochemistry of Angiogenesis. For this course the student will study the biochemistry of differentiation of capillary endothelial cells. Studies will include screening of angiogenic factors affecting capillary endothelial

cell proliferation, the mapping of cell cycle, and the characterization of factors responsible for cell proliferation and differentiation. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8560 - Investigations in Angiogenesis II. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research to study the Biochemistry of Angiogenesis. For this course the student will identify the gene products responsible for endothelial cell proliferation and capillary formation. Translational regulation of the process will be studied and any modification at the Pre-Golgi compartment will be examined. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8561 - Investigations in Complex Carbohydrates Biochemistry I. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in Complex Carbohydrate Biochemistry. For this course the student will identify a glyco-conjugate and its glycan structure as a complex, high-mannose or hybrid type will be determined. Enzymatic and chemical methods will be followed for the structural studies and the role of the carbohydrate residues for biological function will be determined. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8562 - Investigations in Complex Carbohydrates Biochemistry II. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in Complex Carbohydrate Biochemistry. For this course the enzymatic synthesis and subsequent processing of the glycan chains in the Post-Golgi compartment and network will be investigated. In vitro assays of glycosyltransferases will also be performed to understand the regulatory events. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8563 - Investigations in Enzyme Biochemistry I. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in Enzyme Biochemistry. For this course the student will purify and study native or recombinant enzymes. Studies will include specific activity determinations during purification and analyses of the steady state kinetics of enzyme catalyzed reaction for the purified enzyme. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8564 - Investigations in Enzyme Biochemistry II. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in Enzyme Biochemistry. For this course the student will use various screening procedures, enzyme assays, and kinetic studies to identify potential ligands and inhibitors of an enzyme. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8565 - Investigations in Filamentous Proteins I. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in the Structure and Function of Filamentous Proteins. This course will include studies in identification, isolation, and mutagenesis of selected DNA regions encoding a portion of a filamentous protein. These selected DNA fragments will be obtained by PCR techniques from a cloned DNA template. Mutations generated will be confirmed by direct DNA sequencing of the mutated DNA fragment. The resulting experiments will inquire into the role of specific amino acids in the function and control of filamentous proteins. These studies will be

expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8566 - Investigations in Filamentous Proteins II. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in the Structure and Function of Filamentous Proteins. Mutated filamentous protein gene(s) will be used for generating chromosomal mutants. This course will include studies in the functional analysis of filamentous proteins mutants through assays for secretory function, distribution of cell polysaccharides and cytoskeletal proteins, protein phosphorylation of the mutant protein, and effects on cell division. The course will incorporate the techniques of Fluorescence Microscopy, for analysis of immunochemical and other protein specific dyes, and immunoprecipitation of radiolabelled filamentous proteins. These experiments will generate novel information on the function of filamentous proteins in non-muscle cell systems. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8569 - Investigations in Membrane Biochemistry I. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in Membrane Biochemistry. This course will provide training in the procedures to investigate cell membrane fluidity as well as chemical composition, and external factors that modify these parameters (i.e. diet, drugs, Ethanol and/or toxic agents). EPR and lipid analysis by HPLC will be used. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8570 - Investigations in Membrane Biochemistry II. Six (6) credits.
This course will involve training in how to design, conduct and analyze independent research in Membrane Biochemistry. This course will give students the opportunity to prepare membrane cell components such as mitochondria, plasma membranes and microsomes or membrane derivatives such as liposomes, synaptosomes or synaptoneurosomes and to study the biological activities of proteins (i.e. receptors, ion channels) associated with the membranes. Ligand binding, ion uptake, enzyme activity, HPLC and EPR will be among the procedures employed for these investigations. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8571 - Investigation in Molecular Genetics I. Six (6) credits.
This course will involve training in how to design, conduct, and analyze experiments in molecular genetics. For this course, students will learn and acquire hands on experience in bacterial culture and the use of prokaryotic and eukaryotic cloning vectors. Cloning from a genomic or CDNA library, and physical characterization of selected DNA will be performed using procedures such as restriction mapping and DNA sequencing. Computer aided analysis of DNA and amino acid sequences will be used. These studies will provide information leading to the identification of gene sequences from a variety of organisms. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8572 - Investigations in Molecular Genetics II. Six (6) credits.
This course will involve training in how to design, conduct, and analyze experiments in molecular genetics. In this course, students will participate in the generation of mutant cells by site specific recombination of mutant constructs introduced into diploid yeast cells. The mutant gene constructs will be generated by the students in the laboratory by the deletion and/or insertion of DNA or DNA markers respectively into a selected target gene clone. Traditional transformation and electroporation techniques will be used for generation of mutants. Candidate mutant cells will be analyzed by diagnostic Southern Blot and PCR analysis

of genomic DNA. Techniques for genetic analysis of gene function through analysis of haploid cells will be applied. The results of these experiments will generate novel mutants that will reveal information on gene structure-function relationships.

BCHM 8573 - Investigations in Nucleic Acid Biochemistry I. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in Nucleic Acid Biochemistry. For this course the student will clone and sequence a gene or CDNA of interest. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8574 - Investigations in Nucleic Acid Biochemistry II. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in Nucleic Acid Biochemistry. For this course the student will purify and study a native or recombinant nucleic acid. Studies may involve the synthesis, evaluation, and/or probing of a genomic or CDNA library. These studies will be expected to answer new questions and to generate novel data as opposed to reproducing experiments that have been performed before.

BCHM 8578 - Investigations in Protein Structure/Function I. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in Protein Structure/Function Relationships. Methods employed will involve investigations of the functional roles of specific amino acids in substrate binding and catalytic mechanism of a recombinant enzyme using techniques such as site directed mutagenesis. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8579 - Investigations in Protein Structure/Function II. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in Protein Structure/Function Relationships. In this course students will learn to grow x-ray diffraction quality protein crystals. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8580 - Investigations in Tumorigenesis I. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in the area of Tumorigenesis. In this course students will search for genetic alterations during development of the malignant phenotype. Methods employed will involve state of the art procedures in Molecular Biology. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8581 - Investigations in Tumorigenesis II. Six (6) credits.
This course will involve training in how to design, conduct, and analyze independent research in the area of Tumorigenesis. In this course students will search for molecular alterations during development of the malignant phenotype. Methods employed will involve state of the art procedures in Molecular Biology. These studies will be expected to answer new questions and to generate novel data, as opposed to reproducing experiments that have been performed before.

BCHM 8595 - Research for Master's Thesis. Six (6) credits.
A requirement for all students registered for a Master of Science with concentration in Biochemistry and Nutrition.

BCHM 8599 - Research for Doctoral Thesis. Fifteen (15) credits.
A requirement for all students registered for a Doctor of Philosophy Degree with concentration in Biochemistry and Nutrition. Grading system: Since the Graduate Class 1998-1999 the grading system is P or F (Passed or Fail). Research project approval from Dissertation Committee required.

BCHM 8695 - Cooperative Workplace Internship. Nine (9) credits. Pre-requisites: Approval of all required courses of 1rst and 2nd year of doctoral program, successful approval of the comprehensive exam, BCHM 8526, BCHM 8530 or other equivalent elective course of 3 credits.
This course is addressed to graduate students of Biomedical Sciences. It will provide the participant student with the opportunity to integrate and apply developed skills and acquired knowledge and in a real scenario through a valuable work experience. In addition, this course will offer a unique opportunity to establish a network within the local workforce, and facilitate the flow of students from the academic program to careers performance in Biomedical Sciences. The terms of employment will be negotiated between the student and the approved sponsoring institution. The student will be fully immersed in the work environment; therefore, this course will provide full-academic load to him/her. Participation in the course is limited to one academic semester and it requires written full consent of the Department of Biochemistry Chair and the student's thesis advisor.

BCHM 8995 - Special Topics in Biochemistry. One to three (1-3) credit(s).
This is a course of variable length, intensive, on special topics in Biochemistry that will be offered by visiting professors or Biochemistry faculty. Recent research findings in the Biochemistry area will be emphasized. The format may vary from lectures to lectures with assigned readings, discussions, and/or practical exercises.

Department of Physiology

Master of Science with specialty in Physiology (MS)
Doctor of Philosophy with specialty in Physiology (PhD)

FISA 8105 - Basic Concepts of Human Physiology. Three (3) credits.
Through interactive conferences, this course will offer basic physiological knowledge necessary to understand the essential concepts of human physiology. This course is designed for "non-Physiology" graduate students in order to have a basic understanding of the body function from the molecular, cellular and system levels. In this way, the students will acquire knowledge and develop the skills to integrate the function of the systems (Nervous, Muscular, Cardiovascular, Respiratory, Gastrointestinal, and Endocrine). The concepts presented in the course are, therefore, essential to the everyday research experience in any department of the basic sciences.

FISA 8215 - Advanced Physiology. Five (5) credits. Pre-requisites: FISA 8105.
This course is designed to provide graduate students with advanced knowledge in the area of vertebrate physiology, with emphasis on the physiology of human organs and systems. The course is a requirement for the master and doctoral students of the Physiology Department. Students from other graduate programs may take this course provided that they comply with the course prerequisites. The course consists of the following sections: Cell and Membrane Physiology, Neurophysiology, Cardiovascular Physiology, Respiratory Physiology, Renal Physiology, Gastrointestinal Physiology, Endocrine and Reproductive Physiology. The ultimate goal of the course is to enable students to understand complex physiological processes of vertebrates, in particular, humans, from the molecular to the organismal levels.

FISA 8500 - Human Physiology. Twelve (12) credits.
The course presents basic Human Physiology in detail.

FISA 8503 - Seminar in Physiology. One (1) credit.
The main objective of this course is to educate the students about the art of presenting a scientific seminar. During the course, students in consultation with a faculty member will choose a topic to prepare a presentation of high scientific interest. The seminar topic should be about the student's research project or a topic of interest. Seminars are designed, developed, and presented by the students following the advice from a faculty member. Also, students will have the opportunity to evaluate seminars given by their peers. Students will receive feedback on their presentations from peers and faculty.

FISA 8504 - Seminar in Physiology. Two (2) credits.

FISA 8510 - Biophysics. Three (3) credits. Pre-requisites: FISA 8105, FISA 8215.
This course is an in depth look at the Biology and Physics of ionic channels embedded on excitable membranes. Ionic channels are indispensable for the production and transduction of electrical signals in excitable cells. This course will attempt to merge classical principles and analogies of the biophysics of ionic channels with current areas of physiological research, specially, in the neurosciences. The properties and physiological functions of classical and newly discovered channels will be discussed and their significance in the central nervous system will be highlighted.

FISA 8511 - Seminar in Endocrinology. Two (2) credits. Pre-requisites: FISA 8105, FISA 8215.
This course offers recent information regarding Endocrinology above and beyond what is available in the basic Endocrinology textbooks. New advances in Endocrinology will be discussed in detail, depending on the students enrolled in the course. Students will pick topics of interest to them, research the topic in detail and present a seminar, or a group discussion of information contained in the collection of papers. All students will be required to read background information about each seminar topic in advance of the seminar. Students will normally discuss methodologies, which integrate basic concepts, theories and research strategies.

FISA 8512 - Cardiovascular Physiology. Two (2) credits. Pre-requisites: FISA 8105, FISA 8215.
A course on comparative Cardiovascular Physiology based on some of the most recent advances in the field. The course includes heart mechanics, Electrophysiology, Hemodynamics and regulation.

FISA 8513 - Advanced Exercise Physiology I. Three (3) credits. Pre-requisite: FISA 8105.
This course will address how the body adapts to exercise during acute and chronic time frames. It will also review and discuss terminology and concepts of cellular metabolism, muscle contraction, and neuromuscular function for enhanced understanding of acute and chronic adaptations to exercise. The course is concluded with a review of recent findings on various pharmacological, hormonal, physiological, and environmental agents known to either enhance or impair exercise performance. The course consist of three sections: Fundamentals of Exercise Physiology, Systemic Response to Exercise, and Aids to Exercise Performance.

FISA 8514 - Advanced Exercise Physiology II. Three (3) credits. Pre-requisite: FISA 8513.
This course by means of lectures, seminars, and laboratory experiences will review and discuss the latest research findings in Exercise Physiology/Biochemistry related to: fatigue, aging, gender, children, environmental conditions and genetics. It will also review the measurement of endurance, anaerobic capacity, strength and body composition as well as applications of Exercise Physiology to Exercise Testing. The course consist of three sections: Measurement of Physiologic Composition and Capacities, Special Topics within Exercise Physiology, and Exercise and Health.

FISA 8515 - Respiratory Physiology. Three (3) credits. Pre-requisites: FISA 8105, FISA 8215.
The course consists of both lecture and discussion sessions. Discussions are developed primarily to critical analyses of important scientific papers. Topics covered: (a) O2 and CO2 Exchange between the Atmosphere and Blood, with particular emphasis on the role of matching alveolar ventilation and pulmonary capillary diffusion; (b) Nervous and Chemical Regulation of Respiration. In addition, Exercise and/or Aviation Physiology will also be discussed.

FISA 8516 - Physiology of the Kidney and Body Fluids. Two (2) credits. Pre-requisites: FISA 8105, FISA 8215.
This course offers students the basic concepts of renal physiology, emphasizing the human kidney. The topics to be discussed include the distribution of body fluids, glomerular filtration, the control of sodium and water balance, and its regulation by the endocrine system, acid-base balance, and potassium balance. Besides, participating students will make presentations on published work in the area of renal physiology.

FISA 8518 - Mathematics for Biologists. Two (2) credits. Pre-requisites: FISA 8105, FISA 8215.
Studies of the following concepts: the function concept; function derivative; rules to obtain derivatives; exponential functions; integral calculus; geometric interpretation of derivatives; some differential equations. The course deals with concepts and methods applicable to analysis of data, specifically graphic data analysis, using software programs routinely used in research programs across the nation. The course also consists of hands-on experience in curve fitting, enzyme kinetics, pharmacologic analysis, and physiologic processes in general, including peak analysis.

FISA 8525 - Neurophysiology. Three (3) credits. Pre-requisites: FISA 8105, FISA 8215.
This course offers essential information of spinal cord circuits, neural development and plasticity, integrating basic concepts, theories and research strategies from different disciplines like Anatomy, Physiology, Biochemistry, Pharmacology, and Cell & Molecular Biology. Through lectures and group discussions of specific topics recently published in scientific journals the student will analyze neural development and behavior of the nervous system from a biochemical, and cellular and molecular standpoint. In this way, the student may understand the basic molecular, cellular and physiological concepts of the central nervous system in relationship with neurodegenerative diseases like Alzheimer, Parkinson, epilepsy and trauma, and the function of the nervous system in regulating other systems such as muscular, cardiovascular, respiratory and gastrointestinal.

FISA 8526 - Seminar on Brain and Behavior. Three (3) credits. Pre-requisites: FISA 8105, FISA 8215.
The main focus of this course is to examine the neural basis of behavior. The first three lectures will provide background material from a systemic to a molecular approach. Processes that occur at the level of brain, cell and gene, and their contributions to the control of behavior, will be discussed. We will then examine the chemicals that serve to communicate information between neural cells, i.e. neurotransmitters. Classical, non-classical (neuropeptides) and unconventional neurotransmitters such as nitric oxide, will be studied. This will be followed by the presentation of different behaviors such as: Feeding, Play, Aggressive, Learning, Sexual and Maternal Behavior. These behaviors will be studied in a variety of animals, so that we can gain insight to the diversity of existent behavioral patterns. The focus of our discussions will be on the neural regulation of these behaviors including brain region, neurotransmitters, neural circuitry, and receptor pharmacology. Other factors that affect the expression of a behavior, such as hormonal status, age, gender and genetic composition, will be considered during our discussions. Deviations from “normal” behavioral patterns will be studied by discussions of recent scientific articles lead by students of the course. By discussing scientific articles in the areas of anatomy, physiology, pharmacology, ethology , development and genetics we hope that students will gain a better understanding of the multifaceted interactions that regulate the expression of behavior.

FISA 8531 - Physical Instrumentation for Biologist. Two (2) credits.

FISA 8532 – Instrumentation and Methodologies used in Biomedical Research. Three (3) credits.
The course is designed to provide a basic working knowledge of physiological, biophysical, biochemical, and molecular techniques used in biomedical research. The overall goal is to provide students with an understanding of methodical approaches that can be used in animals-and cell-based studies as well as in the evaluation of human tissues. The course begins with a discussion of basic principles of electricity, circuits and signal recording and transducers. The course then addresses main principles of molecular biology techniques for protein and gene analysis in cell/tissue samples followed by an in-depth introduction to confocal microscopy, patch-clamp techniques, proteomics, analysis, and fluorescence-activated cell sorting (facs). The course consists of lectures, hands-on laboratory sessions and demonstrations.

FISA 8540 - Cellular Molecular Physiology. Three (3) credits. Pre-requisite: BCHM 8511 (or its equivalent)
This course will provide students with basic concepts of Cell Physiology from a molecular point of view. Three main areas will be presented: 1) Physiological Genomics (gene structure and chromatin organization, DNA repair, regulation of gene expression, RNA splicing, and RNA translation); 2) Cellular Physiology (intracellular compartments, protein synthesis and sorting, vesicular trafficking and final targeting to organelles or structures such as endoplasmic reticulum, Golgi apparatus, plasma membrane, lysosome and nucleus); 3) Mitochondrial Physiology (mitochondrial genetics, protein import, respiration and apoptosis); 4) Physiology of Aging (model organisms, molecular genetics of aging in higher eukaryotes). In addition, some time have been dedicated to receptor regulation at the transcriptional, posttranscriptional, translational and postranslational level. Finally, the course will cover cellular processes that are related to proteins involved in cell communication and cytoskeletal proteins. The material will be presented as lectures and presentation of specific recent publications. The final goal of this course is to teach the students the molecular basis of Cell Physiology. A strong emphasis will be given to the understanding of the different experimental approaches and techniques available for studying problems in the above-mentioned areas. Also, students will develop skills in the critical analysis of scientific literature.

FISA 8541 – Laboratory Rotation. Three (3) credits.
Topics assigned for laboratory work, conferences, and reading. The final goal in this course is that students may choose a thesis project to develop during the graduate training and select an advisor that will supervise their academic and scientific progress. The graduate students will rotate in two laboratories of investigators in the Physiology Department for a period of 9 weeks in each laboratory. The rotations are periods of scientific training in laboratories of the Physiology Department, selected by the student. Each credit is equivalent to 5 hours of research work per week (135 research hours/9 weeks of rotation). During these rotations, the students will learn research techniques related to a specific project and the rationale to perform those experiments. These rotations should be performed with different members of the Physiology faculty, in order to obtain more diversity among the research areas in the Department. The final goal in this course is that students may choose a thesis project to develop during the graduate training and select an advisor that will supervise the student academic and scientific progress.

FISA 8542 - Directed Reading. One (1) credit.
This course offers recent information regarding Physiology above and beyond what is available in the basic textbooks. New advances in Physiology will be discussed in detail, depending on the students enrolled in the course. Students will pick topics of interest to them, research the topic in detail and present a seminar, or a group discussion of information contained in the collection of papers. All students will be required to read background information about each seminar topic in advance of the seminar. Students will normally discuss methodologies, which integrate basic concepts, theories and research strategies.

FISA 8543 - Problems in Physiology II. Three (3) credits. Pre-requisites: FISA 8105, FISA 8215, FISA 8541.
Special topics assigned for laboratory work, conferences, and lectures. This course offers the opportunity to examine recent information in the various areas of physiology and supplement that provided in the literature. New advances in physiology will be discussed in detail. Students will pick topics of their interest to research and present as a seminar or group discussion. Students will integrate basic concepts, theories, discuss methodologies and research strategies. All participating students are expected to read background information in advance and to actively participate in class discussions. Laboratory exercises may be integrated to the course depending on the topic of discussion.

FISA 8551 - Problems in Physiology III. Three (3) credits. Pre-requisites: FISA 8105, FISA 8215, FISA 8543.
Topics will be assigned for laboratory work, lectures, and reading in any of the areas of Physiology.

FISA 8552 - Problems in Physiology IV. Three (3) credits. Pre-requisites: FISA 8105, FISA 8215, FISA 8551.
Topics will be assigned for laboratory work, lectures, and readings in any of the areas of Physiology.

FISA 8585 - Preparation of Physiology Proposal. Three (3) credits. Pre-requisites: Approved the credits required for the Master or Doctoral Program (except the Thesis) of the Physiology Department and the Comprehensive Test of the Department.
This course offers essential information to the qualify examination and for the preparation of thesis proposals integrating basic concepts of Physiology, theories and research strategies. Topics to be discussed include the development of specific aims, evaluation of literature to develop a rationale for the proposal, analysis of preliminary results, and design of research methodology to evaluate the problems to be investigated. The central focus of the course will be to train students for the comprehensive exams and for the writing of thesis proposals and federal predoctoral fellowships. In addition, potential pitfalls of proposed research will be discussed. The material will be presented by the students as discussions of specific topics recently published in scientific journals and review of literature related to the specific student proposal.

FISA 8595 - Master's Thesis. Six (6) credits.
Research work in a laboratory for the completion of a Master thesis. This course provides the student with training in all areas of scientific research. The student, under the guidance of a mentor and the members of the thesis committee, formulates a hypothesis and designs experiments to prove or disprove the hypothesis according to the scientific method. During this process, the student is expected to become an expert in laboratory techniques, experimental design, and data analysis. Effective communication and teaching skills are expected to be developed during this process.

FISA 8599 - Doctoral Thesis. Fifteen (15) credits.
Laboratory work directed towards the completion of a doctoral thesis. This course provides training in all aspects of the scientific investigation. The student, under the guidance of his mentor and the thesis committee formulates a hypothesis and then designs experiments to prove or disprove this hypothesis according to the scientific method. During this process the student is expected to become an expert in experimental design, laboratory techniques and data analysis. Effective communication and teaching skills are expected to be developed during this process.

FISA 8601 - Vertebrate Physiology I. Four (4) credits.
This course is designed to offer students the basic concepts in Vertebrate Physiology, emphasizing the human vertebrate. The course develops from the cell, discussing membrane properties and the Physiology of muscle cells, and continues with a discussion of the two integrative systems: The Nervous and Endocrine Systems. The final portion of the course is dedicated to discuss Reproductive Physiology and its neuroendocrine regulation. Different educational strategies will be used throughout the course, such as group discussions, lectures, and student presentations. Computer demonstrations will be used in some topics. The course is

recommended for all master and doctoral students of the Physiology Department and for all doctoral students of the Departments of Anatomy and Pharmacology. Students from the Intercampus Doctoral Program of the Biology Department of the University of Puerto Rico, Rio Piedras Campus are allowed to register in the course.

FISA 8602 – Vertebrate Physiology II. Four (4) credits.
This course is designed to provide graduate students with basic knowledge in the area of vertebrate physiology. This course, which is a continuation of Vertebrate Physiology I, provides graduate students in physiology and other basic sciences with a fundamental knowledge of the physiology of the principal human organs and systems. The course will consist of the following 5 sections: Cardiovascular Physiology, Respiratory Physiology, Renal Physiology, Gastrointestinal Physiology, and Special Topics in Physiology. The ultimate goal of the course is to enable students to further understand the basic physiological processes of vertebrates, in particular, humans. This course is recommended for all master and doctoral students in the Physiology Department, and for all doctoral students in Anatomy and Pharmacology. Students from the Intercampus Doctoral Program of the Biology Department of the University of Puerto Rico, Rio Piedras Campus are also allowed to register in this course.

FISA 8605 - Teaching Assistantship in Physiology. One (1) credit. Pre-requisites: FISA 8105, FISA 8215 or MPRI 7120. Approved the doctoral qualify examinations.
This is a practical course which will provide the doctoral student, who has approved his/her qualify examinations, the academic experience of teaching other junior graduate and medical students in diverse fields of Physiology, under the supervision of a facultative of Physiology. The student will propitiate the discussion of the diverse topics of Physiology presented in the course, through case presentations and laboratories elaboration. The student will be in charge of the presentation and delivery of the following topics: cellular & membrane physiology, neurophysiology, cardiovascular, respiratory, acid-base, renal, gastrointestinal and endocrinology. The student will also prepare two laboratories to graduate and medical students. The first one deals with cardiovascular physiology, and the second one is focused on respiratory physiology. Grading System: Passed (P), Not Passed (NP)

Department of Microbiology

Master of Science with specialty in Microbiology (MS)
Doctor of Philosophy with specialty in Microbiology (PhD)

MICR 8496 - Introduction to Research. One (1) credit.
The purpose of this course is to introduce the first-year student to the disciplines and research projects that are being conducted in different laboratories of Microbiology of the School of Medicine of the Medical Sciences Campus. This exposure will enable the student to become familiar with the area of emphasis of each laboratory, the experimental design of research projects being conducted, obtain hands-on experience with the techniques and instrumentation used and have the chance to actively participate in some on-going experiments and demonstrations. Moreover, the student will have the opportunity to participate in scientific discussions with each Laboratory Director, other Principal Investigators, laboratory personnel and other graduate students. This exposure will allow the students to identify, early in his/her training period, the preferred discipline and specific area for student's Dissertation Project and a potential Dissertation Advisory/Director. Grading System: Passed (P), Not Passed (NP)

MICR 8499 - Introduction to Medical Microbiology. Six (6) credits.
General microbial physiology, microbial genetics, and the study of different disease producing agents: bacteria, viruses, fungi and parasites. The organisms are studied in relation to their particular characteristics, methods of cultivation, the pathological processes in which they are involved, and the immunological host responses.

MICR 8504 - Advanced Topics in Medical Bacteriology. One (1) credit. Pre-requisite: MICR 8499.
Topics of interest related to Medical Bacteriology will be discussed. The faculty have to approve the topics. Can be taken more than once, up to 3 credits.

MICR 8505 - Advanced Topics in Medical Bacteriology. Three (3) credits. Pre-requisite: MICR 8499.
Topics of interest related to Medical Bacteriology will be discussed. The faculty have to approve the topics. Can be taken more than once, up to 3 credits.

MICR 8506 - Advanced Topics in Medical Bacteriology. Three (3) credits. Pre-requisite: MICR 8499.
Topics of interest related to Medical Bacteriology will be discussed. The faculty have to approve the topics. Can be taken more than once, up to 3 credits.

MICR 8510 - Virology. Three (3) credits. Pre-requisites: BCHM 8500, MICR 8499.
The main characteristic of the viruses will be covered in this course and the student will learn how viruses cause diseases. The topics to be covered include: structure, replication and virus evolution, in addition to pathogenesis, immune response, diagnosis, treatment, and prevention of viral diseases. The course will be taught thru lecturing and group discussions.

MICR 8514 - Advanced Topics in Virology. One (1) credit. Pre-requisites: MICR 8499, MICR 8510.
Topics of interest related to Virology will be discussed. The faculty has to approved the topics.

MICR 8515 - Advanced Topics in Virology. Two (2) credits. Pre-requisites: MICR 8499, MICR 8510.
Topics of interest related to Virology will be discussed. The faculty has to approved the topics.

MICR 8516 - Advanced Topics in Virology. Three (3) credits. Pre-requisites: MICR 8499, MICR 8510.
Topics of interest related to Virology will be discussed. The faculty has to approve the topics.

MICR 8517 - Advanced Selected Topics in Microbiology. One (1) credit.
Current selected topics of Microbiology will be covered by one or more members of the staff or by visiting professors. The topics to be covered must be approved by the departmental faculty. This course can be taken more than once in different semesters up to a maximum of three.

MICR 8518- Human Microbiomes. Two (2) credits.
The microbial communities associated with the human body, influence our health and our quality of life. This intensive course on Human Microbiomes, will cover the ecology of the microbial inhabitants of the human body, their evolution and biodiversity. Topics include the concept of human superorganism (holobiont); multi-domain organisms, microbiome and evolution; ecological principles of microbiomes; bioinformatics and multi-omics tools for microbiome research; intestinal microbiomes or microbiome and cancer. Lectures, visual media, group discussions/projects, writing and oral presentations are some of the effective resources used to engage students in learning about the human microbiome.

MICR 8519 - Biotechnology and Experimental Immunology. Three (3) credits.
This intensive course is designated for PhD and MSc students of the Graduated Program of Microbiology who are interested in developing practical skills in basic techniques for handling and characterization of genes, expression and purification of protein antigens as well as in the development and optimization of immunoenzymatic assays useful for serodiagnosis of infectious diseases. Grading System: Passed (P), Not Passed (NP)

MICR 8525 – Genetics and Molecular Biology of Microorganisms. Four (4) credits.
This course is designed for second year graduate students from the Biomedical Sciences program. The course will cover the fundamentals of replication, regulation of gene expression and the evolution of genetic material in both, prokaryotic and eukaryotic organisms. Additionally, recombinant DNA and RNA techniques and current topics in the Molecular Biology of Microorganisms will be covered in this course.

MICR 8530 - Mycology. Two (2) credits.
The fundamental characteristics of fungi and the pathological, immunological, and diagnostic aspects of most important pathogenic fungi and the diseases they cause.

MICR 8531 - Mycology Laboratory. One (1) credit.
The basic techniques in the diagnosis of diseases caused by fungi.

MICR 8532 - Advanced Topics in Mycology. One (1) credit.
Topics of interest related to Medical and Environmental Mycology.

MICR 8533 - Advanced Topics in Mycology. Two (2) credits. Pre-requisite: MICR 8532.
Topics of interest related to Medical and Environmental Mycology.

MICR 8534 - Advanced Topics in Mycology. Three (3) credits. Pre-requisite: MICR 8532.
Topics of interest related to Medical and Environmental Mycology.

MICR 8540 - Principles of Immunology. Three (3) credits.
Basic concepts in Immunity, Hypersensitivity, both Cellular and Humoral, Tumor Immunology, Cancer Immunology, and Transplant Immunology. It also includes basic concepts in Immunochemistry.

MICR 8541 - Immunology Laboratory. One (1) credit.
Basic techniques on Immunology and Immunochemistry.

MICR 8542 - Advanced Topics in Immunology. Two to three (2-3) credits. Pre-requisite: MICR 8540.
Topics related to Immunology or Immunochemistry.

MICR 8543 - Advanced Topics in Immunology. Two (2) credits. Pre-requisite: MICR 8540.
Topics related to Immunology or Immunochemistry.

MICR 8544 - Advanced Topics in Immunology. Three (3) credits. Pre-requisite: MICR 8540.
Topics related to Immunology or Immunochemistry.

MICR 8545 - Advanced Immunology: Immune System Cell Trafficking. Two (2) credits. Pre-requisites: MICR 8540, MICR 8499.
Scientific research publications on relevant immune cell populations and the molecular factors involved in the process of cell migration and the traffic of immune cell throughout various tissues in homeostatic and inflammatory conditions, will be discussed in this course. Emphasis will be placed on historical publications as a tool of knowledge in order to lead the student through the evolution of particular subjects over the years. It will give the student the opportunity to explore the initial observations that led to experimental design, results and conclusions of different concepts. At the end of the course it is expected the student had acquired depth in knowledge on how immune cells migrate and what are the factors that regulate these processes; development of new routes of scientific critical analysis is also expected in the student.

MICR 8546 - Design, Development, and Implementation of Vaccines. Three (3) credits. Pre-requisites: MICR 8540, MICR 8499.
This course provides the student with basic and advanced knowledge about the diverse strategies to be considered to develop any vaccine against infectious agents. General aspects of vaccines against infectious agents, both those commercially available and those in developing status, will be studied, including the safety and adverse effects of them. The course will initiate with the reviewing of the history of vaccines. Then, emphasis will be placed on describing the vaccines of first, second and third generation; the scientific approaches to generate vaccines; as well as the discussion of their benefits and their risks. The course also comprises the study of necessary events to produce a vaccine at analytical levels and the different levels of validation until their commercially mass manufacturing. Methods to monitor vaccines effectiveness in public health and controversies related to the adverse effects of vaccines that several groups have raised will also be discussed.

MICR 8562 - Advanced Topics in the Genetics of Microorganisms. One (1) credit.
Topics of interest related to Microbial Genetics will be discussed.

MICR 8563 - Advanced Topics in the Genetics of Microorganisms. Two (2) credits.
Topics of interest related to Microbial Genetics will be discussed.

MICR 8564 - Advanced Topics in the Genetics of Microorganisms. Three (3) credits.
Topics of interest related to Microbial Genetics will be discussed.

MICR 8580 - Graduate Seminar. One to three (1-3) credits.
Includes attendance to all seminars presented by other members of the Department and the presentation of at least one one-hour seminar during the course of the semester.

MICR 8590 - Teaching Practice. One (1) credit. Pre-requisite: MICR 8499.
The student is expected to serve as an instructor in any laboratory session (at the undergraduate level) offered by the Department of Microbiology. The student will be under the direct supervision of one of the faculty members.

MICR 8595 - Master's Thesis. Six (6) credits.
The student will be involved in full-time research activities for at least one semester. The credit will be awarded upon the presentation and approval of his thesis.

MICR 8596 - Preparation of Thesis Proposal in Microbiology. One (1) credit. Pre-requisites: Approved all the required credits for the master or doctoral degree (except thesis) of the Microbiology Department, also approved the comprehensive exam of the Department.
This course is addressed to graduate students of microbiology and it will provide full-academic load to the student. The main objective of the course is to train students in writing thesis proposals and federal pre-doctoral fellowships following RO1-NIH format. Topics to be discussed include the development of specific aims of the proposal, critical evaluation of literature for hypothesis development, analysis of preliminary results, and design of research methodology to evaluate the problem to be investigated. The outcome of this course is the written document of a thesis proposal that should be approved by the thesis advisor and presented to the thesis committee as a requirement for the course approval.

MICR 8597 - Preparation for Comprehensive Exam of Microbiology. Three (3) credits. Pre-requisites: MICR 8499, MICR 8496, MICR 8540, MICR 8580, MICR 8590, BCHM 8511, BCHM 8512, CBIO 8500, four (4) elective courses.
The aim of this course is to lead the student in his/her self-preparation for the oral and written comprehensive exam. Through the discussion of recently published scientific literature this course will give the student the opportunity to reinforce developed critical thinking skills in order to integrate and refine acquired knowledge during graduate studies. Topics to be analyzed in the course include the evaluation of recent, as well as, previous scientific literature to the revision of hypothesis testing, and the understanding of new and complexes technologies, data analysis, and conclusions regarding the established hypothesis and applied methods. The course also provides a period of preparation through independent study in which the student reviews and consolidates basic and advanced concepts of the different areas of microbiology and related fields according to the area of interest selected by the student. This course will provide full-academic load to the student.

MICR 8599 - Doctoral Dissertation. Fifteen (15) credits.
The student will be involved in full-time research activities for at least a year. The credits will be awarded upon the presentation and approval of the thesis.

ZOME 6503 - Medical Parasitology. Three (3) credits.
Helminths and protozoa of medical importance. Special attention to sample handling and to the practice of some diagnostic techniques.

ZOME 8502 - Introduction to Parasitology. Three (3) credits.
Parasitism, with special emphasis on the situations of real impact on human and domestic animal's health. The Biology Transmission and Identification of Parasites are revised.

ZOME 8506 - Protozoa. Two (2) credits.
To familiarize the student with modern approaches to: a) The study of protozoan parasites of medical relevance, b) Worldwide important diseases caused by protozoan parasites. The student will become familiar with recent published literature relevant to the course and the critical analysis of published materials as well as interpretations of results.

ZOME 8513 - Laboratory Methods in Parasitology. One (1) credit.
The most refined laboratory methods and techniques specially those concerning each candidate's special problem.

ZOME 8514 - Laboratory Methods in Parasitology. Two (2) credits.
The most refined laboratory methods and techniques specially those concerning each candidate's problems.

ZOME 8515 - Laboratory Methods in Parasitology. Three (3) credits.
The most refined laboratory methods and techniques specially those concerning each candidate's special problems.

ZOME 8516 - Laboratory Methods in Parasitology. Four (4) credits.
The most refined laboratory methods techniques specially those concerning each candidate's special problems.

Department of Pharmacology and Toxicology

Master of Science with specialty in Pharmacology (MS)
Doctor of Philosophy with specialty in Pharmacology (PhD)

PHAR 8500 - Pharmacology. Five (5) credits.
This course includes lectures on the nature and application of the more important drugs and general principles of Pharmacology. Laboratory exercises, designed to illustrate some of the lectures, are performed.

PHAR 8503 - Muscles: Biophysics, Physiology, and Pharmacology. Three (3) credits.
This course is an introduction to Biophysics, Physiology, and Pharmacology of Muscle. It summarizes basic concepts on structure and energetics of muscle contraction. A general outlook on Physiology will also be included.

PHAR 8504 - Molecular Pharmacology and Biophysics of Excitable Tissue. Three (3) credits.
This course will consist of information lectures, discussions, seminars, and laboratories experiments related to the molecular mechanisms by which drugs change the electrical properties of excitable tissues. Considering the direct participation of the students on laboratory work, a limited numbers of applications will be accepted.

PHAR 8505 - Topics in Pharmacology. One (1) credit.
This course will provide for the discussion of special topics, covered by one or more members of the staff or visiting scientists. The topics to be covered must be approved by the Department's Graduate Faculty. This course can be taken more than once.

PHAR 8506 - Topics of Pharmacology. Two (2) credits.
This course will provide for the discussion of special topics, covered by one or more members of the staff or visiting scientists. The topics to be covered must be approved by the Departmental Graduate Faculty. This course can be taken more than once.

PHAR 8507 - Topics of Pharmacology. Three (3) credits.
This course will provide for the discussion of special topics, covered by one or more members of the staff or visiting scientists. The topics to be covered must be approved by the Departmental Graduate Faculty. This course can be taken more than once.

PHAR 8508 - Topics of Pharmacology. Four (4) credits.
This course will provide for the discussion of special topics, covered by one or more members of the staff or visiting scientists. The topic to be covered must be approved by the Departmental Graduate Faculty. This course can be taken more than once.

PHAR 8509 - Topics of Pharmacology. Five (5) credits.
This course will provide for the discussion of special topics, covered by one or more members of the staff or visiting scientists. The topics to be covered must be approved by the Departmental Graduate Faculty. This course can be taken more than once.

PHAR 8510 - Topics of Pharmacology. Six (6) credits.
This course will provide for the discussion of special topics, covered by one or more members of the staff or visiting scientists. The topic to be covered must be approved by the Departmental Graduate Faculty. This course can be taken more than once.

PHAR 8512 - Neuropharmacology. Three (3) credits.
The first half of this course will deal with the Biochemistry and Neuropharmacology of the Mammalian Central Nervous System. The second half will emphasize the special situations prevailing in developing and deferented neurons.

PHAR 8513 - Pharmacology Seminar. One (1) credit.
This course is designed so that, with the assistance of the faculty, graduate students will present and discuss papers from the scientific literature. It must be taken each semester by departmental studies. Grading System: Passed (P), Not Passed (NP)

PHAR 8514 - Heart Physiology and Pharmacology. Two (2) credits.
Lectures and demonstrations.

PHAR 8518 - Renal Pharmacology. Two (2) credits.
Renal transport processes as they apply to the handling of pharmacological agents will be described. An overview of method currently employed in the field of Renal Pharmacology will be provided. Particular attention will be given to the use of clearance and renal micropunture studies to determine the site of action along the nephron of various agents.

PHAR 8519 - Cellular Neurobiology: Integrative Approach. Three (3) credits.
This course provides a cellular approach to Neurobiology. It begins with a general description of the unique properties of neural cells and the advances toward an understanding several nervous system functions. In this course, integration of the Biochemistry, Anatomy, Physiology, and Pharmacology is emphasized.

PHAR 8525 - Pharmacological Methods. Three (3) credits.
The purpose of this course is to expose the students to the theoretical and practical aspects of methods being used in pharmacological research.

PHAR 8526 - General Principles in Pharmacology. Three (3) credits.
The course is intended to acquaint students with the understanding of the basic concepts of pharmacology and toxicology. Through lectures and group discussions main topics such as absorption, distribution, metabolism and elimination (ADME), pharmacodynamics (receptor theory and signaling), membrane transporters, and pharmacogenomics will be discussed.

PHAR 8527 - Modes of Action of Antibiotics. Two (2) credits. Pre-requisites: BCHM 8500.
The purpose of this course is to prepare the students to analyze and critically understand the more recent findings in the field of pharmacology of antibiotics. The mechanisms by which antibiotics work, at molecular level, is studied. Interactions of antibiotics with the various biochemical targets for drug action and the molecular basis of bacterial resistance to drugs are also analyzed.

PHAR 8535 - Laboratory Rotation in Pharmacology and Toxicology. Two (2) credits.
This course is designed to introduce the student to current research concepts and techniques used in the pharmacology and toxicology areas. Throughout rotations the student will visit three different laboratories to have the opportunity to explore possible research areas in order to define a thesis project of her/his interest, as well as to interact with the possible mentor and her/his research group. The course includes discussion of the research project and exposure to laboratory techniques.

PHAR 8595 - Master's Thesis. Six (6) credits.
This course is the required research for the Master of Science in Pharmacology Degree. It is taken with the approval of the thesis advisor.

PHAR 8598 - Proposal Preparation in Pharmacology. Three (3) credits. Pre-requisites: Approved required credits for the master or doctoral degree (except thesis) of the Department of Pharmacology and Toxicology, also approved comprehensive exam of the Department. Minimum grade of B in core courses.
This course offers essential information for the preparation of thesis proposals integrating basic concepts of Pharmacology, theories and research strategies. Topics to be discussed include the development of specific aims, evaluation of literature to develop a rationale for the proposal, analysis of preliminary results, and design of research methodology to evaluate the problems to be investigated. The central focus of the course will be to train students in writing of thesis proposals and federal predoctoral fellowships. In addition, potential pitfalls of the proposed research will be discussed. The material will be presented by the student as discussions of specific topics recently published in scientific journals and as review of literature related to the specific student proposal. Grading System: Passed (P), Not Passed (NP)

PHAR 8599 - Doctoral Dissertation. Fifteen (15) credits.
This course is the required research for the Doctor of Philosophy in Pharmacology Degree. It is taken only with the approval of the thesis advisor.

TOXI 8501 - Basic Toxicology. Three (3) credits.
Discussion of the origin action, mechanism of death, signs and symptoms, MLD, metabolism, prognosis of the common poisons from human tissues. Interpretation of these analytical results on a clinical and/or forensic basic.

TOXI 8515 - Special Topics. Two (2) credits.
Designation under which from year to year could be registered different courses offered by visiting professors. They will be announced with a detailed description of the course, credits assigned, and professor in charge.

INTERDISCIPLINARY COURSE DESCRIPTIONS
Undergraduate or Graduate Level Course Descriptions

INTD 5005 - Human Communications. Three (3) credits.
The course provides the students the opportunity to understand the normal development of communication in man. It identifies those factors that facilitate or hinder normal development of communication. Also, it will provide the opportunity to study the limitations due to physical, social and psychological variables and their management. This course is designed for graduate and post-bachelor level students.

INTD 5006 - Interdisciplinary Health Team Experience. Three (3) credits.
Field experiences with concurrent daily sessions for the development of the team, including analysis of the team concept, team characteristics, group dynamics, communication patterns, others. The conceptual framework of this course evolves around the development of a special project which can be of a clinical, community or organizational nature. Instructional methodology will include group exercises for teamwork skill development, group discussions and development, group discussions and development of a special project.

INTD 5065 - Data Analysis in Cancer Research. Two (2) credits. Pre-requisites: Calculus I or equivalent, basic course in Statistics or Biostatistics.
Through lectures, group discussions and other active learning strategies, this course will introduce the students to statistical and computing methods for observational studies and clinical trials. The students will acquire knowledge in basic concepts of Data Analysis, utilizing Biostatistics and Bioinformatics tools, and applying these to biomedical/translational cancer and population sciences research.

INTD 5116 - Incorporation of Technology in the Designing of Educational Activities. Three (3) credits.
This is a multidisciplinary course created for undergraduate and graduate students. The course exposes students to the basic concepts of teaching-learning and develops skills in the use of technology for the development of educational activities relevant to the discipline of the student. The course will discuss topics as: planning and implantation of educational activities and the use of computerized programs of word processing and design of presentations, for the creation of articles and poster boards as educational materials.

INTD 5125 - Enhancing Verbal, Analytical Reading and Writing Skills for Cancer Research. Two (2) credits.
Through lectures, group discussions and other active learning strategies, the students will strengthen the essential skills to understand scientific literature related to the topic of cancer and to write scientific essays. Special emphasis will be given to the development of skills, such as: verbal comprehension and discerning if research data and results are reliable. The course will also deal with scientific topics and research editing and writing skills.

INTD 5135 - Responsible Conduct for Research with Emphasis in Cancer Projects. Two (2) credits.
Through face to face discussions between the faculty offering the lectures and among the participating trainees, and through other active learning strategies this course will provide research ethics fundamental knowledge, skills, reflection experiences and challenges necessary for students and cancer research trainees to conduct research in an ethical manner with animal and human subjects, as well as with collaborating colleagues and members of the scientific and academic communities. Topics to be addressed are: fundamental principles; the ethics of research; conflict of interest; policies regarding human subjects, live vertebrate animal subjects in research, and safe laboratory practices; mentor/mentee responsibilities and relationships; collaborative research; peer review, data acquisition and laboratory tools; research misconduct, policies for handling misconduct and responsible management and sharing of authorship of research work and publications.

INTD 5145 - Research Methodology and Design Focused on Cancer. Two(2) credits.
Through interactive lectures, group discussions, other active learning strategies, this course will provide foundational knowledge in research methodology and design, as well as analysis and interpretation of research data in the areas of biomedical, clinical, translational and population sciences, focused in cancer. In addition, other components of a research study and of a research protocol will be studied. Methodology discussions will address the definition of research questions, hypothesis and objectives, as well as study procedures, materials, instruments, and electronic data bases used in re-search. At the end of the course, the student will design a cancer research protocol and will also present research data, either orally or in a poster.

INTD 5996 - Clinical Observation Experiences (Shadowing) for Non-Medicine Students. Zero (0) credits.
This course is intended for the enrollment of students considering a career in medicine. Students are exposed to a variety of activities in different clinical scenarios in a shadowing experience, limited specifically on watching the physician as he/she performs his or her daily duties. It serves the purpose of exposing students to the diverse health care settings with the intent of facilitating their decision making about the profession they really are interested for his/her life. Students will not be allowed to engage in any activity that is considered the practice of medicine such as, but not limited to: medical diagnosis, ordering or administering medications, carrying out invasive or non-invasive procedures (i.e.: suturing, wound cleaning, vaccine administration, etc.), patient counseling or education, or any type of communication traditionally attributed to the patient-physician relationship. Grading system: Passed (P). Not Passed (NP)

INTD 5997 - Advanced Topics in Cancer. One to three (1-3) credits.
Through lectures, interactive lectures, group discussions and other active learning strategies, students will learn about the latest advances in prevention, research and innovative treatment for cancer. The discussion of topics will provide the student with intellectually challenging opportunities to integrate new knowledge with information acquired through other experiences in the field of cancer research. The course will be offered by guest speakers, visiting professors from other academic institutions and faculty from the UPR Medical Sciences Campus.

Graduate Level Course Descriptions

INTD 6025 - Interdisciplinary Health Team Practice. Three (3) credits.
Students from different health disciplines will be introduced to the basic concepts of interdisciplinary team practice in the delivery of health care services. Future health professionals will be provided with the basic skills required to work effectively in interdisciplinary health teams. They will collaborate in group exercises and activities designed to develop a greater understanding of the roles of different professions in an interdisciplinary health team. Students will be able to recognize and define their professional perspective and expertise, as well as, identify the expertise and competence of other health professionals. The course will combine classroom lectures, group discussions, and exercises with practice in a health care center. At the health care center, students will consult with health care providers working in interdisciplinary teams. They will also participate in case conferences, and will develop health care plans.

INTD 7005 - Interdisciplinary Health Team Practice. Eighty to one hundred and sixty (80-160) Hours.
Students from different health disciplines will be introduced to the basic concepts of interdisciplinary team practice in the delivery of health care services. Future health professionals will be provided with the basic skills required to work effectively in interdisciplinary health teams. They will collaborate in group exercises and activities designed to develop a greater understanding of the roles of different professions in an interdisciplinary health team. Students will be able to recognize and define their professional perspective and expertise, as well as, identify the expertise and competence of other health professionals. The course will combine classroom lectures, group discussions, and exercises with practice in a health care center. At the health care center, students will consult with health care providers working in interdisciplinary teams. They will also participate in case conferences, and will develop health care plans. Grading System: Passed (P), Not Passed (NP)

INTD 7115 - Origins of Experimental Medicine: Harvey's De Motu Cordis. Fifty four to sixty six (54-66) hours. Pre-requisites: MPRI 7140.
This course fosters in students the integration of medicine with humanities through the study of the analytical and experimental research project of William Harvey as compiled in his text Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus. The course begins with an analysis of his predecessors' work that gave rise to the epistemological tools Harvey employed. The student will execute a careful and integrated examination of the actual experiments, physiologic studies and the employment of the quantitative methods Harvey employed to discover blood circulation. They shall also examine how his findings presaged the conceptual scaffolding for the modern understanding of biological systems. Through an exhaustive analysis of Harvey's work, as well as that of his predecessors and his contemporaries' critique, the student shall have the opportunity to essay critical thinking and from this vantage point the creation, development and transformation of scientific medicine.

INTD 7125 - Enhancing Verbal, Analytical Reading and Writing Skills for Cancer Research. Two (2) credits.
Through lectures, group discussions and other active learning strategies, the students will strengthen the essential skills to understand scientific literature related to the topic of cancer and to write scientific essays. Special emphasis will be given to the development of skills, such as: verbal comprehension and discerning if

research data and results are reliable. The course will also deal with scientific topics and research editing and writing skills.

INTD 7995 - Complementary Practices for Health and Healing. Three to five (3-5) credits.
The course gives an overview of various health belief systems in Complementary and Alternative Medicine (CAM) and examines the current trends in the utilization of some of these practices and its implications. Specific therapeutic practices will be discussed. Information resources of natural products will also be reviewed. The paradigms in which biomedical model is based, its strengths and limitations will be discussed, as well as comparison with other healing philosophies and practices. Most common forms of healing practices, its theories, proposed mechanism of action, specific indication, expected results, available scientific evidence, contraindications, adverse effects, and interactions or interference between conventional and non-conventional practices will be study. This course will be offered at the undergraduate, graduate, and first professional level. For medical school students the number of hours will fluctuate between 80-160 hours. The instructional strategies will include lecture, discussion, practical experience, case study, and workshop.

INTD 7996 - Seminar on the History of Tropical Medicine in Puerto Rico. Fifty four to seventy two (54-72) hours.
This seminar will employ the representations of epidemics present in seminal historiographic narratives pertaining to the "colonial medicine" of the XIXth century (the smallpox paradigm) and the latter's transformation into the "neo-imperial tropical medicine" of the first half of the XXth century (the hookworm paradigm) to historicize about the period in question. The aim is not to display a linear chronological narrative of Puerto Rico's medical history but to enable historical thinking from history-in-itself as well as to incentivize an interest on historical studies. Methodologically it will focus on developing and uncovering new approaches to the history of medicine stemming from the act of historicizing per se. This approach entails group-investigation of seminal historiographical representations, historical documents or selected micro-subjects (e.g., history of specific diseases, micro-biographies, concept history, discourse analysis) from the standpoint of their historization.

INTD 8065 - Data Analysis in Cancer Research. Two (2) credits. Pre-requisites: Calculus I or equivalent, basic course in statistics or biostatistics.
Through lectures, group discussions and other learning strategies , this course will introduce the students to statistical and computing methods for observational studies and clinical trials. The students will acquire knowledge in basic concepts of Data Analysis, utilizing Biostatistics and Bioinformatics tools, and applying these to biomedical/translational cancer and population sciences research.

INTD 8125 - Enhancing Verbal, Analytical Reading and Writing Skills for Cancer Research. Two (2) credits.
Through lectures, group discussions and other active learning strategies, the students will strengthen the essential skills to understand scientific literature related to the topic of cancer and to write scientific essays. Special emphasis will be given to the development of skills, such as: verbal comprehension and discerning if research data and results are reliable. The course will also deal with scientific topics and research editing and writing skills.

INTD 8135 - Responsible Conduct for Research with Emphasis in Cancer Projects. Two (2) credits.
Through face to face discussions between the faculty offering the lectures and among the participating trainees, and through other active learning strategies this course will provide research ethics fundamental knowledge, skills, reflection experiences and challenges necessary for the students and cancer research trainees to conduct research in an ethical manner with animal and human subjects, as well as with collaborating colleagues and members of the scientific and academic communities. Topics to be addressed are: bioethical fundamental principles; the ethics of research; conflict of interest; policies regarding human subjects, live vertebrate animal subjects in research, and safe laboratory practices; mentor/mentee

responsibilities and relationships; collaborative research; peer review, data acquisition and laboratory tools; research misconduct, policies for handling misconduct and responsible management and sharing of authorship of research work and publications.

INTD 8145 - Research Methodology and Design Focused on Cancer. Two (2) credits.
Through interactive lectures, group discussions, other active learning strategies, this course will provide foundational knowledge in research methodology and design, as well as analysis and interpretation of research data in the areas of biomedical, clinical, translational and population sciences, focused in cancer. In addition, other components of a research study and of a research protocol will be studied. Methodology discussions will address the definition of research questions, hypothesis and objectives, as well as study procedures, materials, instruments, and electronic data bases used in research. At the end of the course, the student will design a cancer research protocol and will also present research data, either orally or in a poster.

INTD 8996 - Advanced Topics in Cancer. One to three (1-3) credits.
Through lectures, interactive lectures, group discussions and other active learning strategies, the students will learn about the latest advances in prevention, research and innovative treatment for cancer. The discussion of topics will provide the student with intellectually challenging opportunities to integrate new knowledge with information acquired through other experiences in the field of cancer research. The course will be offered by guest speakers, visiting professors from other academic institutions and faculty from the UPR Medical Sciences Campus.

Faculty

ABDUL HADI-MARTÍNEZ, ANWAR – Assistant Professor; MD, 2010, University of Puerto Rico - Medical Sciences Campus.

ABELLEIRA, MAYRA – Assistant Professor; MD, 2017, University of Puerto Rico - Medical Sciences Campus.

ACEVEDO NIEVES JUAN A. - *Adjunct Professor*; PhD, 2002, Graduate Theological Foundation, Indiana.

ACEVEDO-MONTALVO, NOELIA - *Adjunct Professor*; Pharm D, 2009, Nova Southeastern University, Florida.

ACEVEDO-RIVERA, EDGAR N.- *Assistant Professor;* MD, 2006, University of Puerto Rico - Medical Sciences Campus.

ACEVEDO-SALAS, YARITZA – Adjunct Professor; MS, 2010, Universidad del Turabo – Puerto Rico.

ACOSTA-MIRANDA, ALEX M. - *Assistant Professor;* MD, 2007, University of Puerto Rico - Medical Sciences Campus.

AGOSTO-MOJICA, ANARDI - *Assistant Professor*; MD, 2001, Ponce School of Medicine and Health Sciences - Puerto Rico.

AGUDO-ORTIZ, MARÍA J. – *Assistant Professor*; MD, 1995, Universidad de Navarra, Spain.

ALDRICH-NOVOA, JORGE A. - *Assistant Professor; MD,* 1999, University of Puerto Rico - Medical Sciences Campus.

ALEJANDRO-SERRANO, KARLA C. – Assistant Professor; MD, 2004, Universidad Central del Caribe-Puerto Rico.

ALFONSO-MÉNDEZ, GISHLAINE - *Professor;* MD, 1986, University of Puerto Rico - Medical Sciences Campus.

ALGAZE-BEATO, ANTONIO - *Associate Professor;* PhD, 2002, University of Ohio.

ALMODÓVAR-ALMODÓVAR, ÁNGEL - *Assistant Professor*; MD, 1970, University of Puerto Rico - Medical Sciences Campus.

ALMODÓVAR-MERCADO, GUSTAVO J. – Assistant Professor; MD, 2009, University of Puerto Rico - Medical Sciences Campus.

ALTIERI-NIETO, PABLO I. - *Professor;* MD, 1967, University of Puerto Rico - Medical Sciences Campus.

ALVARADO-SANTIAGO, MILLIETTE – *Assistant Professor*; MD, 2010, University of Puerto Rico - Medical Sciences Campus.

ÁLVAREZ-ALLENDE, CARLOS R. – Assistant Professor; MD, 2008, University of Puerto Rico - Medical Sciences Campus.

ÁLVAREZ-MONTES, MARÍA M. - *Assistant Professor;* MD, 1990, University of Puerto Rico - Medical Sciences Campus.

AMADOR-LÓPEZ, JUAN F. – Assistant Professor; MD, 2004, University of Puerto Rico - Medical Sciences Campus.

AMY-TORRES, EDUARDO E. - *Associate Professor*; DMD, 1972, University of Puerto Rico - Medical Sciences Campus.

ANDINO-COLÓN, CÉSAR I. – *Assistant Professor*; MD, 2010, University of Puerto Rico – Medical Sciences Campus.

ANDUJAR RIVERA, KRYSTAHL, – *Assistant Professor;* MD, 2013, Universidad Central del Caribe- Puerto Rico.

ANTONGIORGI-TORRES, JOALEX – Assistant Professor; MD, 2012, University of Puerto Rico - Medical Sciences Campus.

ANTÚNEZ-GONZÁLEZ, IVÁN D. - *Assistant Professor;* MD, 1997, Universidad Central del Caribe - Puerto Rico.

AQUINO-BENÍQUEZ, ROCHELLE - *Psychologist II*; PsyD, 2006, Carlos Albizu University - Puerto Rico.

AQUINO-PIÑERO, EDNA E. - *Professor;* PhD, 2000, University of Puerto Rico - Medical Sciences Campus.

ARIAS-BERRIOS, RAFAEL- *Assistant Professor;* MD, 2013, University of Puerto Rico - Medical Sciences Campus.

ARIAS-MORALES, JOSÉ J. - *Assistant Professor*; MD, 2007, University of Puerto Rico - Medical Sciences Campus.

ARRAUT-GONZÁLEZ, JUAN C. - *Assistant Professor*; MD, 2006, Universidad Autónoma de Guadalajara - México.

ARROYO CARRERO, MARIE - *Assistant Professor*; MD, 2008, University of Puerto Rico - Medical Sciences Campus.

AYALA-CRUZ, ERNESTO J. - *Assistant Professor*; MD, 2004, University of Puerto Rico - Medical Sciences Campus.

AYALA-PEÑA, SYLVETTE - *Professor*; PhD, 1998, University of Texas Medical Branch.

BAERGA-ORTIZ, ABEL - *Professor*; PhD, 2001, University of California.

BAERGA-VARELA, LUIS - *Assistant Professor*; MD, 1999, Mayo Medical School – Minnesota.

BÁEZ-BERMEJO, ADRIANA - *Professor;* PhD, 1977, Universidad Autónoma de Madrid - Spain.

BÁEZ-CÓRDOVA, JOSÉ - *Assistant Professor;* MD, 1995, University of Puerto Rico - Medical Sciences Campus.

BALLESTER VARGAS, VEROUSHKA - *Assistant Professor*; MD, 2007, University of Puerto Rico - Medical Sciences Campus.

BALLESTER-ORTIZ, GORY - *Assistant Professor*; MD, 2005, University of Puerto Rico - Medical Sciences Campus.

BANCHS-PIERETTI, HÉCTOR L. - *Associate Professor;* MD, 1977, Universidad Nacional Pedro Henríquez Ureña - Dominican Republic.

BANCHS-VIÑAS, HÉCTOR L. - *Assistant Professor*; MD, 2010, University of Puerto Rico - Medical Sciences Campus.

BANERJEE, DIPAK K. - *Professor;* PhD, 1976, University of Calcutta - India.

BARRETO-ESTRADA, JENNIFER L. - *Professor*; PhD, 2001, University of Puerto Rico - Río Piedras Campus.

BARRIOS-VÁZQUEZ, NILKA J.- *Professor;* MD, 1981, Universidad Central del Caribe - Puerto Rico.

BEAUCHAMP-BÁEZ, BELINDA - *Professor;* MD, 1986, University of Puerto Rico - Medical Sciences Campus.

BEHRA-FISCHMEISTER, MARTINE L. – *Associate Professor*; PhD, 2002, Louis Pasteur University - Strasbourg, France.

BERMÚDEZ-RAMÍREZ, OLGA W. - *Assistant Professor*; MD, 1995, University of Puerto Rico - Medical Sciences Campus.

BERRÍOS-PÉREZ, RAMÓN R. – Assistant Professor; MD, 1988, University of Puerto Rico - Medical Sciences Campus.

BERRÍOS-SIERRA, KARLA A. – *Assistant Professor; MD, 2008, San Juan Bautista School of Medicine – Puerto Rico.*

BERTRÁN-PASARELL, JORGE - *Associate Professor;* MD, 1997, Ponce School of Medicine and Health Sciences - Puerto Rico.

BIBILONI-RODRÍGUEZ, JUAN J. - *Professor*; MD, 1983, University of Puerto Rico - Medical Sciences Campus.

BIDOT-SAN ANTONIO, MARÍA E. - *Associate Professor;* MPH, 1994, University of Puerto Rico – Medical Sciences Campus.

BILLOCH DE JOGLAR, OLGA - *Associate Professor;* MD, 1973, University of Puerto Rico - Medical Sciences Campus.

BLANCO-JANEIRO, ROSA E. - *Professor;* PhD, 1987, Cambridge University - United Kingdom.

BLAS-BORIA, DAVID E. - *Assistant Professor;* MD, 2006, University of Puerto Rico - Medical Sciences Campus.

BLASINI-TORRES, MARINO - *Professor*; MD, 1984, University of Puerto Rico - Medical Sciences Campus.

BOLAÑOS-ROSERÓ, BENJAMÍN - *Associate Professor*; PhD, 1983, Duke University - North Carolina.

BONILLA-FÉLIX, MELVIN A. - *Professor;* MD, 1986, University of Puerto Rico - Medical Sciences Campus.

BONILLA-MERCADO, INGRID M. – *Assistant Professor Ad-Honorem;* PhD, 2014, Ohio State University.

BOUET-RIVERA, KARY M. - *Assistant Professor;* MD, 2006, University of Puerto Rico - Medical Sciences Campus.

BRACERO-SERRANO, NABAL J. - *Assistant Professor*; MD, 1995, University of Puerto Rico - Medical Sciences Campus.

BRAU-JAVIER, CRISTINA - *Assistant Professor*; MD, 2008, Columbia University.

BRAU-RAMÍREZ, RICARDO H. - *Professor;* MD, 1975, University of Puerto Rico - Medical Sciences Campus.

BRAVO RIVERA, CHRISTIAN E. - *Assistant Professor*; MD, 2016, University of Puerto Rico - Medical Sciences Campus.

BRAVO-RIVERA, CHRISTIAN E. – *Joint Appointment with Dept. of Psychiatry*; PhD, 2016, University of Puerto Rico – Medical Sciences Campus.

BRYAN-DÍAZ, JAMES M. - *Assistant Professor*; MD, 2010, San Juan Bautista School of Medicine - Puerto Rico.

BURGOS-CALDERÓN, RAFAEL – *Professor*; MD, 1965, University of Puerto Rico - Medical Sciences Campus.

BURGOS-COTTO, JAVIER R. - *Assistant Professor;* MD, 1998, University of Puerto Rico - Medical Sciences Campus.

BURKE-RAMÍREZ, PETRA - *Professor;* MD, 1970, University of Puerto Rico - Medical Sciences Campus.

BUSQUETS-FERRIOL, JOSÉ M. – *Associate Professor*; MD, 1999, University of Puerto Rico - Medical Sciences Campus.

CABANILLAS-ESCALONA, FERNANDO - *Professor;* MD, 1970, University of Puerto Rico - Medical Sciences Campus.

CABEZAS-MIJUSTE, MARITZA - *Assistant Professor;* MD, 1983, Universidad Autónoma de Santo Domingo - Dominican Republic.

CABRERA-BEAUCHAMP, CARMEN M. - *Professor*; MD, 1982, University of Puerto Rico - Medical Sciences Campus.

CABRET-RAMOS, ROLDÁN - *Assistant Professor;* MD, 1982, University of Puerto Rico - Medical Sciences Campus.

CADILLA-VÁZQUEZ, CARMEN L. - *Professor*; PhD, 1986, University of Tennessee, Knoxville - Tennessee.

CALDERÓN-COLLAZO, THEA - *Assistant Professor;* MD, 1998, Universidad Autónoma de Guadalajara - México.

CALDERÓN-HERNÁNDEZ, EDITH M. - *Associate Professor;* MD, 1988, University of Puerto Rico - Medical Sciences Campus.

CALDERÓN-RODRÍGUEZ, RAFAEL E. - *Associate Professor;* MD, 1979, Universidad Autónoma de Santo Domingo - Dominican Republic.

CAMPBELL-BURKE, JOSEPH P. - *Assistant Professor*; MD, 1994, University of Colorado.

CAMUÑAS-CÓRDOBA, JOSÉ F. - *Associate Professor*; MD, 1987, University of Puerto Rico - Medical Sciences Campus.

CANARIO-BREA, QUIRICO - *Assistant Professor*; MD, 1977, Universidad Nacional Pedro Henríquez Ureña - Dominican Republic.

CARABALLO CARTAGENA, SONIA. - *Assistant Professor;* MD, 2015, University of Puerto Rico - Medical Sciences Campus.

CARABALLO CORREA, GLORIMAR - *Adjunct Professor;* PhD, 2020, University of Puerto Rico – Río Piedras.

CARLO-CHÉVERE, VÍCTOR L. - *Assistant Professor;* MD, 1997, Ponce School of Medicine and Health Sciences - Puerto Rico.

CARLO-FONT, JORGE - *Assistant Professor*; MD, 1977, Universidad Autónoma de Guadalajara - México.

CARLO-IZQUIERDO, JOSÉ R.- *Professor;* MD, 1978, University of Puerto Rico - Medical Sciences Campus.

CARMONA-QUIÑONES, YANIRA - *Psychologist II*; MA, 1997, Centro Caribeño Estudios Postgraduados - San Juan, Puerto Rico.

CARRERO-NIEVES, EVELYN - *Professor*; MD, 1982, University of Puerto Rico - Medical Sciences Campus.

CARRILLO-CARAMBOT, RAFAEL J. - *Assistant Professor*; MD, 1966, University of Puerto Rico - Medical Sciences Campus.

CARRIÓN-VARGAS, ENRIQUE – *Associate Professor;* MD, 1993, University of Puerto Rico - Medical Sciences Campus.

CARRO-FIGUEROA, ERIC - *Assistant Professor*; MD, 1974, University of Puerto Rico - Medical Sciences Campus.

CASILLAS-MURPHY, GUIOVANNI - *Assistant Professor*; MD, 2001, University of Puerto Rico - Medical Sciences Campus.

CASTELLVÍ-ARMAS, MARÍA V. - *Assistant Professor*; MD, 1986, Ponce School of Medicine and Health Sciences - Puerto Rico.

CASTILLO-BEAUCHAMP, YAMIL E. - *Assistant Professor*; MD, 2006, University of Puerto Rico - Medical Sciences Campus.

CASTILLO-VÉLEZ, MARUQUEL - *Assistant Professor;* MD, 1996, University of Puerto Rico - Medical Sciences Campus.

CASTRO-MONTALVO, JUSTINIANO - *Assistant Professor;* MD, 1987, University of Puerto Rico - Medical Sciences Campus.

CHALOKA-GONZÁLEZ, RAYMOND – *Assistant Professor*; MD, 1991, University of Puerto Rico - Medical Sciences Campus.

CHAPEL CRESPO, CRISTEL- *Assistant Professor*; MD, 2011, University of Puerto Rico - Medical Sciences Campus.

CHINEA-AMAEO, EDUARDO – *Assistant Professor*; MD, 2006, University of Puerto Rico - Medical Sciences Campus.

CHORNA, NATALIYA – *Adjunct Professor*; PhD, 1987, Ukrainian Academy of Sciences, Ukraine.

CLAUDIO-FIGUEROA, NORMA A. - *Associate Professor;* MD, 1997, Ponce School of Medicine and Health Sciences - Puerto Rico.

CLAUDIO-SANTIAGO, PEDRO J. - *Assistant Professor;* MD, 2000, University of Puerto Rico - Medical Sciences Campus.

CLIMENT-PERIS, CONSUELO - *Professor*; MD, 1974, Universidad de Zaragoza – Spain.

COLLAZO-GUTIÉRREZ, NAOMI – *Assistant Professor*; MD, 2013, Universidad Autónoma de Guadalajara, México.

COLÓN-CASANOVAS, NORMAN E. – *Assistant Professor*; MD, 2009, University of Puerto Rico - Medical Sciences Campus.

COLÓN-DÁVILA AMANDA M. – *Social Worker I*; MSW, 2008, University of Puerto Rico – Río Piedras Campus.

COLÓN-FONTÁNEZ, FRANCISCO - *Associate Professor*; MD, 1992, University of Puerto Rico - Medical Sciences Campus.

COLÓN-GARCÍA DE LA NOCEDA, MANUEL - *Assistant Professor*; MD, 2000, University of Puerto Rico - Medical Sciences Campus.

COLÓN-GONZÁLEZ, GLORIA E. - *Associate Professor;* MD, 1985, University of Puerto Rico - Medical Sciences Campus.

COLÓN-MÁRQUEZ, JOSÉ A. - *Assistant Professor;* MD, 2003, Universidad Central del Caribe - Puerto Rico.

COLÓN-NEGRÓN, EDGAR - *Professor*; MD, 1984, University of Puerto Rico - Medical Sciences Campus.

COLÓN-RAMOS, MARIELIS - *Adjunct Professor;* BA, 2005, University of Puerto Rico - Río Piedras Campus.

COLÓN-RODRÍGUEZ, ELFRÉN - *Associate Professor*; MD, 2004, University of Puerto Rico - Medical Sciences Campus.

COLÓN-SEMIDEY, ÁNGEL J. - *Assistant Professor*; MD, 1993, Universidad Central del Caribe - Puerto Rico.

CONDE-SANTIAGO, JOSÉ G. - *Professor*; MD, 1980, University of Puerto Rico - Medical Sciences Campus.

CÓRDOVA-GONZÁLEZ, MARÍA – Assistant Professor; MD, 2010, University of Puerto Rico - Medical Sciences Campus.

COREY-BEST, SUSAN C. - *Professor*; PhD, 1971, State University of New York.

CORREA-CARRO, JOSÉ J. - *Assistant Professor*; MD, 1985, University of Puerto Rico - Medical Sciences Campus.

CORREA-RIVAS, MARÍA S. - *Professor*; MD, 1988, University of Puerto Rico - Medical Sciences Campus.

CORTÉS-VELÁZQUEZ, ARNOLD D. - *Assistant Professor*; MD, 1995, University of Puerto Rico - Medical Sciences Campus.

COSTAS-CÁCERES, PABLO J. - *Associate Professor;* MD, 1992, University of Puerto Rico - Medical Sciences Campus.

COTTO-IBARRA, LUIS - *Professor*; MD, 1977, University of Puerto Rico - Medical Sciences Campus.

CRESPO-BELLIDO, MARÍA J. - *Professor*; PhD, 1993, University of Puerto Rico - Medical Sciences Campus.

CRESPO-HERNÁNDEZ, MYRIAM – *Associate Professor*; MD, 1996, Universidad Central del Caribe - Puerto Rico.

CRESPO-SALGADO, JANICE – *Assistant Professor*; MD, 2008, San Juan Bautista School of Medicine – Puerto Rico.

CRUZADO-RAMOS, ARMANDO J. – Assistant Professor; MD, 2002, University of Puerto Rico - Medical Sciences Campus.

CRUZ-BURGOS, ROSA I. - *Professor*; MD, 1980, University of Puerto Rico - Medical Sciences Campus.

CRUZ-CONCEPCIÓN, ALEXANDRA – *Psychologist I*; MA, 2003, Inter American University of Puerto Rico.

CRUZ-CORREA, MARCIA R. - *Professor;* MD, 1995, University of Puerto Rico - Medical Sciences Campus; PhD, 2003, John Hopkins University.

CRUZ-CUEVAS, ELSIE I. - *Professor;* MD, 1995, University of Puerto Rico - Medical Sciences Campus.

CRUZ-DÍAZ, JOSÉ R. - *Assistant Professor*; MD, 1993, University of Puerto Rico - Medical Sciences Campus.

CRUZ-MENDIETA, NORMA - *Professor*; MD, 1976, University of Puerto Rico - Medical Sciences Campus.

CRUZ-SANTANA, ALMA M. - *Assistant Professor*; MD, 1984, University of Puerto Rico - Medical Sciences Campus.

CRUZ-TORRES, CATHERINE - *Psychologist II*; MA, 1980, Centro Caribeño de Estudios Postgraduados - San Juan, Puerto Rico.

CRUZ-VILLEGAS, VANESA - *Assistant Professor*; MD, 1996, University of Puerto Rico - Medical Sciences Campus.

CUMBA-BERMÚDEZ, RICARDO J. – Assistant Professor; MD, 2009, Ponce School of Medicine and Health Science – Puerto Rico.

DÁVILA-PARRILLA, ARIEL D. – Assistant Professor; MD, 2011, University of Puerto Rico - Medical Sciences Campus.

DÁVILA-TORRES, JOSÉ R. - *Assistant Professor;* MD, 1998, University of Puerto Rico - Medical Sciences Campus.

DE JESÚS-BERRÍOS, YOHANA - *Professor;* MD, 1981, University of Puerto Rico - Medical Sciences Campus.

DE JESÚS-GARCÉS, ORLANDO - *Professor;* MD, 1987, University of Puerto Rico - Medical Sciences Campus.

DE JESÚS-GONZÁLEZ, NILKA - *Associate Professor*; MD, 2006, University of Puerto Rico - Medical Sciences Campus.

DE JESUS-ROJAS, WILFREDO – *Assistant Professor*; MD, 2008, University of Puerto Rico - Medical Sciences Campus.

DE LA ROSA-JIMÉNEZ, NORMAN - *Assistant Professor*; MD, 2010, Universidad Central del Caribe - Puerto Rico.

DE LA VEGA-PUJOLS, ALBERTO B. - *Associate Professor;* MD, 1984, University of Puerto Rico - Medical Sciences Campus.

DE POOL-FIGUEROA, MAGDA E. - *Assistant Professor*; MD, 1995, University of Puerto Rico - Medical Sciences Campus.

DE SANTIAGO-PAGÁN, JOAKYNA - *Adjunct Professor;* MD, 2011, San Juan Bautista School of Medicine - Puerto Rico.

DE SOTO-CORDERO, NYDIA – Assistant Professor; MD, 2012, University of Puerto Rico - Medical Sciences Campus.

DE VARONA-NEGRÓN, MIGUEL A. - *Assistant Professor;* MD, 2005, University of Puerto Rico - Medical Sciences Campus.

DEL RÍO-MARTIN, JUAN V. - *Assistant Professor*, MD, 1987, Universidad Autónoma de Madrid - Spain.

DEL VALLE-SEGARRA, ANTONIO I. - *Professor;* MD, 1992, University of Puerto Rico - Medical Sciences Campus.

DELGADO-CIFUENTES, AURA F. – Assistant Professor; MD, 2008, Universidad Central del Caribe – Puerto Rico.

DELGADO-OSORIO, HÉCTOR - *Professor;* MD, 1963, University of Puerto Rico - Medical Sciences Campus.

DELIZ-ROLDÁN, BRENDA L. - *Associate Professor;* MD, 2000, University of Puerto Rico - Medical Sciences Campus.

DHARMAWARDHANE-FLANAGAN, SURANGANI - *Professor*; PhD, 1987, University of Massachusetts - Amherst.

DIAZ DIAZ, MAYELA - *Assistant Professor*; MD, 2012, University of Puerto Rico - Medical Sciences Campus.

DIAZ FIGUEROA, ASHLEY- *Assistant Professor*; MD, 2017, Universidad San Juan Bautista- Medical Sciences Campus.

DÍAZ-PÉREZ, CLEMENTE - *Professor;* MD, 1973, University of Puerto Rico - Medical Sciences Campus.

DÍAZ-RAMÍREZ, DIANA - *Assistant Professor*; MD, 1993, University of Puerto Rico - Medical Sciences Campus.

DÍAZ-SOTOMAYOR, FRANCISCO - *Assistant Professor;* MD, 1996, University of Puerto Rico - Medical Sciences Campus.

DIMOPOULOS-GEORGE - *Adjunct Professor;* PhD, 1996, University of Crete - Greece.

DOMÍNGUEZ-AYALA, DIMARIS - *Associate Professor*; MD, 1998, University of Puerto Rico - Medical Sciences Campus.

DONATE-PÉREZ, DORA DE L. - *Assistant Professor;* MD, 1989, Universidad Nacional Pedro Henríquez Ureña - Dominican Republic.

DORTA ESTREMERA, STEPHANIE - *Assistant Professor*; PhD, 2016, University of Texas Health Sciences Center-MD Anderson Cancer Center.

ECHEVARRÍA-ESCUDERO, MARÍA E. - *Associate Professor;* MD, 1998, Ponce School of Medicine and Health Sciences - Puerto Rico.

EMMANUELLI-ANZALLOTA, ANDRÉS - *Assistant Professor*; MD, 2006, University of Puerto Rico - Medical Sciences Campus.

ESCOBALES-ALICEA, NELSON - *Professor*; PhD, 1982, University of Puerto Rico - Medical Sciences Campus.

ESCOBAR-MEDINA, ENRIQUE - *Assistant Professor*; MD, 1992, University of Puerto Rico - Medical Sciences Campus.

ESPINO-HERNÁNDEZ, ANA M. - *Professor*; PhD, 1997, Instituto de Medicina Tropical Pedro Kouri - Cuba.

ESQUILÍN-RIVERA, INÉS O. - *Professor;* MD, 1989, University of Puerto Rico - Medical Sciences Campus.

ESTRONZA OJEDA, SAMUEL - *Assistant Professor*; MD, 2010, University of Puerto Rico - Medical Sciences Campus.

FACUNDO-ROSADO, AMÉRICA - *Professor;* PhD, 1992, University of Massachusetts Amherst.

FALCÓN-CHÉVERE, JORGE L. - *Assistant Professor*; MD, 2000, Ponce School of Medicine and Health Sciences - Puerto Rico.

FARGAS-BERRÍOS, NEICHMA S. - Assistant Professor; MD, 2006, Universidad Autónoma de Guadalajara - México.

FEBLES-NEGRÓN, ARELIS - *Assistant Professor;* MD, 2006, University of Puerto Rico - Medical Sciences Campus.

FEBO-RODRÍGUEZ, IRMA L. - *Professor;* MD, 1986, University of Puerto Rico - Medical Sciences Campus.

FELICIANO-EMMANUELLI, MELBA –*Professor*; MD, 1978, University of Puerto Rico - Medical Sciences Campus.

FELICIANO-VALLS, CALEB E. - *Assistant Professor;* MD, 2001, University of Puerto Rico - Medical Sciences Campus.

FERNÁNDEZ DÁVILA, NATALIA - *Assistant Professor;* MD, 2017, University of Puerto Rico - Medical Sciences Campus.

FERNÁNDEZ-BAHAMONDE, JORGE L. - *Professor*; MD, 1981, University of Puerto Rico - Medical Sciences Campus.

FERNÁNDEZ-CARBIA, PAMELA - *Assistant Professor*; MD, 2009, Universidad Central del Caribe - Puerto Rico.

FERNÁNDEZ-LUBE, DAVID E.- *Professor;* MD, 1983, University of Puerto Rico - Medical Sciences Campus.

FERNÁNDEZ-REPOLLET, EMMA - *Professor*; PhD, 1979, University of Puerto Rico - Medical Sciences Campus.

FERNÁNDEZ-SIFRE, CARLOS - *Associate Professor;* MD, 1981, University of Puerto Rico - Medical Sciences Campus.

FERNÁNDEZ-SOLTERO, DANIEL E. - *Professor*; MD, 1997, University of Puerto Rico - Medical Sciences Campus.

FIGUEROA DIEZ, MARIO- *Assistant Professor*; MD, 1987, University of Puerto Rico - Medical Sciences Campus.

FIGUEROA-GUZMÁN, LUZ D. - *Professor*; MD, 1979, University of Puerto Rico - Medical Sciences Campus.
FIGUEROA-ROSARIO, ROCHELINE - *Assistant Professor;* MD, 1998, Universidad Autónoma de Guadalajara - México.
FIORITO-TORRES, FRANCHESCA – *Assistant Professor*; MD, 2010, University of Puerto Rico - Medical Sciences Campus.
FLORES-BORIA, LICETTE M. - *Associate Professor;* MD, 1986, University of Puerto Rico - Medical Sciences Campus.
FONTÁNEZ-SULLIVAN, FELIPE F. - *Assistant Professor*; MD, 1980, University of Puerto Rico - Medical Sciences Campus.
FOY-PARILLA, CHRISTIAN A. - *Assistant Professor;* MD, 2003, University of Puerto Rico - Medical Sciences Campus.
FRANQUI-RIVERA, HILTON - *Assistant Professor;* MD, 2004, University of Puerto Rico - Medical Sciences Campus.
FRED-JIMÉNEZ, RUTH M. – Assistant Professor; MD, 2009, Ponce School of Medicine and Health Sciences – Puerto Rico.
FREIRE PÉREZ, ARNALDO L. - *Adjunct Professor;* MD, 2017, University of Puerto Rico - Medical Sciences Campus.
FRONTERA-ROURA, WALTER R. – Professor; MD, 1979, University of Puerto Rico - Medical Sciences Campus.
GARCÍA DE JESÚS, RICARDO – *Associate Professor;* MD, 1995, University of Puerto Rico - Medical Sciences Campus.
GARCÍA RIVERA, ENID J. - A*ssistant Professor;* MD, 1996, University of Puerto Rico - Medical Sciences Campus.
GARCIA-CASTIÑEIRAS, SIXTO - *Professor*; MD, 1967, Universidad Complutense - Spain; PhD, 1976, University of Puerto Rico - Medical Sciences Campus.
GARCÍA-COLÓN, MARIBEL - *Assistant Professor;* MD, 1990, University of Puerto Rico - Medical Sciences Campus.
GARCÍA-DE LA ROSA, DENIZ E. - *Assistant Professor;* MD, 1997, University of Puerto Rico - Medical Sciences Campus.
GARCÍA-FRAGOSO, LOURDES - *Professor;* MD, 1992, Universidad Central del Caribe - Puerto Rico.
GARCÍA-GARCÍA, INÉS - *Professor;* MD, 1988, University of Puerto Rico - Medical Sciences Campus.
GARCÍA-GARCÍA, JOSÉ M. - *Assistant Professor*; MD, 1978, Universidad de Sevilla - Spain.
GARCÍA-IRIZARRY, LUIS - *Assistant Professor*; MD, 2007, University of Puerto Rico - Medical Sciences Campus.
GARCÍA-PALLAS, MARÍA V. - *Assistant Professor;* MD, 1990, Instituto Superior de Ciencias Médicas de Villa Clara - Cuba.
GARCÍA-PUEBLA, ANA C. - *Assistant Professor;* MD, 2007, University of Puerto Rico - Medical Sciences Campus.
GARCÍA-RIVERA, ENID J. - *Assistant Professor;* MD, 1996, University of Puerto Rico - Medical Sciences Campus.
GARCÍA-RODRÍGUEZ, OMAR – Adjunct Professor; DrPH, 2012, University of Puerto Rico - Medical Sciences Campus.
GARRATÓN-MARTÍN, MIGUEL R. – *Associate Professor*; MD, 1985, University of Puerto Rico - Medical Sciences Campus.
GELY-ROJAS, LETICIA – *Assistant Professor*; MD, 2010, University of Puerto Rico - Medical Sciences Campus.
GERENA-LÓPEZ, YAMIL - *Professor;* PhD, 2005, University of Puerto Rico - Medical Sciences Campus.
GIRALDEZ-RODRÍGUEZ, LAUREANO A. - *Assistant Professor*; MD, 2007, University of Puerto Rico - Medical Sciences Campus.
GODOY-VITORINO, FILIPA - *Associate Professor*; PhD, 2009, University of Puerto Rico Rio Piedras, Postdoc 2009-2012, US Department of Energy, Joint Genome Institute
GONZÁLEZ KEELAN, CARMEN I. - *Professor*; MD, 1979, University of Puerto Rico - Medical Sciences Campus.
GONZÁLEZ- MÉNDEZ, RICARDO - *Professor*; PhD, 1987, Standford University - California.

GONZÁLEZ PAGÁN, JAHZEL M. – *Assistant Professor*; MD, 2008, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-AQUINO, CARLOS - *Professor*; MD, 1979, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-CARABALLO, ZULMA A. - *Professor*; MD, 1974, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-COLÓN, KAROLYN - *Social Worker I*, MSW, 2014, Inter American University of Puerto Rico

GONZÁLEZ-GALARZA, JOMAIRY – *Psychologist I*; Phd, 2007, Carlos Albizu University – Puerto Rico.

GONZÁLEZ-MELENDEZ, ARIANA - *Assistant Professor;* MD, 2016, Ponce School of Medicine and Health Sciences – Puerto Rico.

GONZÁLEZ-MONTALVO, ADEL – Assistant Professor; MD, 2018, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-NAVARRETE, GLADYS H. - *Professor;* MD, 1979, University of Puerto Rico - Medical Sciences Campus; JD, 1999, University of Puerto Rico - Río Piedras Campus.

GONZÁLEZ-OLMO, JOSÉ - *Assistant Professor;* MD, 1977, Universidad Nacional Pedro Henríquez Ureña - Dominican Republic.

GONZÁLEZ-PAGÁN, JAHZEL M. – *Assistant Professor*; MD, 2008, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-RAMOS, MICHELLE M. - *Associate Professor;* MD, 1999, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-RIVERA, ALEXIS- *Assistant Professor;* MD, 2012, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-RIVERA, HENRY - *Assistant Professor;* MD, 1993, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-RODRÍGUEZ, ANARDA - *Professor*; MD, 1977, Universidad de Zaragoza - Spain.

GONZÁLEZ-RODRÍGUEZ, LOIDA A. - *Assistant Professor*; MD, 2008, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-RODRÍGUEZ, MANUEL - *Assistant Professor;* MD, 1985, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-ROSARIO, RAFAEL - *Assistant Professor;* MD, 2005, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-SÁNCHEZ, JUAN A. - *Professor*; MD, 1986, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-SANTONI, RICARDO E. - A*ssociate Professor;* MD, 1986, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-TAÚLL, ROSALINDA - *Assistant Professor*; MD, 1980, Universidad Central del Caribe - Puerto Rico.

GONZÁLEZ-VÉLEZ, NANETTE – *Assistant Professor*; MD, 2000, University of Puerto Rico - Medical Sciences Campus.

GORBEA-ALONSO, HÉCTOR F. - *Professor;* MD, 1977, University of Puerto Rico - Medical Sciences Campus.

GORROCHATEGUI-RODRÍGUEZ, MARTÍN - *Assistant Professor;* MD, 1980, University of Puerto Rico - Medical Sciences Campus.

GREGORY-GONZÁLEZ, FEDERICO J.- *Assistant Professor;* MD, 2000, Universidad Central del Caribe - Puerto Rico.

GUERRERO-PRESTON, RAFAEL E. - *Adjunct Professor;* DrPh, 2004, University of Puerto Rico - Medical Sciences Campus.

GUERRIOS RIVERA, LOURDES - *Adjunct Professor*; MD, 2000, University of Puerto Rico - Medical Sciences Campus.

GUIOT-MARTÍNEZ, HUMBERTO M. – *Associate Professor;* MD, 2001, University of Puerto Rico - Medical Sciences Campus.

GUIVEN-LÓPEZ, ANNIE - *Assistant Professor;* MD, 1997, University of Puerto Rico - Medical Sciences Campus.

GUZMÁN-PÉREZ, HUMBERTO M. - *Assistant Professor*; MD, 1999, University of Puerto Rico - Medical Sciences Campus.

HALLMAN-NAVARRO, DEANA - *Assistant Professor;* MD, 1983, University of Puerto Rico - Medical Sciences Campus.

HAWAYEK-ALEMAÑY, JOSÉ - *Professor;* MD, 1972, University of Puerto Rico - Medical Sciences Campus.

HECHAVARRÍA GÓMEZ, ROSA M. - *Psychologist II*; PhD, 2004, Carlos Albizu University - Puerto Rico.

HERNÁNDEZ-DENTON, JORGE - *Associate Professor;* MD, 1973, University of Puerto Rico - Medical Sciences Campus.

HERNÁNDEZ-MARTÍNEZ, CARMIÑA – Adjunct Professor; MD, 1981, University of Puerto Rico - Medical Sciences Campus.

HERNÁNDEZ-RIVERA, PEDRO J. - *Assistant Professor*; MD, 2005, University of Puerto Rico - Medical Sciences Campus.

HERNÁNDEZ-SUCARICHI, JORGE L. - *Assistant Professor;* MD, 1976, Universidad de Zaragoza - Spain.

HERREÑO-SAENZ, DIÓGENES - *Associate Professor*; PhD, 1986, University of Puerto Rico - Rio Piedras Campus.

HERRERA-RIVERA, DELIA - *Social Worker IV;* MSW, 1977, University of Puerto Rico - Río Piedras Campus.

IMBERT-GARRATÓN, MANUEL E. - *Assistant Professor;* MD, 1983, University of Puerto Rico - Medical Sciences Campus.

INSERNI-MILÁN, JAIME A. - *Professor*; MD, 1983, University of Puerto Rico - Medical Sciences Campus.

IRANZO-GONZÁLEZ, MAURO - *Assistant Professor*; MD, 2000, University of Puerto Rico - Medical Sciences Campus.

JAVADOV, SABZALI A. - *Professor*; MD, 1983, Russian State Medical University - Russia; PhD, 1986, Cardiology Research Center - Russia.

JIMÉNEZ-ALMODÓVAR, MARÍA C. – *Assistant Professor*; MD, 2006, Ponce School of Medicine and Health Sciences – Puerto Rico.

JIMÉNEZ-CRUZ, JUAN C. - *Assistant Professor;* MD, 1982, Universidad Autónoma de Guadalajara - México.

JIMÉNEZ-HUYKE, CARLOS J. - *Assistant Professor;* MD, 2000, University of Puerto Rico - Medical Sciences Campus.

JIMÉNEZ-LEE, RICARDO A. - *Assistant Professor;* MD, 1997, University of Puerto Rico - Medical Sciences Campus.

JIMÉNEZ-ORTIZ, EMILIO - *Instructor*; MD, 1966, University of Puerto Rico - Medical Sciences Campus.

JIMÉNEZ-RIVERA, CARLOS A. - *Professor*; PhD, 1986, University of New Mexico, Albuquerque, New Mexico

JIMÉNEZ-VELÁZQUEZ, IVONNE Z. - *Professor;* MD, 1982, University of Puerto Rico - Medical Sciences Campus.

JIMÉNEZ-VELEZ, BRAULIO - *Professor;* PhD, 1981, University of Puerto Rico - Mayagüez Campus.

JOGLAR-IRIZARRY, FERNANDO L.- *Associate Professor*; MD, 1998, University of Puerto Rico - Medical Sciences Campus.

JORDÁN-DÍAZ, NAMIR - *Psychologist IV*; PhD, 2008, Carlos Albizu University - Puerto Rico.

JORGE-RIVERA, JUAN C. - *Professor*; PhD, 1997, Brandeis University, Massachusetts.

JOY-PÉREZ, CRISTINA M. – Assistant Professor; MD, 2010, Ponce School of Medicine and Health Sciences – Puerto Rico.

KENSLER-BONEWITS, ROBERT W. - *Professor*; PhD, 1978, State University of New York.

LABAT-ÁLVAREZ, EDUARDO J. - *Assistant Professor*; MD, 2005, University of Puerto Rico - Medical Sciences Campus.

LAGUNA-FIGUEROA, REINALDO R. - *Professor*; MD, 1989, University of Puerto Rico - Medical Sciences Campus.

LARA-DEL RÍO, JOSÉ A. - *Assistant Professor*; MD 2008, University of Puerto Rico - Medical Sciences Campus.

LAUREANO-CUADRADO, ÁNGEL F. - *Associate Professor;* MD, 1985, University of Puerto Rico - Medical Sciences Campus.

LAZARO MUÑOZ, GABRIEL – *Ad Honorem Professor*; PhD, 2010, New York University.

LEBRÓN-ARZÓN, FRANCISCO A. – *Associate Professor;* MD, 2000, University of Puerto Rico - Medical Sciences Campus.

LEÓN-VÁZQUEZ, RUTH G. – *Assistant Professor*; PhD, 2005, University of Puerto Rico – Medical Sciences Campus.

LLUCH-RAMÍREZ, NORMAN – Assistant Professor; MD, 1988, University of Puerto Rico - Medical Sciences Campus.

LOJO-SOJO, LUIS F. - *Associate Professor*; MD, 2002, University of Puerto Rico - Medical Sciences Campus.

LOJO-VÁZQUEZ, JUAN J. - *Professor*; MD, 1972, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ DE VICTORIA, JUAN C. - *Assistant Professor*; MD, 2001, Universidad Central del Caribe - Puerto Rico.

LÓPEZ MALDONADO, MELANY – *Adjunct Professor*; MA, 2018, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ MIARES, ADOLFO – *Adjunct Professor*; MD, 1997, Universidad Complutense Madrid.

LÓPEZ-ACEVEDO, CARMEN E. - *Professor;* MD, 1977, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-ÁLVAREZ, YANIA M. - *Assistant Professor*; MD, 2009, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-BAQUERO, RAFAEL – *Adjunct Professor*; MD, 2001, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-ENRÍQUEZ, ALBERTO T. - *Professor;* MD, 1979, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-ENRÍQUEZ, REYNOLD - *Professor*; MD, 1971, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-GONZÁLEZ, FRANCISCO M. - *Professor*; MD, 1995, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-HIDALGO, VICENTE - *Assistant Professor*; MD, 1979, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-QUINTERO, MARÍA M. - *Assistant Professor;* MD, 2006, University of Puerto Rico - Medical Sciences Campus.

LOZADA-CAPRILES, YOLIANNE - *Assistant Professor*; MD, 2012, University of Puerto Rico - Medical Sciences Campus.

LOZADA-FIGUEROA, DAVID - *Assistant Professor*; MD, 2005, Universidad Central del Caribe - Puerto Rico.

LUBE-CAPÓ, JEANNETTE - *Professor;* MD, 1978, Universidad Autónoma de Guadalajara - México.

LUCIANO-ROMÁN, CARLOS A. - *Professor*; MD, 1985, University of Puerto Rico - Medical Sciences Campus.

LUGO-AMADOR, NANNETTE M. - *Assistant Professor*; MD, 1998, University of Puerto Rico - Medical Sciences Campus.

LUGO-CALZADA, LISSETTE A. - *Professor;* MD, 1986, University of Puerto Rico - Medical Sciences Campus.

LUGO-LUGO, EDWIN I. - *Assistant Professor*; MD, 1979, University of Puerto Rico - Medical Sciences Campus.

LUGO-VICENTE, HUMBERTO L. - *Professor*; MD, 1979, University of Puerto Rico - Medical Sciences Campus.

LYNCH-GONZÁLEZ, LAUREN - *Associate Professor;* MD, 1981, University of Puerto Rico - Medical Sciences Campus.

MACHADO-ESPIET, RAMÓN - *Assistant Professor;* MD, 1994, Universidad Autónoma de Guadalajara - México.

MALAVET-PANTOJAS, JULIA T. - *Assistant Professor;* MD, 1988, University of Puerto Rico - Medical Sciences Campus.

MALDONADO QUINTANA, HIRAM J. – *Assistant Professor*; MD, 2011, Universidad Autónoma de Guadalajara.

MALDONADO-DURÁN, MAYRA – Assistant Professor; MD, 2004, Universidad Central de Caribe – Puerto Rico.

MALDONADO-VARGAS, JOSÉ A. - *Assistant Professor*; MD, 2003, University of Puerto Rico - Medical Sciences Campus.

MALINOW-MACEO, IONA K. - *Assistant Professor;* MD, 1992, University of Rochester.

MARCOS-MARTÍNEZ, MARÍA J. - *Professor*; MD, 1987, University of Navarra - Spain.

MARGARIDA-JULIÁ, MARÍA T. - *Professor;* PhD, 1987, Harvard University School of Medicine.

MARIE-BORDES, BRUNO – *Joint Appointment with Institute of Neurobiology*; PhD, 1999, University of Sussex, Brighton, United Kingdom.

MARÍN-LÓPEZ, JOSÉ E. - *Assistant Professor*; MD, 1991, University of Puerto Rico - Medical Sciences Campus.

MARRERO-AMADEO, DERIK - *Associate Professor* of the School of Dental Medicine; Joint Appointment; MD, 2004, University of Puerto Rico – Medical Sciences Campus.

MARRERO-ORTIZ, PABLO V. - *Associate Professor*; MD, 1985, University of Puerto Rico - Medical Sciences Campus.

MARTÍN-DE PUMAREJO, MILAGROS - *Professor;* MD, 1978, University of Puerto Rico - Medical Sciences Campus.

MARTÍNEZ-DE ANDINO-LORENZÓN, RICHARD – *Professor*, MD, 1976, Thomas Jefferson Medical School, Pennsylvania.

MARTÍNEZ-GONZÁLEZ, KAREN G. - *Associate Professor*; MD, 2001, University of Puerto Rico - Medical Sciences Campus.

MARTÍNEZ-MARTELL, EDILBERTO - *Associate Professor;* MD, 1983, University of Puerto Rico - Medical Sciences Campus.

MARTÍNEZ-MARTÍNEZ, IDALÍ - *Professor*; PhD, 1995, Rutgers University, New Jersey.

MARTÍNEZ-MELÉNDEZ, DAVID E.- *Professor;* MD, 1975, University of Puerto Rico - Medical Sciences Campus.

MARTÍNEZ-RODRÍGUEZ, MELIZA - *Assistant Professor;* MD, 2004, University of Puerto Rico - Medical Sciences Campus.

MARTÍNEZ-SANTIAGO, GLENDA - *Assistant Professor;* MD, 1989, Universidad Central del Caribe - Puerto Rico.

MARTÍNEZ-TORO, JOSÉ A. - *Associate Professor;* MD, 1976, University of Puerto Rico - Medical Sciences Campus.

MARTÍNEZ-VÁZQUEZ, ROSA A. – *Assistant Professor;* MD, 2011, San Juan Bautista School of Medicine – Puerto Rico.

MARTÍNEZ-VÉLEZ, ÁNGELES - *Social Worker IV,* MA, 1980, University of Puerto Rico - Río Piedras Campus.

MARTIN-GARCÍA, RAFAEL F. - *Professor*; MD, 1988, University of Puerto Rico - Medical Sciences Campus.

MARTINS-BACCIN, ANTONIO H. – *Associate Professor*; PhD, 2006, Federal University of São Paulo –Brazil.

MAS, MANUEL - *Assistant Professor*; MD, 2006, University of Puerto Rico - Medical Sciences Campus.

MASSANET-VOLLRATH, JOSÉ - *Assistant Professor*; MD, 2004, Ponce School of Medicine and Health Sciences - Puerto Rico.

MATÍAS-GONZÁLEZ, ISRAEL - *Associate Professor;* MD, 2002, Universidad Autónoma de Guadalajara - México.

MATOS-RIVERA, IRIS A. - *Social Worker I;* MA, 2003, University of Puerto Rico - Río Piedras Campus.

MAYMÍ-RIVERA, JOSÉ A. – Assistant Professor; MD, 1980, University of Puerto Rico – Medical Sciences Campus.

MAYOL-URDAZ, MAGDIEL - *Assistant Professor*; MD, 1998, University of Puerto Rico - Medical Sciences Campus.

MCCARTHY-NAZARIO, VILMA T. - *Associate Professor*; MD, 1995, University of Puerto Rico - Medical Sciences Campus.

MEDINA-DELGADO, IRMA R. - *Assistant Professor*; MS, 1993, University of Wisconsin - Madison.

MEDINA-GONZÁLEZ, YAILIS - *Associate Professor;* MD, 2008, University of Puerto Rico - Medical Sciences Campus.

MEDINA-RUIZ, ARTURO - *Professor;* MD, 1967, University of Puerto Rico - Medical Sciences Campus.

MEDINA-ZAYAS, JOSIEL – *Associate Professor*; MD, 2010, University of Puerto Rico - Medical Sciences Campus.

MEJÍAS-SOTO, ANA H. - *Assistant Professor*; MD, 1991, University of Puerto Rico - Medical Sciences Campus.

MELÉNDEZ-APONTE, LOYDA M. - *Professor*; PhD, 1990, Emory University - Atlanta, GA.

MELÉNDEZ-TORRES, MARÍA T. - *Assistant Professor*; MD, 1990, University of Puerto Rico - Medical Sciences Campus.

MÉNDEZ-LATALLADI, WILLIAM - *Professor*; MD, 1992, University of Puerto Rico - Medical Sciences Campus.

MÉNDEZ-MARTÍNEZ, KEIMARI - *Assistant Professor;* MD, 2006, University of Puerto Rico - Medical Sciences Campus.

MÉNDEZ-RIVERA, ROSARIO N. - *Assistant Professor*; MD, 1991, Universidad Central del Caribe - Puerto Rico.

MENDOZA-VILLAHERMOA, ODALYS – *Assistant Professor;* MD, 1989, University of Puerto Rico - Medical Sciences Campus.

MERA-LASTRA, ROBERTO E. - *Assistant Professor;* MD, 1997, University of Puerto Rico - Medical Sciences Campus.

MERCADO-ALVARADO, JOANNA - *Assistant Professor*; MD, 2000, Ponce School of Medicine and Health Sciences - Puerto Rico.

MERCADO-CASTRO, KATIA L. - *Assistant Professor;* MD, 2000, University of Puerto Rico - Medical Sciences Campus.

MERCADO-JIMÉNEZ, HIRAM J. - *Assistant Professor;* MD, 1962, Universidad Autónoma de Madrid- Spain.

MESA-PABÓN, MARCEL A. – *Assistant Professor*; MD, 2010, University of Puerto Rico - Medical Sciences Campus.

MICHEO-MARTÍNEZ, WILLIAM F. - *Professor*; MD, 1982, University of Puerto Rico - Medical Sciences Campus.

MILLÁN-APONTE, ISMENIO - *Associate Professor;* MD, 1983, Universidad Cetec - Dominican Republic.

MILLER-STEIN, MARK W. - *Professor*; PhD, 1980, University of Connecticut.

MIRANDA RIVAS, ÁNGELA, *Assistant Professor;* MD, 2014, University of Puerto Rico - Medical Sciences Campus.

MIRANDA-DELGADO, HÉCTOR S. - *Assistant Professor;* MD, 1986, University of Puerto Rico - Medical Sciences Campus.

MIRANDA-GONZÁLEZ, JORGE D. - *Professor*; PhD, 1996, Baylor College of Medicine - Houston, Texas.

MOJICA-MAÑOSA, PABLO L. - *Assistant Professor*; MD, 1997, University of Puerto Rico - Medical Sciences Campus.

MOLINA-DAPENA, RAFAEL J. – Assistant Professor; MD, 1983, University of Puerto Rico - Medical Sciences Campus.

MONTAÑEZ-HUERTAS, JOSÉ M. - *Assistant Professor*; MD, 1976, Universidad Autónoma de Guadalajara - México.

MONTES-PAGÁN, JOSÉ R. - *Professor*; MD, 1989, University of Puerto Rico - Medical Sciences Campus.

MORALES-FRANQUI, MYRNA I. - *Associate Professor;* MD, 1992, University of Puerto Rico - Medical Sciences Campus.

MORALES-GUASCH, GINEIDA - *Associate Professor*; EdD, 2003, University of Puerto Rico - Río Piedras Campus.

MORALES-RALAT, ASTRID - *Associate Professor*; MD, 1995, University of Puerto Rico - Medical Sciences Campus.

MORALES-TORRES, YANIRA - *Assistant Professor*; MD, 1997, University of Puerto Rico - Medical Sciences Campus.

MORA-PIÑERO, EDNA M. - *Professor*; MD, 1986, University of Puerto Rico - Medical Sciences Campus.

MOSCOSO-MOSCOSO, RICARDO A. - *Professor;* MD, 1980, University of Puerto Rico - Medical Sciences Campus.

MOYA-HUFF, PAQUITA L. - *Associate Professor;* MD, 1983, University of Puerto Rico - Medical Sciences Campus.

MUÑIZ ALERS, SAISHA- *Assistant Professor*; MD, 2012, University of Puerto Rico - Medical Sciences Campus.

MUÑIZ RIVERA, JORGE - *Associate Professor;* MD, 1984, University of Puerto Rico - Medical Sciences Campus.

MUÑIZ VELEZ, EDUARDO J. - *Assistant Professor;* MD, 1994, University Central Caribe - Medical Sciences Campus.

MUÑIZ-GONZÁLEZ, JESÚS - *Associate Professor;* MD, 1984, University of Puerto Rico - Medical Sciences Campus.

MUÑOZ MATTA, ANA - *Assistant Professor;* MD, 2010, University Central Caribe - Medical Sciences Campus.

MURRAY ORTIZ, GISELA- *Assistant Professor*; MD, 2005, University of Puerto Rico - Medical Sciences Campus.

NARVÁEZ-PÉREZ, KARLA M. – Adjunct Professor; PhD, 2011, Inter American University of Puerto Rico.

NAZARIO-JIMÉNEZ, SYLVETTE - *Associate Professor;* MD, 1987, University of Puerto Rico - Medical Sciences Campus.

NAZARIO-RODRÍGUEZ, LELIS L. - *Professor*; MD, 1993, Universidad Central del Caribe - Puerto Rico.

NEGRÍN-GARCÍA, GISELA – *Assistant Professor*; MD, 1988, University of Puerto Rico - Medical Sciences Campus.

NEGRÓN-GONZÁLEZ, VIVIANA M. - *Assistant Professor*; MD, 2003, University of Puerto Rico - Medical Sciences Campus.

NEGRONI BALASQUIDE, XAYMATA – *Assistant Professor;* MD, 2007, Universidad Autónoma de Guadalajara.

NEGRÓN-PAGÁN, JUANITA – *Associate Professor;* MD, 1994, University of Puerto Rico - Medical Sciences Campus.

NEGRÓN-RIVERA, JUAN C. - *Associate Professor*; MD, 1980, University of Puerto Rico - Medical Sciences Campus.

NEVÁREZ POMALES, OSCAR W. – *Assistant Professor*; MD, 2014, University of Puerto Rico - Medical Sciences Campus.

NEVÁREZ-ALONSO, CARMEN M. - *Instructor*; MS, 1990, University of Puerto Rico - Río Piedras Campus.

NEVÁREZ-MARRERO, JUAN A. - *Associate Professor*; MD, 1980, University of Puerto Rico - Medical Sciences Campus.

NIEVES PLAZA, MARIELY. - *Adjunct Professor*; MA, 2005, University of Puerto Rico – Río Piedras.

NIEVES RIVERA, JUAN J. -*Assistant Professor;* MD, 2012, University of Puerto Rico - Medical Sciences Campus.

NIEVES-COLOMER, WILFREDO - *Assistant Professor*; MD, 1986, Ponce School of Medicine and Health Sciences - Puerto Rico.

NIEVES-RIVERA, FRANCISCO - *Professor;* MD, 1996, University of Puerto Rico - Medical Sciences Campus.

NUÑEZ MORALES, CRISTINA- *Assistant Professor*; MD, 2016, University of Puerto Rico - Medical Sciences Campus.

OCASIO-LÓPEZ, CARLOS J. – *Assistant Professor*; MD, 2007, University of Puerto Rico - Medical Sciences Campus.

OCASIO-MELÉNDEZ, ILEANA E. - *Assistant Professor*; MD, 2009, University of Puerto Rico - Medical Sciences Campus.

OJEDA-BOSCANA, IVONNE L. – *Associate Professor*; MD, 1982, University of Puerto Rico - Medical Sciences Campus.

OLAVARRÍA-CRUZ, MAYRA – *Associate Professor;* PhD, 2003, University of Puerto Rico - Medical Sciences Campus.

OLIVERAS-MÁRQUEZ, ROBERTO E. - *Assistant Professor;* MD, 2000, University of Maryland.

OLIVER-CRUZ, ARMANDO L. – *Associate Professor;* MD, 1998, University of Puerto Rico - Medical Sciences Campus.

OLIVIERI-BEAUCHAMP, VILMA N. - *Assistant Professor*; MD, 1986, University of Puerto Rico - Medical Sciences Campus.

OMS-LOYOLA, LUIS J. - *Assistant Professor*; MD, 1963, University of Puerto Rico – Medical Sciences

OQUENDO DEL TORO, HELEN M. - *Assistant Professor;* MD, 2012, University of Puerto Rico - Medical Sciences Campus.

OQUENDO-OCASIO, YIAMIRA S. – *Assistant Professor*; MD, 2006, Universidad Autónoma de Guadalajara – México.

ORTEGA-GIL, JORGE - *Professor;* MD, 1965, Universidad Peruana Cayetano – Perú.

ORTIZ-CARRASQUILLO, ALBERTO - *Assistant Professor*; MD, 1979, Universidad Central del Este - Dominican Republic.

ORTIZ-GÓMEZ, ADELAIDA T. - *Assistant Professor;* MD, 1997, University of Puerto Rico - Medical Sciences Campus.

ORTIZ-GÓMEZ, CRISTINA - *Assistant Professor*; MD, 2001, University of Puerto Rico - Medical Sciences Campus.

ORTIZ-GONZÁLEZ, LUIS E. - *Assistant Professor*; MD, 2008, University of Puerto Rico - Medical Sciences Campus.

ORTIZ-HERNÁNDEZ, MELISSA - *Assistant Professor*; MD, 2005, University of Puerto Rico - Medical Sciences Campus.
ORTIZ-JUSTINIANO, VICTOR N. - *Professor*; MD, 1987, University of Puerto Rico - Medical Sciences Campus.
ORTIZ-MATOS, NERIAN - *Professor;* MD, 1998, University of Puerto Rico - Medical Sciences Campus.
ORTIZ-NOLASCO, REINALDO - *Assistant Professor*; MD, 1981, University of Puerto Rico - Medical Sciences Campus.
ORTIZ-ORTIZ, IDITH R. - *Professor;* MD, 1976, University of Puerto Rico - Medical Sciences Campus.
ORTIZ-ROQUE, JOSÉ G. - *Professor;* PhD, 1982, University of Connecticut.
OTERO-LÓPEZ, ANTONIO M. - *Associate Professor*; MD, 1998, University of Puerto Rico - Medical Sciences Campus.
OTERO-LÓPEZ, FRANCISCO J. - *Associate Professor*; MD, 2000, University of Puerto Rico - Medical Sciences Campus.
PABÓN-VILLAFAÑE, ÁNGEL L. - *Assistant Researcher;* MS, 1990, University of Puerto Rico - Medical Sciences Campus.
PACHECO-HERNÁNDEZ, EILEEN I. - *Associate Professor;* MD, 1977, University of Puerto Rico - Medical Sciences Campus.
PACHECO-LÓPEZ, PAULETTE C. - *Assistant Professor*; MD, 2007, University of Puerto Rico - Medical Sciences Campus.
PACHECO-MARTÍNEZ, PRINCESS - *Instructor*; MEd, 2003, University of Puerto Rico - Río Piedras Campus.
PACHECO-VEGA, ÁNGEL - *Assistant Professor;* MD, 1995, Ponce School of Medicine and Health Sciences - Puerto Rico.
PADILLA-RODRÍGUEZ, KATHERINE M. - *Assistant Professor;* MD, 2005, University of Puerto Rico - Medical Sciences Campus.
PADRÓ-CASTRO, ENRIQUE - *Assistant Professor*; MD, 1978, Universidad Autónoma de Guadalajara - México.
PAGAN TORRES, ANGEL- *Assistant Professor*; MD, 2009, University of Puerto Rico - Medical Sciences Campus.
PAGÁN-CASTRO, ANNETTE - *Professor*; MD, 1976, Universidad Nacional Pedro Henríquez Ureña - Dominican Republic.
PAGÁN-FELICIANO, ELIZABETH - *Assistant Professor;* MD, 1994, University of Puerto Rico - Medical Sciences Campus.
PASCUAL-MARRERO, JEAMARIE – Assistant Professor; MD, 2012, University of Puerto Rico - Medical Sciences Campus.
PASTRANA-LABORDE, RAFAEL - *Assistant Professor;* MD, 1999, University of Puerto Rico - Medical Sciences Campus.
PAVÍA-CABANILLAS, ANTONIO M. - *Associate Professor*; MD, 1980, Universidad Central del Caribe - Puerto Rico.
PEDRAZA-ROSA, GRISEL M. - *Associate Professor*; MD, 2001, University of Puerto Rico - Medical Sciences Campus.
PEDROGO-RODRÍGUEZ, YASMÍN - ~~*Associate*~~ *Professor;* MD, 2001, University of Puerto Rico - Medical Sciences Campus.
PELET-MEJÍAS, JORGE I. - *Assistant Professor*; MD, 1987, University of Puerto Rico - Medical Sciences Campus.
PÉREZ-ACEVEDO, NIVIA L. - *Professor*; PhD, 2001, University of Puerto Rico - Río Piedras Campus.
PÉREZ-BERENGUER, JUAN L. - *Adjunct Professor;* MD, 1977, Universidad La Habana - Cuba.
PÉREZ-BRAYFIELD, MARCOS R. - *Associate Professor;* MD, 1996, University of Puerto Rico.
PÉREZ-DÍAZ, LISSETE Y. - Assistant Professor; MD, 1988, University of Puerto Rico - Medical Sciences Campus.
PÉREZ-KRAFT, GLADYS - *Associate Professor*; MD, 1975, University of Puerto Rico - Medical Sciences Campus.
PÉREZ-MITCHELL, CARLOS - *Assistant Professor*; MD, 2001, Ponce School of Medicine and Health Sciences - Puerto Rico.
PÉREZ-SOTO, NOEL - *Assistant Professor*; MD, 1995, Universidad Central del Caribe - Puerto Rico.
PÉREZ-TORRES, RAÚL - *Professor*; MD, 1973, University of Puerto Rico - Medical Sciences Campus.
PIOVANETTI-PÉREZ, IAN K. - *Assistant Professor*; MD, 1994, Universidad Central del Caribe - Puerto Rico.

PITA-GARCÍA, IGNACIO L. - *Associate Professor;* MD, 2001, University of Puerto Rico - Medical Sciences Campus.

PORTELA-ARRAIZA, JUAN C. - *Assistant Professor;* MD, 1996, University of Puerto Rico - Medical Sciences Campus.

PRESTON, ALAN M. – *Professor Emeritus; Ad Honorem*; PhD, 1971, Purdue University

PUIG CARRION, GISELA D. - *Assistant Professor;* MD, 2011, Universidad San Juan Bautista, Puerto Rico.

PURAS-BÁEZ, ANTONIO - *Professor*; MD, 1978, University of Puerto Rico - Medical Sciences Campus.

QUINTERO-NORIEGA, AIDA L. – *Assistant Professor*; MD, 1985, University of Puerto Rico - Medical Sciences Campus.

QUINTERO-NORIEGA, MARÍA DEL C. – *Associate Professor;* MD, 1988, University of Puerto Rico - Medical Sciences Campus.

QUIÑONES-FELICIANO, MYRNA L. - *Professor;* MD, 1980, University of Puerto Rico - Medical Sciences Campus.

QUIRK, GREGORY – *Ad Honorem; Professor*, PhD, 1990, SUNY Health Science Center - Brooklyn, New York.

QUIRK, GREGORY J. - *Professor*; PhD, 1990, State University of New York.

RAMÍREZ-VICK, MARGARITA I. - *Professor;* MD, 1989, University of Puerto Rico - Medical Sciences Campus.

RAMOS-ACEVEDO, JUAN – Assistant Professor; MD, 2007, Ponce School of Medicine and Health Sciences – Puerto Rico.

RAMOS-CORTÉS, EDWARDO - *Professor*; MD, 1989, University of Puerto Rico - Medical Sciences Campus.

RAMOS-FERNÁNDEZ, MARÍA R. - *Assistant Professor*; MD, 2006, University of Puerto Rico - Medical Sciences Campus.

RAMOS-MALDONADO, GLADYS A. - *Assistant Professor*; MD, 2002, University of Puerto Rico - Medical Sciences Campus.

RAMOS-MELÉNDEZ, EDIEL – *Adjunct Professor*, MPH, 2013, University of Puerto Rico - Medical Sciences Campus.

RAMOS-RIVERA, GLORIA – *Assistant Professor*; MD, 2013, Ponce School of Medicine and Health Sciences – Puerto Rico.

RAMOS-ROMEY, CRISTINA J. - *Assistant Professor;* MD, 2003, University of Puerto Rico - Medical Sciences Campus.

RAMOS-SANTIAGO, SONIA J. - *Assistant Professor;* MD, 1990, San Juan Bautista School of Medicine - Puerto Rico.

RASSI-STELLA, NICOLE - *Assistant Professor;* MD, 2009, University of Puerto Rico - Medical Sciences Campus.

RESTO-MELÉNDEZ, LEDITH – Adjunct Professor; MS, 1995, University of Puerto Rico - Medical Sciences Campus.

REYES MAYSONET, JOAHNIBEL, - *Assistant Professor*; MD, 2015, San Juan Bautista - Medical Sciences Campus.

REYES-BOU, ZAYHARA – *Associate Professor;* MD, 2002, Universidad Central del Caribe - Puerto Rico.

REYES-MARTÍNEZ, PEDRO J. - *Associate Professor*; MD, 1984, University of Puerto Rico - Medical Sciences Campus.

REYES-PÉREZ, MEILYN – *Assistant Professor*; MD, 2003, University of Puerto Rico - Medical Sciences Campus.

REYES-TORRES, JOSÉ S. - Assistant Professor; MD, 2004, University of Puerto Rico - Medical Sciences Campus.

RIERA-MARCH, ANTONIO - *Professor*; MD, 1975, Universidad de Zaragoza - Spain.

RÍOS-MOTTA, MIRIAM - *Associate Professor;* MD, 1990, University of Puerto Rico - Medical Sciences Campus.

RÍOS-SIERRA, NAOMI - *Assistant Professor;* MD, 2004, University of Puerto Rico - Medical Sciences Campus.

RÍOS-SOLÁ, GRISSEL - *Associate Professor;* MD, 1996, University of Puerto Rico - Medical Sciences Campus.

RIUS-ARMENDÁRIZ, ANA C. - *Professor*; MD, 1979, University of Puerto Rico - Medical Sciences Campus.

RIVERA GONZÁLEZ, MARIA DEL L. - *Assistant Professor;* MD, 1999, University of Puerto Rico -Río Piedras.

RIVERA MACMURRAY, SUZETTE- *Assistant Professor;* MD, 1985, School of Medicine Yale.

RIVERA-ACOSTA, JOSÉ E. – *Assistant Professor*; MD, 2006, University of Puerto Rico - Medical Sciences Campus.

RIVERA-BARRIOS, ÁNGEL E. – Assistant Professor; MD, 2006, University of Puerto Rico - Medical Sciences Campus.

RIVERA-BERMÚDEZ, CARLOS G. - *Associate Professor;* MD, 1973, University of Puerto Rico - Medical Sciences Campus.

RIVERA-BONILLA, ILEANA - *Professor;* MD, 1989, University of Puerto Rico - Medical Sciences Campus.

RIVERA-BOU, WANDA L. - *Assistant Professor*; MD, 1997, Universidad Autónoma de Guadalajara - México.

RIVERA-BROWN, ANITA - *Professor*; PhD, 2004, University of Puerto Rico - Medical Sciences Campus.

RIVERA-COLÓN, IRMA L. - *Assistant Professor*; EdD, 2011, University of Puerto Rico - Río Piedras Campus.

RIVERA-GONZÁLEZ, JUAN A. - *Associate Professor;* MD, 1993, University of Puerto Rico - Medical Sciences Campus.

RIVERA-GONZÁLEZ, RAÚL - *Assistant Professor*; DrPH, 2016, University of Puerto Rico - Medical Sciences Campus.

RIVERA-GUERRIOS, LOURDES – Adjunct Professor; MD, 1990, University of Puerto Rico - Medical Sciences Campus.

RIVERA-JIMÉNEZ, ENID - *Professor;* MD, 1981, University of Puerto Rico - Medical Sciences Campus.

RIVERA-LUGO, DENISE – *Assistant Professor*; MD, 1989, University of Puerto Rico - Medical Sciences Campus.

RIVERA-MARRERO, AMARILIS - *Associate Professor*; MD, 2001, Universidad Autónoma de Guadalajara – México.

RIVERA-PÉREZ, MIGUEL A. - *Professor*; PhD, 1978, University of Pittsburgh.

RIVERA-RIVERA, ANÍBAL – *Assistant Professor*, MD, 2013, University of Puerto Rico - Medical Sciences Campus.

RIVERA-RODRÍGUEZ, EZEQUIEL - *Assistant Professor;* MD, 1964, University of Puerto Rico - Medical Sciences Campus.

RIVERA-RODRÍGUEZ, NORIDZA - *Assistant Professor;* MD, 2006, University of Puerto Rico - Medical Sciences Campus.

RIVERA-ROMÁN, KEILA L. - *Assistant Professor*; MD, 2006, Ponce School of Medicine and Health Sciences - Puerto Rico.

RIVERA-SÁNCHEZ, SULAY - *Assistant Professor*; PhD, 2013, University of Puerto Rico - Medical Sciences Campus.

RIVERA-VIÑAS, JUANA I. - *Professor;* MD, 1984, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ LÓPEZ, RAFAEL – *Assistant Professor*; MD, 1982, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-ANZIANI, ISABEL M. - *Associate Professor*; MD, 1989, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-CRUZ, LETICIA - *Social Worker IV;* MA, 1990, University of Puerto Rico - Ro Piedras Campus.

RODRÍGUEZ-DE LA CRUZ, VERÓNICA - *Assistant Professor*; MD, 1978, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-GONZÁLEZ, AGUSTÍN A. - *Professor*; MD, 1986, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-GONZÁLEZ, VANESSA E. - *Professor;* MD, 1992, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-LAGUER, OLGA - *Assistant Professor*; MD, 1981, Universidad Central del Este - Dominican Republic.

RODRÍGUEZ-MALDONADO, LUIS M. - *Assistant Professor;* MD, 1996, Ponce School of Medicine and Health Sciences - Puerto Rico.

RODRÍGUEZ-MEDINA, JOSÉ R. - *Professor*; PhD, 1986, Brandeis University.

RODRÍGUEZ-MERCADO, RAFAEL - *Professor*; MD, 1988, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-MOJICA, WILMA - *Professor*; MD, 1970, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-MORALES, GILBERTO - *Associate Professor*; MD, 1975, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-NEGRÓN, REBECA - *Associate Professor*; MD, 1991, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-NIEVES, MELANIE – *Assistant Professor*; MD, 2008, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-ORENGO, JOSÉ - *Professor*; PhD, 1989, Texas A&M University.

RODRÍGUEZ-ORTIZ, PABLO - *Professor*; MD, 1983, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-PADILLA, JULIO A. - *Assistant Professor*; MD, 2001, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-PÉREZ, NOELIA – *Assistant Professor*; MD, 2005, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-QUILICHINI, SEGUNDO A. - *Associate Professor*; MD, 1989, Universidad Central del Caribe - Puerto Rico.

RODRÍGUEZ-REYES, IDIA V. - *Assistant Researcher;* DVM, 2001, Kansas State University.

RODRÍGUEZ-REYES, PATRICIA – *Assistant Professor*, MD, 2009, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-RIVERA, ZOÉ M. - *Associate Professor;* MD, 1988, University of Illinois.

RODRÍGUEZ-ROSA, RICARDO E. - *Assistant Professor*; MD, 1996, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-SERRANO, HÉCTOR J. - *Assistant Professor;* MD, 1990, San Juan Bautista School of Medicine - Puerto Rico.

ROMAGUERA-AGRAIT, JOSEFINA - *Professor;* MD, 1980, University of Puerto Rico - Medical Sciences Campus.

ROMÁN-COLÓN, MIGUEL A. – Assistant Professor; MD, 2004, University of Puerto Rico - Medical Sciences Campus.

ROMÁN-FRANCO, ÁNGEL A.- *Distinguished Professor; Professor,* MD, 1967, University of Puerto Rico - Medical Sciences Campus.

ROMÁN-GARCÍA, ANA J. – *Distinguished Professor, Professor;* MD, 1955, Faculty of Medicine, Montpellier, France.

ROMÁN-GRAU, RADAMÉS - *Assistant Professor;* MD, 1982, University of Puerto Rico - Medical Sciences Campus.

ROMERO-BASSÓ, JUAN L. - *Assistant Professor*; MD, 1983, University of Louisville.

ROSARIO-MATOS, NICOLÁS - *Adjunct Professor*; MD 2005, University of Puerto Rico - Medical Sciences Campus.

RUIZ-LÓPEZ, ROBERTO - *Assistant Professor;* MD, 1982, University of Puerto Rico - Medical Sciences Campus.

SAAVEDRA-POZO, FANOR M. - *Assistant Professor;* MD, 2003, Universidad Mayor de San Simón - Bolivia.

SAAVEDRA-POZO, MAIZA – Assistant Professor; MD, 1994, Universidad Mayor de San Simón – Bolivia

SALA MORALES, ANA C. - *Assistant Professor*; PsyD, 2010, Ponce School Medicine, Puerto Rico.

SALABARRÍA-PEÑA, IRAIDA - *Social Worker IV*; MA, 1989, University of Puerto Rico - Rio Piedras Campus.

SALGADO CRESPO, MARCOS- *Assistant Professor*; MD, 2014, University of Puerto Rico - Medical Sciences Campus.

SÁNCHEZ-GLANVILLE, CARLOS F. – Assistant Professor; MD, 2008, University of Puerto Rico - Medical Sciences Campus.

SÁNCHEZ-ORTIZ, TONYA L.- *Assistant Professor*; MD, 1999, University of Puerto Rico - Medical Sciences Campus.

SÁNCHEZ-PONT, JULIO E. - *Assistant Professor;* MD, 2000, Ponce School of Medicine and Health Sciences - Puerto Rico.

SÁNCHEZ-RIVERA, SAMUEL - *Assistant Professor*; MD, 2002, University of Puerto Rico - Medical Sciences Campus.

SÁNCHEZ-SANTIAGO, ORLANDO M. - *Associate Professor;* MD, 1989, University of Puerto Rico - Medical Sciences Campus.

SÁNCHEZ-SERGENTÓN, CARLOS G. - *Professor;* MD, 1974, University of Puerto Rico - Medical Sciences Campus.

SANTAELLA-JIMÉNEZ, ÁLVARO – *Associate Professor*; MD, 1979, Universidad de Zaragoza - Spain.

SANTANA-BAGUR, JORGE L.- *Professor;* MD, 1981, Universidad Central del Caribe - Puerto Rico.

SANTÉ-PÉREZ, MARÍA I. - *Professor*; MD, 1980, Universidad País Vasco - Spain.

SANTIAGO MOLINA, ARTEMIO S.. – *Adjunct Professor*; MD, 2013, Universidad Central del Caribe, Puerto Rico.

SANTIAGO-CABÁN, LUIS A. - *Assistant Professor*; MD, 2009, University of Puerto Rico - Medical Sciences Campus.

SANTIAGO-DELPÍN, EDUARDO A. - *Professor*; MD, 1965, University of Puerto Rico - Medical Sciences Campus.

SANTIAGO-FIGUEROA, JOSÉ M. - *Assistant Professor*; MD, 1986, University of Puerto Rico - Medical Sciences Campus.

SANTIAGO-GUZMÁN, EDGARDO L. – *Assistant Professor*; MD, 2006, Universidad Autónoma de Guadalajara, México.

SANTOS ROALES, ISAMUEL – *Adjunct Professor;* MD, 2011, Universidad Autónoma de Guadalajara, México.

SANTOS RODRIGUEZ, JINETTE- *Assistant Professor*; MD, 2008, Universidad San Juan Bautista.

SANTOS-ARROYO, AILEEN E. – *Assistant Professor*; MD, 2012, University of Puerto Rico - Medical Sciences Campus.

SANTOS-REYES, LUIS J. - *Assistant Professor;* MD, 1999, University of Puerto Rico - Medical Sciences Campus.

SANTOS-RODRÍGUEZ, RUTH A. - *Assistant Professor;* MD, 2000, Universidad Central del Caribe - Puerto Rico.

SANTOS-SANTOS, FIDEL - *Professor;* MD, 1978, University of Puerto Rico - Medical Sciences Campus.

SARIOL-CURBELO, CARLOS A. - *Researcher;* MD, 1987, Instituto de Ciencias Médicas de la Habana - Cuba.

SCALLEY-TRIFILIO, NYDIA - *Psychologist II*; MA, 1980, Centro Caribeño de Estudios Postgraduados - Puerto Rico.

SCHENK-ALDAHONDO, CHRISTIAN E. - *Assistant Professor*; MD, 2008, University of Puerto - Medical Sciences Campus.

SCHWARTZ, ABRAHAM - *Associate Professor Ad-Honorem;* PhD, 1969, Case Western University.

SCHWARZ-REITMAN, SUSANA - *Associate Professor;* MD, 1986, Universidad Central del Caribe - Puerto Rico.

SEEDS, ANDREW M. – *Joint Appointment with Institute of Neurobiology*; PhD, 2005, Duke University, North Carolina.

SEGARRA-MARRERO, ANNABELL - *Professor*; PhD, 1988, New York University, New York

SEGARRA-ROIG, LILLIAN Y. - *Associate Professor;* MD, 1989, University of Puerto Rico - Medical Sciences Campus.

SEGUNDO-DÍAZ, AURELIO - *Assistant Professor;* MD, 1984, University of Puerto Rico - Medical Sciences Campus.

SENIOR-MARINO, JOHAM - *Assistant Professor;* MD, 1982, Universidad Central del Caribe - Puerto Rico.

SEPÚLVEDA-IRIZARRY, FERNANDO L. – Assistant Professor; MD, 2010, University of Puerto Rico - Medical Sciences Campus.

SEPÚLVEDA-ORTIZ, VERÓNICA - *Assistant Professor*; MD, 2011, University of Puerto Rico - Medical Sciences Campus.

SEPÚLVEDA-RIVERA, VANESSA - *Professor;* MD, 1993, Universidad Central del Caribe - Puerto Rico.

SERRANO-BRIZUELA, ADELFA E. - *Professor;* PhD, 1987, University of Georgia.

SERRANO-RAMOS, CARMEN - *Professor;* MD, 1985, University of Puerto Rico - Medical Sciences Campus.

SERRANO-RIVERA, HORACIO - *Professor;* PhD, 2008, Universidad Autónoma de Madrid, Spain.

SERRANO-TORRES, LUIS - *Professor*; MD, 1976, University of Puerto Rico - Medical Sciences Campus.

SIERRA-MERCADO, DEMETRIO - *Associate Professor*; PhD, 2010, Ponce School of Medicine and Health Sciences - Puerto Rico.

SIFONTE-CLAUDIO, NICOLE - *Assistant Professor*; MD, 2011, University of Puerto Rico - Medical Sciences Campus.

SILÉN-RIVERA, PAMELA – *Assistant Professor;* MD, 2013, University of Puerto Rico - Medical Sciences Campus.
SILVA-DÍAZ, DÉBORA H. - *Professor;* MD, 1997, University of Puerto Rico - Medical Sciences Campus.
SILVA-HERNÁNDEZ, FRIEDA - *Professor*; MD, 1972, University of Puerto Rico - Medical Sciences Campus.
SILVA-ORTIZ, WALTER I. - *Professor;* PhD, 1986, Mount Sinai School of Medicine - New York.
SOLER-SALAS, ANTONIO H. – *Associate Professor*; MD, 1983, University of Puerto Rico - Medical Sciences Campus.
SOSA-LLORÉNS, MARÍA A. - *Professor*; PhD, 1993, University of Florida.
SOSTRE-GONZÁLEZ, WILMA - *Associate Professor*; MD, 1973, Universidad de Santiago - Madrid, Spain.
SOTO-MALAVÉ, RUTH - *Assistant Professor;* MD, 1983, Universidad Central del Este - Dominican Republic.
SOTO-SALGADO, MARIEVELISSE - *Adjunct Professor*; DrPh, 2017, University of Puerto Rico, Medical Sciences Campus
SOTO-TORRES, FERNANDO - *Assistant Professor*; MD, 2002, University of Puerto Rico - Medical Sciences Campus.
SOTO-VÉLEZ, LESLIE A. - *Assistant Professor*; MD, 2007, University of Puerto Rico - Medical Sciences Campus.
SPECHT-MAST, PHILIP C. – *Professor Ad-Honorem;* PhD, 1972, SUNY Upstate Medical University, Syracuse, New York
STOLBERG-ACOSTA, ROBERT - *Professor*; MD, 1969, University of Maryland.
SUÁREZ-DOMINGUEZ, ALBERT - *Professor*; MD, 1972, University of Puerto Rico - Medical Sciences Campus.
SUÁREZ-RIVERA, MARTA P.- *Associate Professor;* MD, 2002, University of Puerto Rico - Medical Sciences Campus.
SUAU-SANCHIDRIAN, GLORIA M. - *Associate Professor*; MD, 1998, Universidad Central del Caribe - Puerto Rico.
SUERO-LORA, JENS – *Adjunct Professor*; MD, 2013, Universidad Central del Caribe, Puerto Rico.
SURIEL-GENAO, ADALGISA DEL C. - *Assistant Professor;* MD, 1985, University of Medicine and Dentistry in New Jersey.
TABOAS-COLÓN, WILLIAM R. - *Assistant Professor;* MD, 1985, University of Puerto Rico - Medical Sciences Campus.
TIRADO-GÓMEZ, MARIBEL – *Associate Professor;* MD, 1977, University of Puerto Rico - Medical Sciences Campus.
TOMASINI-FLORES, JUAN T. - *Professor;* MD, 1972, Universidad Complutense de Madrid - Spain.
TORRES-NAVARRO, NILDA - *Associate Professor*; MD, 1986, University of Puerto Rico - Medical Sciences Campus.
TORRES-PÉREZ, HÉCTOR M. - *Professor*; MD, 1989, University of Puerto Rico - Medical Sciences Campus.
TORRES-RAMOS, CARLOS A. - *Professor*; PhD, 1996, University of Texas, Medical Branch, Galveston, Texas
TORRES-RODRÍGUEZ, ESTHER - *Professor of Internal Medicine; Joint Appointment;* MD, 1972, University of Puerto Rico - Medical Sciences Campus.
TORRES-RODRÍGUEZ, ESTHER A. - *Professor;* MD, 1972, University of Puerto Rico - Medical Sciences Campus.
TORRES-SÁNCHEZ, AURINÉS – *Assistant Professor*; EdD, 2016, University of Puerto Rico – Río Piedras Campus.
TORRES-SANTIAGO, TIMOTEO - *Assistant Professor*; MD, 1984, University of Puerto Rico - Medical Sciences Campus.
TORRES-TORRES, JUAN A. – Instructor; MD, 1967, University of Puerto Rico - Medical Sciences Campus.
TOSCA-CLAUDIO, MARÍA DE L. - *Assistant Professor;* MD, 1994, Universidad Central del Caribe - Puerto Rico.
UMPIERRE-CATINCHI, SHAREE ANN - *Professor;* MD, 1985, Harvard University.
VALCÁRCEL-MERCADO, CARMEN – Assistant Professor; MD, 1996, University of Puerto Rico - Medical Sciences Campus.
VALE-MORENO, YARI - *Assistant Professor;* MD, 1999, University of Puerto Rico - Medical Sciences Campus.
VALENTÍN-BLASINI, RICHARD - *Assistant Professor*; MD, 1997, University of Puerto Rico - Medical Sciences Campus.
VALENTÍN-CARRO, NATALIA - *Assistant Professor*; PhD, 2018, Caribbean Central University, Puerto Rico.

VALENTÍN-COLÓN, DIANA C. – *Assistant Professor; MD, 2012, Universidad Central del Caribe – Puerto Rico.*

VALENTÍN-NOGUERAS, SHEILA M. - *Associate Professor*; MD, 2005, University of Puerto Rico - Medical Sciences Campus.

VALLÉS-RAMOS, EMMA J. - *Associate Professor;* MS, 1994, University of Puerto Rico - Medical Sciences Campus.

VARGAS-OTERO, PEDRO E. – *Assistant Professor*; MD, 2009, University of Puerto Rico - Medical Sciences Campus.

VARGAS-PÉREZ, NOEL – Assistant Professor; MD, 2009, University of Puerto Rico - Medical Sciences Campus.

VÁZQUEZ-BOTET, RENÉ – *Associate Professor*; MD, 1976, University of Puerto Rico - Medical Sciences Campus.

VÁZQUEZ-CORREA, MARISEL D. - *Associate Professor;* MD, 1981, University of Puerto Rico - Medical Sciences Campus.

VÁZQUEZ-QUINTANA, ENRIQUE - Professor; MD, 1962, University of Puerto Rico - Medical Sciences Campus.

VÁZQUEZ-SELLÉS, JOSÉ R. - *Professor*; MD, 1978, University of Puerto Rico - Medical Sciences Campus.

VEGA-MARTÍNEZ, MARÍA T. - *Assistant Professor*; MD, 2004, University of Puerto Rico - Medical Sciences Campus.

VELAZQUEZ-MARRERO-GARCIA, CRISTINA M. – *Joint Appointment with Institute of Neurobiology*; PhD, 2008, University of Massachusetts Medical School.

VÉLEZ-ROSARIO, ROMÁN - *Professor*; MD, 1974, Universidad de Zaragoza - Spain.

VENDRELL-WHITNEY, ROBERTO M. - *Assistant Professor;* MD, 2001, University of Puerto Rico - Medical Sciences Campus.

VERGARA-GÓMEZ, MARK A. - *Assistant Professor;* MD, 2004, University of Puerto Rico - Medical Sciences Campus

VICENS-SALGADO, JOSÉ L. - *Assistant Professor;* MD, 1988, Universidad Central del Caribe - Puerto Rico.

VIDAL-FONT, JORGE - *Adjunct Professor*; MD, 2001, University of Puerto Rico - Medical Sciences Campus.

VIDAL-YORDÁN, CARLOS A. – *Assistant Professor*; MD, 2011, University of Puerto Rico, Medical Sciences Campus

VIERA-ORTIZ, LILIANA – Assistant Professor; MD, 2009, University of Puerto Rico - Medical Sciences Campus.

VIGO-PRIETO, JUAN A. - *Associate Professor;* MD, 1982, Universidad Católica Madre y Maestra - Dominican Republic.

VILÁ-PÉREZ, LUIS M. - *Professor;* MD, 1985, University of Puerto Rico - Medical Sciences Campus.

VILÁ-PÉREZ, SALVADOR - *Associate Professor;* MD, 1976, University of Puerto Rico - Medical Sciences Campus.

VILÁ-RAMÍREZ, RAÚL G. - *Assistant Professor*; MD, 1996, University of Puerto Rico - Medical Sciences Campus.

VILLAMIL-SÁNCHEZ, IRENE S. - *Assistant Professor*; MD 2007, University of Puerto Rico – Medical Sciences Campus.

VILLEGAS-CEIDE, VÍCTOR M. – Associate Professor; MD, 2008, University of Puerto Rico – Medical Sciences Campus.

VIQUEIRA-MARIANI, JAIME A. - *Adjunct Professor;* MD, 1974, University of Puerto Rico - Medical Sciences Campus.

VIVAS-MEJÍA, PABLO E.- *Associate Professor;* PhD, 2001, University of Puerto Rico - Rio Piedras Campus.

VIZCARRONDO-LÓPEZ, MAYRA Y. - *Professor;* MD, 1990, University of Puerto Rico - Medical Sciences Campus.

WOJNA-MUÑIZ, VALERIE - *Professor;* MD, 1984, University of Puerto Rico - Medical Sciences Campus.

WOODBURY-FARIÑA, MICHAEL A. - *Associate Professor;* MD, 1976, University of Puerto Rico - Medical Sciences Campus.

YSERN-BORRÁS, FERNANDO – *Assistant Professor*; MD, 1981, University of Puerto Rico - Medical Sciences Campus.

ZAYAS-TORRES, FERNANDO L. - *Associate Professor;* MD, 1987, University of Puerto Rico - Medical Sciences Campus.

ZEQUEIRA-DÍAZ, JORGE J. - Assistant Professor; MD, 2006, University of Puerto Rico - Medical Sciences Campus.

ZIERENBERG-PÉREZ, CHARLES E. - *Assistant Professor*; MD, 1982, University of Puerto Rico - Medical Sciences Campus.

ZORRILLA-MALDONADO, CARMEN D. - *Professor;* MD, 1978, University of Puerto Rico - Medical Sciences Campus.

SCHOOL OF DENTAL MEDICINE

HISTORY

The School of Dental Medicine of the Medical Sciences Campus was founded in 1957. It was first fully accredited by the Commission on Dental Accreditation (CODA) in 1961 and has maintained its accredited status continuously ever since. Its most recent accreditation was granted in 2020. The School prepares dentists who effectively join the profession as members of a broader health team concerned with community welfare and who are aware of their social responsibilities as educators and professionals in the community. The School is responsible for developing in its students those professional competencies related to continued personal and professional improvement. These include, among others, competencies related to communication, establishing good professional and personal interrelations, leadership and management, the application of the scientific method to problem solving, and the exercise of the highest standards of professional ethics.

Three (3) departments offer the School's academic programs: ecological, restorative, and surgical sciences. The Ecological Sciences Department stresses the study of human behavior, attitude patterns, and social phenomena in relation to the practice of dentistry. The principal frame of reference is the Puerto Rican community. The department is structured in two sections, Pediatric Dentistry-Orthodontics and Community Dentistry. It also serves as liaison with the Faculty of Biosocial Sciences and the Graduate School of Public Health. In the advanced dental education programs, the Department offers a Pediatric Dentistry and Orthodontics Residency Program.

The curriculum in the Restorative Sciences Department emphasizes the interrelationships between the biological and mechanical principles involved in the rehabilitation of oral health. The Department consists of two sections: Operative and Prosthodontics. In the advanced dental education programs, the Department offers a Prosthodontics and General Practice Residency Program.

The Surgical Sciences Department curriculum focuses on the study of concepts, principles, and procedures related to the diagnosis and treatment of diseases of bone and/or soft tissues of the oral cavity. The department is organized in four sections: Endodontics-Periodontics, Oral Surgery, Diagnostic Sciences, and Oral Biology. In the advanced dental education programs, the Department offers an Oral and Maxillofacial Surgery Residency Program.

Based on a philosophy of lifelong learning, the School also offers a Continuing Education Program for practicing dentists. The program addresses re-licensure requirements, as law in Puerto Rico establishes them.

The School also encourages the participation of its human resources and programs in community enterprises. It fosters civic spirit and pride, as well as leadership among faculty and students. Students under the direct supervision of Faculty provide dental services to the community in the clinic. Such services are commensurate with the academic needs of the students and, therefore, conform to the educational philosophy of the School. The welfare of the patient is paramount in rendering these services.

MISSION AND GOALS

The School of Dental Medicine of the UPR is a proactive institution of higher education for the formation of dentists of the highest quality, who are sensitive to the needs of their patients and are oriented to comprehensive service to the people of Puerto Rico and the global community, with a Doctor in Dental Medicine program, supplemented by various post-doctoral offerings and an innovative Continuing Education

program. The institution is a leader in research on inequalities in oral and systemic health, fostering critical thinking, intellectual curiosity, and commitment to the needs of people. Interprofessional practice, the integration of the technology in creative endeavors, and the construction of new scientific knowledge regarding the determinants of oral health are a part of a continuing, inclusive, rigorous, respectful, collaborative, and sustainable process.

In fulfilling its mission, the School of Dental Medicine pursues the following goals:

- Train general dentists with the knowledge, skills and attitudes to effectively serve the oral health needs of the population with emphasis on the Residents of Puerto Rico and the Global Community.
- Train advanced education residents/student in the field of Dental Medicine to contribute to the improvement of the oral health of the Residents of Puerto Rico and the Global Community.
- Provide services to the Residents of Puerto Rico and the Global Community geared towards oral health promotion and prevention as a component of the general health of the individual.
- Contribute to the advancement of knowledge through research in the different disciplines of dental medicine as well as dental education.
- Advance the knowledge and skills of health professionals through a sound Continuing Education Program.
- Provide an organizational environment that fosters excellence in the educational process and the fullest development of the academic community

ORGANIZATION AND ADMINISTRATION

The School of Dental Medicine is one of the six (6) schools into which the Medical Sciences Campus, of the University of Puerto Rico, has been organized. It has three (3) departments: Ecological Sciences, Restorative Sciences, and Surgical Sciences. The Dean, assisted by the Associate Dean, is responsible for the planning, development, coordination, and evaluation of the Doctor of Dental Medicine Program and Postdoctoral Programs in Pediatric Dentistry, Oral and Maxillofacial Surgery, Prosthodontics, Orthodontics, and the General Practice Residency.

The Assistant Deans in the areas of clinical instruction and student affairs are responsible for the development of strategies for the advancement of these areas, which are implemented by the departments. The Dean is also assisted by staff in the areas of curriculum, strategic planning and development, research, and continuing education.

LOCATION AND FACILITIES

The School of Dental Medicine occupies the first floor and part of the ground floor and 2nd floor of the main building of the Medical Sciences Campus, Guillermo Arbona Irizarry. The distribution of the areas is as follows:

Ground floor

- freshman and sophomore multidisciplinary laboratories along with a modern simulation laboratory
- stock and dispensing rooms
- freshmen and sophomores' locker areas
- offices of special projects and faculty
- offices of administration of postdoctoral programs
- Center for Informatics and Educational Resources (CIRE, by its acronym in Spanish)
- computing and learning centers

- office for recruitment and counseling
- students lounge

First floor

- School's majority of administrative, faculty and programs offices
- a multidisciplinary laboratory
- prosthodontics and digital dentistry laboratories for dental students
- offices and laboratories for advanced studies and dental research
- all dental clinics with waiting rooms, reception areas, and service areas
- sterilizing rooms/areas
- conference rooms
- auditorium
- students' rest area
- juniors and senior locker areas

Second Floor

- Center for Professional Development
- A224/225 classrooms

The main clinic area is equipped with 96 dental units and chairs for individual clinical training in general dental procedures. The adjacent central sterilizing room and stock dispensing room serve all clinical areas of the School and the multidisciplinary laboratories.

In addition to the main clinic area, there are special clinic areas devoted specifically to individual phases of dentistry such as oral surgery, oral diagnosis, oral radiology, and clinics for residents of the Postdoctoral Programs in Pediatric Dentistry, Orthodontics, Prosthodontics, Oral and Maxillofacial Surgery, Periodontology and the General Practice Residency.

The basic sciences multidisciplinary laboratories, the library, and the Animal Resources Center located in other areas of the Main Building are shared with other schools of the Medical Sciences Campus.

ACADEMIC PROGRAMS

DOCTOR OF DENTAL MEDICINE (DMD) PROGRAM

The program leading to the degree of Doctor of Dental Medicine (DMD) is a four-year program designed to prepare general practitioners. The curriculum is based on competencies and is organized around four (4) integrated curricular areas: Biomedical Sciences, Assessment and Diagnosis, Prevention and Treatment, Professional Development and Management of the Dental Practice. These areas are defined according to the knowledge, skills, and values necessary to achieve competencies. Biomedical Sciences includes fundamental knowledge of the development, structure, function, and mechanism of diseases of the human body. Assessment and Diagnosis comprises the knowledge, skills, and values related to the assessment of normal structures and diagnosis of the abnormalities, diseases and dysfunctions of the orofacial complex in the child, adolescent, adult, geriatric, and special patient. Prevention and Treatment includes the knowledge, skills, and values related to the prevention and treatment of abnormalities, diseases, and dysfunctions of the orofacial complex of the child, adolescent, adult, geriatric and special patient. Professional Development and Management of the Dental Practice promotes the development of the individual as a professional and his/her role in the community. It includes, among others, the concepts of practice management, ethical and legal aspects of the profession, exposure control and risk management, and human resources management.

Admission Requirements

Candidates for admission to the freshman class must present evidence of successful completion of at least two (2) full academic years of work in an United States of America (USA) accredited college or university, with a minimum grade point average of 2.50 (in a scale of 4.00) in both sciences and general courses, which must be completed by the end of the second semester of the academic year prior to admission. This work must comprise not less than 90 semester hours or 135 quarter hours including the following:

Spanish	12 semester or 18 quarter credits
English	12 semester or 18 quarter credits
Biology and Zoology	8 semester or 12 quarter credits
General Physics	8 semester or 12 quarter credits
General Chemistry	8 semester or 12 quarter credits
Organic Chemistry	8 semester or 12 quarter credits
Social and Behavioral Sciences	6 semester or 9 quarter credits

(Sociology, Psychology, Political Sciences, Economics, Anthropology or Ethics)

- All requirements specified above must be completed by the end of the second semester of the academic year prior to admission. In case of applicants who have approved Honor's Spanish or English courses, with a grade of B or above per semester, the Admission's Committee will consider, upon request, to reduce the requirements to six (6) semester credits.
- The Biology or Zoology, Physics, General and Organic Chemistry, and Social Sciences requirements must be met. These requirements are in addition to the basic courses required at some schools (ex. the University of Puerto Rico, Río Piedras Campus). Basic courses in Physical Sciences, Biological Sciences, and Social Sciences may not be substituted for the specific credits stipulated in this list.
- A general and a specific grade point average (GPA) in sciences of a least 2.50 (in a 4.0 scale), is mandatory. All requirements must be completed no later than the second semester prior to admission. At the time of application, all required courses must be approved with at least 2.00.
- All sciences courses should include both, lectures and laboratory instruction. It is advisable that students choose elective subjects that will enhance their intellectual background and provide a well-

rounded education. Biochemistry or Molecular Biology, Histology, Physiology, Anatomy, Microbiology, Genetics, Psychology, and Ethics courses are highly recommended.

- Instruction at the School of Dental Medicine may be conducted in English or Spanish. Thus, students should be fluent in speaking, reading, and writing in both languages.
- Candidates for admission to the University of Puerto Rico School of Dental Medicine are subject to evaluation on four (4) main criteria: academic performance, dental admissions test (DAT) scores, geographic area of residence, and personal attributes.

Academic Performance

Academic performance is measured through the academic grade point average obtained during pre-dental studies and the number of repeated courses, withdrawals, deficient or failing grades, as evidenced in the official transcript. A final grade of at least C (in a 4.00 scale) is mandatory in every required course.

Dental Admission Test (DAT)

The applicant must take the DAT on or before the application deadline. It is recommended that students prepare well before taking the test. The candidate must take the DAT one year prior to the application deadline so that, if necessary, he / she can repeat the exam. The Council in Dental Education requires a period of 90 days before repeating the exam. The results of the DAT are valid for three years.

Location of Residence

The School of Dental Medicine of the University of Puerto Rico was established as part of the commitment of the Commonwealth of Puerto Rico to improve and safeguard the health of its citizens. The University of Puerto Rico is a state supported institution and recognizes its responsibility in preparing personnel to meet the dental health needs of the Island. For this reason, preference is given to qualified applicants who are legal residents of Puerto Rico. Out of state residents will be considered, with special attention given to applicants who demonstrate strong ties to Puerto Rico. Foreign national applicants with an established legal residence in Puerto Rico will only be considered if, at the time of application, they are either US citizens or have been granted a permanent resident visa in the United States.

Personal Attributes

After an initial screening of the three (3) admission criteria the Admission's Committee selects applicants to be interviewed. Besides the interview, other criteria such as letters of recommendation and broadness of educational and life experiences are taken into consideration for admission. Candidates must obtain letters of recommendation from the Pre-dental Committee of the college of origin, or its equivalent, and from one of his/her college instructors.

Applications Process

The application to the School of Dental Medicine is processed through the Associated American Dental Schools Application Service (AADSAS). It must be received by AADSAS no later than December 1st of the year preceding admission. The application request card may be obtained from the Central Admission's Office of the Medical Sciences Campus or directly from:

Associated American Dental Schools
Application Service
1625 Massachusetts Avenue N.W., Suite 600

Washington, DC 20036-2212
Web site: http://portal.aadsasweb.org

The candidate must complete the General Application Form for the Medical Sciences Campus. This application form may be obtained from the Central Admission's Office of the Medical Sciences Campus and should be returned to that office no later than December 1st. In addition, the candidate must submit the following documents to the Central Admission's Office on/or before the application deadline:

- An official transcript from each institution of higher education attended.
- A recent 2" x 2" photograph.
- Two (2) letters of recommendation and/or evaluation forms as specified.
- A certified check or money order payable to the University of Puerto Rico for the amount of $30.00 to cover the non-refundable application fee.

The application form for the Dental Admissions Test may be obtained from the Central Admission's Office or directly from:

American Dental Association (ADA)
Department of Testing Services
211 East Chicago Avenue, Suite 1846
Chicago, IL 60611-2678

For further information and/or assistance write to:

University of Puerto Rico
Medical Sciences Campus
School of Dental Medicine
Medical Sciences Campus
P.O. Box 365067
San Juan, Puerto Rico 00936-5067
or call (787) 758-2525, ext. 1113, 1008, 5213, 5138

The School of Dental Medicine will send notice of admission or admission denial. Admitted students should present this notice at registration time. They must send their written acceptance of admission along with the required deposit of $100.00 and, prior to enrollment, must comply with the requirements specified in the letter of admission.

A candidate for admissions who is not accepted and decides to reapply must submit the following documents:

- A new AADSAS Application Form
- A recent official transcript from all colleges attended
- Any other documentation requested by the Central Admission´s Office

Any additional significant information for the Admissions Committee to consider should also be submitted.

Graduation Requirements

A student is eligible for graduation under the curriculum requirements in effect at the time of admission to the School of Dental Medicine. Students who do not satisfy graduation requirements within the established

period of time corresponding to their curriculum, and students who re-enroll after a period of absence, will be bound by the requirements applicable to the class with which they register.

In order to receive a degree, candidates must approve all courses and have a minimum GPA of 2.50 and have taken the Integrated National Board Dental Examination (INBDE). Students with an average of 3.30 to 3.49, graduate Cum Laude; those who achieve 3.50 to 3.99, graduate Magna Cum Laude, and those with 4.00 graduate Summa Cum Laude. In order to be eligible for graduation with honors (Cum Laude, Magna Cum Laude or Summa Cum Laude), students must have completed at least 85% of the credit hours required for graduation at the University of Puerto Rico Medical Sciences Campus.

DOCTOR OF DENTAL MEDICINE (DMD) CURRICULUM

Total Hours: 4,796

Biomedical Sciences: 767 Hours

CBIO 7100	Biochemistry	81
CBIO 7110	Gross Anatomy	135
CBIO 7120	General Histology	80
CBIO 7130	Neuroanatomy	60
CBIO 7140	Oral Histology and Embryology	40
CBIO 7150	Microbiology	84
CBIO 7160	Basic Human Physiology for Dental Medicine Students	92
CBIO 7170	General Systemic Pathology	71
CBIO 7180	Oral Pharmacology and Therapeutics	74
CBIO 7190	Integration of Biomedical Sciences into Dental Practice	50

Assessment and Diagnosis: 394 Hours

EVDI 7105	Introduction to Assessment and Diagnosis of the Patient	38
EVDI 7115	Human Development and Behavioral Management	44
EVDI 7125	Dental Anatomy and Functional Occlusion	127
EVDI 7135	Dental & Craniofacial Imaging	20
EVDI 7245	Development of the Orofacial Complex	16
EVDI 7255	Oral Pathology	35
EVDI 7265	Oral Diagnosis and Treatment Planning	57
EVDI 7266	Integration of Oral Medicine and Diagnostic Skills with Oral Pathology: Advanced Course	40
EVDI 7275	Assessment and Diagnosis of the Child and Adolescent	17

Professional Development: 278 Hours

DESP 7100	Introduction to Research in Dental Medicine	20
DESP 7117	Introduction to Professional Development I	12
DESP 7127	Introduction to Professional Development II	26
DESP 7237	Evaluation of Scientific Literature and Epidemiology	20
DESP 7247	Introduction to Community Dentistry	20
DESP 7357	Professional Development III	60
DESP 7467	Dental Practice Externship	120

Prevention and Treatment: 3,213 Hours

PRET 7106	Cariology	16
PRET 7116	Preventive Dentistry	44
PRET 7126	Introduction to Restorative Dentistry and Principles of Intracoronal Restorations	250
PRET 7136	Clinical Application on Dental Skills	54
PRET 7246	Removable Prosthodontics	253
PRET 7257	Periodontics	55
PRET 7266	Oral Surgery	30
PRET 7276	Fixed Prosthodontics	250
PRET 7277	Pediatric Dental Treatment	32
PRET 7286	Apprehension and Pain Control	22
PRET 7296	Endodontics	95
PRET 7298	Orthodontic Treatment Planning	57
PRET 7316	Dental Care for the Special Patients	28
PRET 7330	Review for the Integrated National Dental Board Examination	54
PRET 7336	Advanced Oral Surgery	20
PRET 7346	Clinical Occlusion and TemporoMandibular Dysfunction Management	20
PRET 7356	Medical Emergencies	16
PRET 7366	Implant Dentistry	12
PRET 7376	Geriatric Dentistry	12
PRET 7387	Third Year Comprehensive Care Clinic	893
PRET 7400	Comprehensive Care Clinic	1,000
PRET 7426*	Review Basic Concepts and Laboratory in Removable, Fixed, and Implant Prosthesis for International Students	54
Electives		144

* Course is only for students admitted under the Advanced Placement Program who have passed the National Board Dental Examination Part II or the INBDE, to replace the course PRET 7330.

ADVANCED DENTAL EDUCATION PROGRAMS – POSTDOCTORAL CERTIFICATES AND MASTER'S DEGREES

The Advanced Dental Education Programs are designed for the preparation of well qualified dental specialists in the oral health fields most needed by the Puerto Rican population. The collaboration with the Iberoamerican countries in the preparation of dental specialists is another responsibility that the School accepts as part of its mission.

The Advanced Dental Education programs are administered by the Office of the Assistant Dean for Graduate Dental Education. The Assistant Dean for Graduate Dental Education has been delegated, through the Associate Dean, the management of all aspects related to the evaluation of the programs, coordination of the accreditation processes, admission, promotion, and graduation processes in collaboration with the directors of the programs.

Requirements for Admission

All candidates to the Advanced Dental Education Programs must comply with the following requirements:

- A degree of Doctor of Dental Surgery (DDS) or Doctor of Dental Medicine (DMD), or equivalent from an accredited dental school.
- Official transcripts from all institutions of higher education attended and photocopies of the diplomas or certificates received. Candidates accepted should present the originals upon admission to the program.
- Must have passed the first part of the National Board Dental Examinations (NBDE) prior to beginning the program.
- A personal interview.
- Must be fluent in English and Spanish.
- A recent 2" x 2" photograph.
- A complete application should be received no later than October 1st for admission to the program beginning July 1st of the next calendar year. Applicants should submit an application through the Postdoctoral Application Support Service (PASS) program. Please obtain a PASS application by writing to the following:

  AMERICAN DENTAL EDUCATION ASSOCIATION (ADEA)
  PASS PROCESSING DEPARTMENT
  PO Box 9115
  Watertown, MA 02471
  Web Site: http//www.adea.org/passapp/

The candidate will be notified of acceptance or rejection no later than January 30th.

Applicants must have a minimum grade point average established by each program:

Program	Minimum GPA
Orthodontics	3.00
Pediatric Dentistry	3.00
Prosthodontics	2.60
Oral & Maxillofacial Surgery	3.00
Periodontology	3.00
GPR	2.50

Foreign Students

Foreign Students must comply with the following additional requirements:

- Must have their diplomas, school transcripts, and all other pertinent documents, certified as official by the Ministry of Education or similar agency in their country of origin, or by the U.S. Embassy in those countries where these services are available.
- Must have legal proof of financial support. An affidavit or sworn statement, as well as bank records are required for the processing of the Student's VISA. The University of Puerto Rico does not provide scholarships, stipends or financial aid to foreign students.
- The approval of the National Board Dental Examinations Part I and Part II is waived for foreign candidates, but it is recommended.
- Candidates must present evidence of approval of the TOEFL exam when applying to all Advanced Education Specialty Programs.
- Foreign candidates are encouraged to participate in the six months Short Professional Studies in Dentistry course prior to applying for the Advanced Dental Education Program.

For further information and/or assistance call: (787) 758-2525 ext. 1121, 2509.

Criteria for Admission

Criteria for admission to the Advanced Dental Education Specialty Programs are stated below. Each program determines the weight given to each criterion.

- Academic Performance in Pre-Dental Education
- Dental Education General Point Average
- Interview and/or letters of recommendation
- National Dental Boards Examination
- Professional Experience & Academic Activities
- Research Experience
- Extracurricular Activities

Each Program Director appoints an Admission's Committee that evaluates all completed applications and interviews those applicants who meet the requirements established by the residency program. Once applicants have been interviewed, the results are sent to the Office of the Assistant Dean for Graduate Dental Education.

The Office for the Assistant Dean for Dental Graduate Education has an Admission Committee that foresees the selection process within each academic program. This Committee is composed by: the Assistant Dean for Graduate Dental Education, the Associate Dean, dental graduate program directors or their representatives and two residents. Each program has a process and members, that review potential candidates, make interviews, and present their recommendations to the Dental Graduate Programs Admission Committee. After this process, a final admission recommendation is presented to the Dean.

General Requirements

All Advanced Dental Education Program students must attend the program on a full-time basis. The Advanced Dental Education Specialty Programs, as well as the length of the curriculum, and the maximum number of years for completion of each degree is as follows:

Program	Length of Curriculum *(In years)*	Maximum Time Allowed for the Completion of the Degree
Post D.M.D. Certificates		
General Dentistry	1	1.5
General Dentistry (optional 2nd year)	1	1.5
Oral & Maxillofacial Surgery	4	6
Prosthodontics	3	4.5
Pediatric Dentistry	2	3
Orthodontics	3	4.5
Master of Science in Dentistry (M.S.D.)		
Oral & Maxillofacial Surgery	5	6
Prosthodontics	4	5.5
Pediatric Dentistry	3	4
Orthodontics	3	4.5

Program	Length of Curriculum *(In years)*	Maximum Time Allowed for the Completion of the Degree
Periodontology	3	4.5

Graduation Requirements

Residents must satisfactorily pass all required courses and have a minimum grade point average of 3.00, as certified by the Registrar's Office. Residents must also comply with the Rules and Regulations of the University of Puerto Rico (UPR) School of Dental Medicine (SDM), the didactic and clinical training sites, and the Resident´s Contractual Agreement signed prior to enrollment.

POSTDOCTORAL CERTIFICATE IN GENERAL DENTISTRY (GPR-FIRST YEAR PROGRAM)

The General Practice Residency (GPR) program of the University of Puerto Rico (UPR), School of Dental Medicine (SDM), is a fully accredited residency-training program sponsored by the SDM, Medical Sciences Campus (MSC.), and affiliated to the University District Hospital (UDH) in San Juan and the Hospital of the UPR in the municipality of Carolina. Ample experience is provided in the hospital setting, enabling the graduates to work more efficiently as an integral part of the institutional health team. In addition, students practice at the Diabetes Clinic at the MSC, at the UDH, at the Smile for the Mountain Community Program, at *Centro de Salud Oral Materno Infantil* (CSOMI), and at the Puerto Rico Community Network for Clinical Research on AIDS (PR CoNCRA), an agency dedicated to providing care for HIV/AIDS patients. This program has been training residents in postdoctoral certificate in general dentistry and delivering comprehensive dental care since July 1988.

The GPR program is designed to provide advanced training in clinical dentistry and applied basic and medical sciences, and to refine the skills necessary for the generalist to provide comprehensive patient care with a high level of competency for all population groups. It prepares the residents to manage total oral health by providing instruction and experience in the delivery of care to a wide range of ambulatory and hospitalized patients.

The GPR training is provided primarily in the context of patient care, in which most of the resident's time is devoted to directing delivery of oral health care. The program consists of 12 consecutive months of both core and elective components. Clinical work is supplemented by formal educational activities, to assure that students achieve program goals and objectives, and derive maximum educational value from clinical experiences. Students must approve all courses in the study program in order to qualify for certification.

The program's three major components are: academic, hospital rotations, and dental services. These include:

Academic

Lectures	4 hours/week
Seminars	1 hour/week
Journal club	1 hour/week
Case presentations and discussions	1 hour/week
Physical Diagnosis Course	3 hours/week/1st trimester

Hospital Rotations

Emergency Medicine	2 weeks
Anesthesiology	2 weeks

Internal Medicine	2 weeks
Oral and Maxillofacial Surgery	2 weeks
Emergency Service	Approximately 5 days per month

Dental Services

Hospital Dental Clinics	4 days per week throughout the year for outpatient and inpatient care
Consultations	1 hour/week, or as required in emergency cases.

Graduation Requirements

Residents must satisfactory pass all required courses and have a minimum grade point average of 3.00, as certified by the Registrar's Office.

POSTDOCTORAL CERTIFICATE IN GENERAL DENTISTRY (GPR-FIRST YEAR PROGRAM) CURRICULUM

Total Credit Hours: 33 Semester C.H. + 10 Trimester C.H.

PHAR 8515	Pharmacology and Therapeutics	2
PROG 9100	Anesthesiology Rotation	4
PROG 9101	Patient Care Clinic I	2
PROG 9102	Patient Care Clinic II	2
PROG 9105	Oral and Maxillofacial Surgery Clinic	2
PROG 9106	Hospital Protocol	2 tr
PROG 9107	Conscious Sedation for Dental Patients	3 tr
PROG 9108	Physical Diagnosis	3 tr
PROG 9111	Comprehensive Patient Care Clinic I	2
PROG 9112	Comprehensive Patient Care Clinic II	2
PROG 9113	Clinical Sciences Seminar I	2
PROG 9114	Clinical Sciences Seminar II	2
PROG 9115	Internal Medicine Rotation	0 tr
PROG 9116	Emergency Rotation	0
PROG 9117	Gerodontology	2 tr
PROG 9121	Dental Literature Review I	2
PROG 9122	Dental Literature Review II	2
PROG 9135	Implant Dentistry for General Practice Residents	3
PROG 9145	New Endodonthic Techniques	3
PROG 9155	Oral Health and HIV	3

Professional Studies in Dentistry (GPR)

Besides the first year in Advanced Dental Education Program in General Practice Residency (GPR), the SDM offers a six–month to a year special program, which is not conducive to a degree or diploma. Students receive a certificate of the program. This program is designed for foreign dentists interested in the regular advanced dental education program.

PROG 9515 – (Section 005) – Professional Studies in Dentistry – 0 crs.

POSTDOCTORAL CERTIFICATE IN GENERAL DENTISTRY (GPR-SECOND OPTIONAL YEAR PROGRAM)

The University of Puerto Rico, School of Dental Medicine offers, to interested first year residents, the opportunity to continue studies leading to a General Practice Residency Program Certificate – Second Year. This second year has been designed to provide the residents with the opportunity to design his/her clinical sessions and acquire experience in areas of their own interest. In addition, didactic and clinical courses are offered to confer a level of proficiency in those skills acquired during their previous years of studies.

Didactic and clinical experiences are also provided in practice administration, research, and teaching. Students are required to write a research proposal before graduation and to assume supervisory responsibilities with senior students and first year GPR residents. The academic year will consist of 52 weeks (July 1st to June 30th).

Admission Requirements

All candidates to the Advanced Dental Education Programs must hold a Postdoctoral Certificate in General Dentistry granted by an accredited institution.

Graduation Requirements

Residents must satisfactorily pass all required courses and have a minimum grade point average of 3.00, as certified by the Registrar's Office.

POSTDOCTORAL CERTIFICATE IN GENERAL DENTISTRY CURRICULUM
(GPR-SECOND OPTIONAL YEAR PROGRAM)

Total Credit-Hours: 21 Semester C.H. + 11 Trimester C.H.

EDSU 6501	Systematic Planning of Instruction	3 tr
or		
EDSU 6503	Principles of Curriculum Design and Developing	3 tr
PDOC 9006	Research Methods and Applied Statistics for Dental Residents	5 tr
PROG 9136	Advanced Implant Dentistry for General Practice Residents	3
PROG 9146	Advanced Endodontic Techniques	3
PROG 9151	General Patient Care Clinic I	2
PROG 9152	General Patient Care Clinic II	2
PROG 9156	Advanced Oral Health and HIV	3
PROG 9161	Advanced Concepts in Clinical Sciences I	2
PROG 9162	Advanced Concepts in Clinical Sciences II	2
PROG 9175	Clinical Elective for Second Year Residents	0
PROG 9185	Clinical Supervision Rotation	2
PROG 9186	Administration of Oral Health Services	3 tr
PROG 9187	Journal Club	2

POSTDOCTORAL CERTIFICATE IN ORAL AND MAXILLOFACIAL SURGERY

The Postdoctoral Certificate in Oral and Maxillofacial Surgery Program was established in July, 1963. The program consists of a minimum of four (4) consecutive years (48 months) of progressive educational experiences leading to a Postdoctoral Certificate in Oral and Maxillofacial Surgery. The program also offers the opportunity to obtain a Master of Science in Dentistry (MSD) degree with the completion of additional

academic requirements. It meets the accreditation requirements of the Commission on Dental Accreditation (CODA) of the American Dental Association (ADA) and the requirements for examination and certification by the American Board of Oral and Maxillofacial Surgery. The program uses the facilities and resources of the School of Dental Medicine, the University District Hospital, the Pediatric University Hospital, and the *Administración de Servicios Médicos (ASEM) de Puerto Rico* facilities. Three (3) residents are accepted every year. Interested candidates must submit an application through the Postdoctoral Application Support Service (WebAdmit for American Dental Education Association PASS).

The first year of the program exposes residents to fundamental knowledge related to the evaluation of patients in the hospital environment. During this year the resident is On–call duty every third night at the emergency room, will work with medically compromised patients at the out-patient clinic, takes a Physical Diagnosis course with second year medical students, presents seminars, literature reviews, case presentations, and takes an advanced basic sciences course that provides basic knowledge and skills for oral and maxillofacial surgery diagnosis and treatment. Residents are also introduced to basic research concepts, biostatistics, and scientific methodology so that they may apply them in future situations along their professional lives.

The second year consists of rotations in the medical departments of Anesthesiology (5 months), Internal Medicine (2 months), and elective surgical rotations from which Oto-Head and Neck Surgery or neurosurgery can be chosen among other programs (2 months). During the second year, residents also participate in the outpatient clinic, in seminars, literature reviews, and case presentation courses.

The third year includes rotations in General Surgery (4 months). On the third year, residents work towards the mastery of basic oral and maxillofacial surgery principles, evaluation of the medically compromised patient, treatment of complicated odontectomies, periodontal surgery, dental implants, benign tumors of the oral cavity, fractures of the facial skeleton, debridement, and suturing of oral and facial lacerations in addition to mastering intravenous sedation techniques.

The fourth year seeks to refine surgical techniques. Residents are expected to treat conditions such as congenital and acquired anomalies of the mouth and face, develop expertise in reconstructive procedures of the maxillofacial area, understand and apply the principles of bone grafting, skin transplantation, and the use of alloplastic implants, as well as evaluation and treatment of facial plastic surgical procedures (cosmetic surgery). Each resident must complete a significant publishable research project on a clinical subject related to oral and maxillofacial surgery.

All courses must be approved in order to obtain certification. For detailed information regarding available courses and/or rotations, contact the School of Dental Medicine.

Graduation Requirements

Residents must pass all required courses satisfactorily and have a minimum grade point average of 3.00, as certified by the Registrar's Office.

POSTDOCTORAL CERTIFICATE IN ORAL AND MAXILLOFACIAL SURGERY CURRICULUM

Total Credit Hours: 74 Semester C.H. + 5 Trimester C.H.

BIOR 9005	Advanced Oral Biology Core Course	5
CIOM 9460	General Anesthesia Rotation	3
CIOM 9511	Seminars, Review of Literature Case Presentations I	4

CIOM 9512	Seminars, Review of Literature Case Presentations II	4
CIOM 9521	Seminars, Review of Literature Case Presentations III	4
CIOM 9522	Seminars, Review of Literature Case Presentations IV	4
CIOM 9531	Seminars, Review of Literature Case Presentations V	4
CIOM 9532	Seminars, Review of Literature Case Presentations VI	4
CIOM 9541	Seminars, Review of Literature Case Presentations VII	4
CIOM 9542	Seminars, Review of Literature Case Presentations VIII	4
CIOM 9611	Hospital Procedures I	2
CIOM 9612	Hospital Procedures II	2
CIOM 9621	Hospital Procedures III	2
CIOM 9622	Hospital Procedures IV	2
CIOM 9631	Hospital Procedures V	2
CIOM 9632	Hospital Procedures VI	2
CIOM 9641	Hospital Procedures VII	2
CIOM 9642	Hospital Procedures VIII	2
CIOM 9731	Cosmetic and Reconstructive Surgery of the Maxillofacial Region I	2
CIOM 9741	Cosmetic and Reconstructive Surgery of the Maxillofacial Region II	2
CIOM 9742	Cosmetic and Reconstructive Surgery of the Maxillofacial Region III	2
CIOM 9830	Theory and Practice of Deep Sedation-General Anesthesia	3
CIOM 9847	Research Completion Project	6
MEDI 9300	Physical Diagnosis	3
PDOC 9006	Research Methods and Applied Statistics for Dental Residents	5 tr

The following additional courses are also required for certification:

- Advanced Cardiac Life Support (ACLS)
- Advanced Trauma Life Support (ATLS)
- Pediatric Advanced Life Support (PALS)

Required Rotations 12 Month Total	**Months**
Neurosurgery/ENT	2
General Surgery	4
General Anesthesia	5
Medicine	2

Requirements to fulfill master's degree:

PDOC 9000	Thesis	8
PDOC 9101	Introduction to Research Planning	2 tr
PDOC 9102	Research Planning and Statistical Design	3

Professional Studies in Dentistry (Oral and Maxillofacial Surgery)
Special Six–Month to a Year Program

Besides the four year Advanced Dental Education Specialty Program in Oral and Maxillofacial Surgery, the School of Dental Medicine offers a six–month to a year special program, which is not conducive to a degree or diploma. Students receive a certificate of the program. This program is designed for foreign dentists interested in the regular advanced dental education program and provides the basic didactic and clinical

experiences related to the latest concepts, diagnostic methods, modalities of treatment, and surgical techniques in the field of Oral and Maxillofacial Surgery.

PROG 9515 – (Section 001) – Professional Studies in Dentistry – 0 crs.

POSTDOCTORAL CERTIFICATE IN PROSTHODONTICS

The Postdoctoral Certificate in Prosthodontics Program was established in October, 1990. The program consists of a minimum of three consecutive years (36 months) of progressive educational experiences leading to a Postdoctoral Certificate in Prosthodontics. The program also offers the opportunity to obtain a Master of Science in Dentistry (MSD) degree, with the completion of additional academic requirements. It meets the accreditation requirements of the Commission on Dental Accreditation (CODA) of the American Dental Association (ADA) and the prerequisites for examination and certification by the American Board of Prosthodontics. The program uses the resources of the University of Puerto Rico (UPR), School of Dental Medicine (SDM), and is affiliated to the University District Hospital (UDH).

The first year provides students the fundamental knowledge related to the treatment of prosthodontic patients. Residents work with healthy and medically compromised patients and participate in seminars, treatment planning boards, lectures, laboratory experiences, and formal courses in pathology, statistics, research protocols, pharmacology, and gerontology.

Most of the second year of the program, is devoted to clinical experiences in the areas of fixed, removable, and maxillofacial prosthodontics, temporomandibular joint related disorders, and prosthetic reconstruction with dental implants. The third year of the program focuses on clinical experiences, teaching, and the completion of a research project.

Other program activities include clinical instruction, lecturing to undergraduate students, journal club, cleft palate, and lip team conferences, basic cardiac life support courses, continuing dental education courses, and presentation of a table clinic at the annual meeting of the College of Dental Surgeons of Puerto Rico. Strong emphasis is given to research experiences and a research project and a paper for publication are also required, prior to graduation.

Graduation Requirements

The resident must pass all courses satisfactorily and have a minimum grade point average of 3.00, as certified by the Registrar's Office.

POSTDOCTORAL CERTIFICATE IN PROSTHODONTICS CURRICULUM

Total Credit Hours: 129 Semester C.H. + 9 Trimester C.H.

BIOR 9005	Advanced Oral Biology Core Course	5
PDOC 9006	Research Methods and Applied Statistics for Dental Residents	5 tr
PDOC 9101	Introduction to Research Planning	2 tr
PDOC 9103	Research Project I	2
PDOC 9104	Research Project II	2
PROG 9117	Gerodontology	2 tr
REST 9001	Complete Dentures Seminar I	2
REST 9002	Complete Dentures Seminar II	2
REST 9003	Complete Dentures Seminar III	2

REST 9004	Complete Dentures Seminar IV	2
REST 9011	Removable Partial Dentures Seminar I	2
REST 9012	Removable Partial Dentures Seminar II	2
REST 9013	Removable Partial Dentures Seminar III	2
REST 9014	Removable Partial Dentures Seminar IV	2
REST 9021	Fixed Partial Dentures Seminar I	2
REST 9022	Fixed Partial Dentures Seminar II	2
REST 9023	Fixed Partial Dentures Seminar III	2
REST 9024	Fixed Partial Dentures Seminar IV	2
REST 9031	Maxillofacial Prosthetics Seminar I	2
REST 9032	Maxillofacial Prosthetics Seminar II	2
REST 9033	Maxillofacial Prosthetics Seminar III	2
REST 9034	Maxillofacial Prosthetics Seminar IV	2
REST 9041	Biomedical Sciences Seminar I	2
REST 9042	Biomedical Sciences Seminar II	2
REST 9043	Biomedical Sciences Seminar III	2
REST 9044	Biomedical Sciences Seminar IV	2
REST 9051	Dental Implants I	2
REST 9052	Dental Implants II	2
REST 9071	Postgraduate Prosthodontics Clinic I	9
REST 9072	Postgraduate Prosthodontics Clinic II	9
REST 9073	Postgraduate Prosthodontics Clinic III	9
REST 9074	Postgraduate Prosthodontics Clinic IV	9
REST 9075	Postgraduate Prosthodontics Clinic V	9
REST 9076	Postgraduate Prosthodontics Clinic VI	9
REST 9081	Occlusion Seminar I	2
REST 9082	Occlusion Seminar II	2
REST 9083	Occlusion Seminar III	2
REST 9084	Occlusion Seminar IV	2
REST 9095	Introduction to Prosthodontics Laboratory	2
REST 9101	Treatment Planning and Therapy Seminar I	2
REST 9102	Treatment Planning and Therapy Seminar II	2
REST 9103	Treatment Planning and Therapy Seminar III	2
REST 9104	Treatment Planning and Therapy Seminar IV	2
REST 9105	Treatment Planning and Therapy Seminar V	2
REST 9106	Treatment Planning and Therapy Seminar VI	2

Requirements to fulfill master´s degree:

PDOC 9000	Thesis	8
PDOC 9102	Research Planning and Statistical Design	3

Professional Studies in Dentistry (Prosthodontics)
Special Six–Month to a Year Program

Besides the three (3) year Advanced Dental Education Specialty Program in Prosthodontics, the SDM offers a six–month to a year special program, which is not conducive to a degree or diploma. Students receive a certificate of the program. This program is designed for foreign dentists interested in the regular advanced dental education program.

PROG 9515 – (Section 004) – Professional Studies in Dentistry – 0 crs.

POSTDOCTORAL CERTIFICATE IN PEDIATRIC DENTISTRY

The Advanced Dental Education Specialty Program in Pediatric Dentistry Program was established in July 1st, 1969. The program consists of two (2) consecutive full-time years (24 months), of progressive educational experiences, beginning July 1st through June 30th. The Advanced Dental Education Specialty Program in Pediatric Dentistry may lead to a master's degree if candidates fulfill additional requirements, which entails one (1) additional year of study, for a minimum of three (3) consecutive years (36 months). It meets the accreditation requirements of the Commission on Dental Accreditation (CODA) and the requirements for examination and certification by the American Board of Pediatric Dentistry.

Instruction and clinical practice are conducted at the School of Dental Medicine, the Pediatric and Municipal Hospitals, off-campus community rotations in the towns of Cidra and San Juan, through satellite centers in Santurce and San Gabriel School for the Deaf. Formal courses of instruction are provided in related subjects by means of seminars, lectures, discussions, oral and written reports, examinations, and practical exercises. Admission to the program is open to qualified graduates of dental schools accredited by the Commission on Dental Accreditation and, to graduates of foreign dental schools who intend to return to their countries of origin as teachers and/or researchers. Students enrolled in the program are required to participate full-time and are strongly discouraged from engaging in private practice while in the program.

The program is designed to prepare specialists to cope with the oral health problems of children and adolescents. The educational experiences are aimed at expanding competency in the areas of behavior management, treatment of special health needs children, preventive and interceptive treatment of malocclusion, dental practice in the hospital setting, conscious sedation, general anesthesia, biostatistics, clinically applied basic sciences, dental education, and application of modern concepts of prevention, and comprehensive dental treatment. Required clinical experiences include advanced pediatric dentistry clinic, special pediatric dentistry clinic, physical diagnosis and interceptive orthodontics. Residents spend one (1) month at the pediatric anesthesia, and one (1) month at pediatric emergency wards. While in the program, residents participate in the meeting of the cleft-palate team at the Pediatric University Hospital. Experience in the operating room and in conscious sedation are also required. Community off-campus extramural experiences include Pediatric Dentistry Clinic, HealthproMed in Santurce and Cossma clinic in the town of Cidra. Both off-campus community clinics run parallel to the regular program and emphasize oral health promotion and prevention, as well as restorative treatment.

The Advanced Dental Education Specialty Program in Pediatric Dentistry has created the Center for Maternal and Infant Oral Health (CSOMI). The center provides services within the infrastructure of the program. Unique in the Caribbean, CSOMI provides services to the mother–infant dyad. Services include preventive, restorative, and surgical interventions and frenectomies for those who have ankyloglossia that prevents adequate breastfeeding.

The structure and content of the Advanced Dental Education Specialty Program in Pediatric Dentistry follows the guidelines for advanced education programs established by the Commission on Dental Education and the American Board of Pediatric Dentistry. The program is subject to review by these groups so that graduates may receive the corresponding privileges. The Advanced Dental Education Specialty Program in Pediatric Dentistry is guided by three (3) fundamental responsibilities of the University, which are: (a) the expansion of knowledge through research, (b) the dissemination of such knowledge through teaching, and (c) the application of resources to the solution of social problems and needs. Patients are selected to provide students with a variety of clinical experiences in the areas of interceptive orthodontics, growth and

development, syndromes, developmental defects and genetic abnormalities, as well as social and behavior management problems.

The outstanding strengths of the program are:

- The availability and variety of a pool of medically compromised children with dental problems in both school and hospital clinics.
- The availability and extensive use of medical consultation during treatment of these children.
- The comprehensive treatment of malocclusion through orthodontic therapy.
- The program faculty is composed of nine (9) Board Certified Pediatric Dentists.

This program consists of two (2) continuous full-time years of academic experience, beginning July 1st, through June 30th, leading to a Postdoctoral Certificate in Pediatric Dentistry. The program also offers the opportunity to obtain a Master of Science in Dentistry (MSD) degree, with the completion of additional academic requirements. Instruction and clinical practice are conducted at the School of Dental Medicine (SDM) and the Pediatric University Hospital. Formal courses of instruction are provided in related subjects by means of seminars, lectures, discussions, and practical exercises.

The varied backgrounds of the program's full time, clinical, science and basic science faculty make it possible for the dentist seeking advanced Pediatric Dentistry training to obtain a broad-based education.

Graduation Requirements

Residents must pass all required courses satisfactorily and have a minimum grade point average of 3.00, as certified by the Registrar's Office. In addition, students must successfully complete the written examination of the American Board of Pediatric Dentistry (ABPD).

POSTDOCTORAL CERTIFICATE IN PEDIATRIC DENTISTRY CURRICULUM

TOTAL CREDIT HOURS: 42 TRIMESTER C.H. + 14 SEMESTER C.H.

BIOR 9005	Advanced Oral Biology Core Course	5 sem
MEDI 7400	Pediatrics	2 sem
PEDO 9400	Advanced Pediatric Dentistry Seminar	2
PEDO 9404	Interceptive Orthodontics Seminar	2
PEDO 9407	Anesthesiology Clerkship	2
PEDO 9408	Advanced Pediatric Dentistry Clinic	3
PEDO 9409	Advanced Pediatric Dentistry Clinic	3
PEDO 9411	Special Pediatric Dentistry Clinic	2
PEDO 9412	Special Pediatric Dentistry Clinic	3
PEDO 9414	Children with Special Health Care Needs	4
PEDO 9416	Dental Education	2
PEDO 9422	Interceptive Orthodontic Clinic I	1
PEDO 9423	Interceptive Orthodontic Clinic II	1
PEDO 9424	Interceptive Orthodontics Clinic	2
PEDO 9428	Evidence Based Pediatric Dentistry	2
PEDO 9439	Pediatric Physical Diagnosis	3 sem
PEDO 9447	Community Oral Health	3
PEDO 9449	Pediatric Medicine Rotation	0
PDOC 9006	Research Methods and Applied Statistics for Dental Residents	5

PDOC 9101	Introduction to Research Planning	2
PDOC 9103	Research Project I	2 sem
PDOC 9104	Research Project II	2 sem
PROG 9107	Conscious Sedation for Dental Patients	3

Requirements to fulfill master's degree:

PDOC 9000	Thesis	8 sem
PDOC 9102	Research Planning and Statistical Design	3 sem

Professional Studies in Dentistry (Pediatric Dentistry)
Special Six–Month to a Year Program

Besides the two (2) year Advanced Dental Education Specialty Program in Prosthodontics, the SDM offers a six–month to a year special program, which is not conducive to a degree or diploma. Students receive a certificate of the program. This program is designed for foreign dentists interested in the regular advanced dental education program.

PROG 9515 – (Section 003) – Professional Studies in Dentistry – 0 crs.

POSTDOCTORAL CERTIFICATE IN ORTHODONTICS

The Advanced Dental Education Specialty Program in Orthodontics was established in July, 1997. The program consists of three (3) continuous full-time years (36 months) of academic experience designed to prepare qualified dentists for specialized practice in Orthodontics. The program meets the requirements of the Commission on Dental Accreditation (CODA) of the American Dental Association (ADA) and the requirements for examination and certification of the American Board of Orthodontics. It uses the resources of the University of Puerto Rico School of Dental Medicine and is affiliated to the University District Hospital.

The program consists of a series of didactic, clinical, and research activities, specifically designed to allow the resident to achieve the competencies necessary to excel in the field of Orthodontics. The program includes, in its teaching scope, traditional training in Orthodontics and new treatment modalities such as: treatment of severe craniofacial anomalies, surgical orthodontics, including distraction osteogenesis, adult and pre-prosthetic orthodontics, including the use of temporary anchorage devices, pre-surgical orthopedics for cleft lip and palate, functional appliance therapy, temporomandibular joint disorders therapy, and clear aligners. Upon completion of the program requirements, a Master's Degree in Dental Science and a Certificate in Orthodontics will be conferred. In those cases, in which the student has fulfilled all requirements except the approval of the thesis, only a Postdoctoral Certificate in Orthodontics will be granted.

Graduation Requirements

Residents must pass all required courses satisfactorily and have a minimum grade point average of 3.00, as certified by the Registrar's Office.

POSTDOCTORAL CERTIFICATE IN ORTHODONTICS CURRICULUM

TOTAL CREDIT-HOURS: 110 SEMESTER C.H. + 7 TRIMESTER C.H.

BIOR 9005	Advanced Oral Biology Core Course	5

ORTO 9101	Orthodontic Literature Review I	1
ORTO 9102	Post Graduate Orthodontic Laboratory I	3
ORTO 9103	Orthodontic Post Graduate Clinic I	8
ORTO 9104	Craniofacial Growth and Development	2
ORTO 9105	Orthodontic Diagnosis and Treatment Planning I	10
ORTO 9106	Principles of Biomechanics in Orthodontics	1
ORTO 9107	Case Presentation Seminar I	2
ORTO 9201	Orthodontic Literature Review II	2
ORTO 9202	Post Graduate Orthodontic Laboratory II	2
ORTO 9203	Orthodontic Post Graduate Clinic II	8
ORTO 9205	Orthodontic Diagnosis and Treatment Planning II	2
ORTO 9206	Orthodontic Dental Materials	1
ORTO 9207	Case Presentation Seminar II	2
ORTO 9208	Orthodontics Interdisciplinary Seminar I	2
ORTO 9301	Orthodontic Literature Review III	2
ORTO 9303	Orthodontic Post Graduate Clinic III	8
ORTO 9304	Craniofacial Anomalies Seminar I	2
ORTO 9307	Case Presentation Seminar III	2
ORTO 9308	Orthodontic Interdisciplinary Seminar II	2
ORTO 9401	Orthodontic Literature Review IV	2
ORTO 9403	Orthodontic Post Graduate Clinic IV	8
ORTO 9404	Craniofacial Anomalies Seminar II	2
ORTO 9407	Case Presentation Seminar IV	2
ORTO 9408	Orthodontic Interdisciplinary Seminar III	2
ORTO 9501	Orthodontic Literature Review V	2
ORTO 9503	Orthodontic Post Graduate Clinic V	8
ORTO 9507	Case Presentation Seminar V	2
ORTO 9508	Orthodontic Interdisciplinary Seminar IV	2
ORTO 9601	Orthodontic Literature Review VI	2
ORTO 9603	Post Graduate Orthodontic Clinic VI	8
PDOC 9006	Research Methods and Applied Statistics for Dental Residents	5 tr
PDOC 9101	Introduction to Research Planning	2 tr
PDOC 9102	Research Planning and Statistical Design	3

Required to fulfill master's degree:

PDOC 9000	Thesis	8

Professional Studies in Dentistry (Orthodontics)
Special Six–Month to a Year Program

Besides the three (3) years in the Advanced Dental Education Specialty Program in Orthodontics, the SDM offers a six–month to a year special program, which is not conducive to a degree or diploma. Students receive a certificate of the program. This program is designed for foreign dentists interested in the regular advanced dental education program.

PROG 9515 – (Section 002) – Professional Studies in Dentistry – 0 crs.

MASTER IN SCIENCESS OF DENTISTRY IN PERIODONTOLOGY

The Master in Sciences of Dentistry in Periodontology is directed toward providing opportunities for the development of well-trained periodontists competent in providing broad spectrum periodontal care with comprehensive background clinical experience, current basic science knowledge relevant to periodontics, and an understanding of research methodology. This is a three academic years or a minimum of thirty-six months educational experiences. The program focuses on the advanced study of the etiology and treatment of diseases of the gingivae (gum tissue) and supporting bone, nerve, and vascular structures. Includes instruction in periodontium pathology, diagnostic procedures and equipment, occlusion, nutritional aspects of periodontology, surgical treatments, and patient care and management. The Program meets the accreditation requirements of the Commission on Dental Accreditation (CODA) of the American Dental Association (ADA) and the prerequisites for examination and certification by the American Board of Periodontology.

The curricular component includes 100 credit hours distributed throughout the three years, focusing on Biomedical, Clinical, and Research Sciences. A thorough knowledge of periodontal literature, both classic and current, will be stressed. A variety of courses with topics in surgical anatomy, bone and connective tissue biology, oral pathology, histopathology, and technological assessment will prepare the students to render efficient and comprehensive dental care. Interdisciplinary seminars will promote collaboration with other specialties in patient assessment and management. Every student will perform and complete a research project under the supervision of a mentor and advisory committee. The research area can range from basic science projects to human clinical trials. Other program activities include clinical instruction, lecturing to undergraduate students, journal club, basic cardiac life support courses, continuing dental education courses, and presentation of a table clinic at the annual meeting of the College of Dental Surgeons of Puerto Rico.

Graduation Requirements

In addition to complying with the general graduation requirements for the advanced dental education programs, students must approve all courses with B or higher, submit a manuscript for publication, and approve the in-service examination of the American Academy of Periodontology.

MASTER IN SCIENCESS OF DENTISTRY IN PERIODONTOLOGY CURRICULUM

TOTAL CREDITS: 100

First Year

Codification	Course Title	Credit Hours	Clock Hours
Biomedical Sciences: 21 credits			
PHAR 8515	Advanced Pharmacology and Therapeutics	2	24
BIOR 9005	Advanced Oral Biology Core Course	5	154
PERI 9100	Oral Medicine, Oral Pathology and Diagnostic Skills	2	36
PROG 9106	Hospital Protocol	2	36
PERI 9101	Classic Periodontal Literature Seminar I	2	36
PERI 9104	Current Periodontal Literature Seminar I	2	36
PROG 9108	Physical Diagnosis	3	33
PROG 9107	Conscious Sedation for the Dental Patient	3	36
Clinical Sciences: 19 credits			
PERI 9120	Periodontal Diagnosis & Treatment Planning I	2	36
PERI 9121	Periodontal Lecture Series I	2	36

PERI 9125	Implant Dentistry for the Periodontist I	2	36
PERI 9126	Periodontal Surgery	1	18
PERI 9127	Graduate Periodontal Clinic I	8	864
PROG 9100	Anesthesiology Rotation	4	40
Research Sciences: 7 credits			
PDOC 9101	Introduction to Research Planning	2	36
PDOC 9006	Research Methods and Applied Statistics for Dental Residents	5	36
	TOTAL	**47**	

Second Year

Codification	Course Title	Credit Hours	Clock Hours
Biomedical Sciences: 5 credits			
PERI 9202	Classic Periodontal Literature Seminar II	2	36
PERI 9205	Current Periodontal Literature Seminar II	2	36
PERI 9230	Occlusion	1	12
Clinical Sciences: 17 credits			
PERI 9222	Periodontal Lecture Series II	3	54
PERI 9226	Implant Dentistry for the Periodontist II	2	36
PERI 9228	Graduate Periodontal Clinic II	10	1008
PERI 9221	Periodontal Diagnosis & Treatment Planning II	2	36
Research Sciences: 11 credits			
PDOC 9102	Research Planning and Statistical Design	3	
PDOC 9000	Thesis	8	144
	TOTAL	**33**	

Third Year

Codification	Course Title	Credit Hours	Clock Hours
Biomedical Sciences: 4 credits			
PERI 9303	Classic Periodontal Literature Seminar III	2	36
PERI 9306	Current Periodontal Literature Seminar III	2	36
Clinical Sciences: 17 credits			
PERI 9323	Periodontal Lecture Series III	2	36
PERI 9327	Implant Dentistry for the Periodontist III	2	36
PERI 9340	Clinical Supervision Rotation	1	9
PERI 9322	Periodontal Diagnosis and Treatment Planning III	2	36
PERI 9329	Graduate Periodontal Clinic III	10	1296
Research Sciences: 0 credits			
PDOC 9000	Thesis	0	
	TOTAL	**22**	

Application

Application to Professional Studies in Dentistry is conducted through the Office of the Assistant Dean for Graduate Dental Education. An interview with the Director of the Advanced Dental Education Specialty Program of interest is mandatory in order to start the application process.
http://dental.rcm.upr.edu/wp-content/uploads/sites/5/2015/10/Professional-Studies-Aplication-Form.pdf

COURSE DESCRIPTIONS

First Professional Level: Doctor of Dental Medicine (DMD)

CBIO 7100 - Biochemistry. Eighty-one (81) hours.
This is a lecture-type course with the purpose of facilitating the learning of basic biochemical concepts and knowledge that would allow the students to understand, at the molecular level, the normal and pathological processes that occur in human beings.

CBIO 7110 - Gross Anatomy. One hundred and thirty-five (135) hours.
The course presents human macroscopic anatomy with an emphasis on regions and topics of concern to the dental curriculum. Head and neck are treated in the greatest detail, followed by the proximal segments of the upper limb, focusing particularly on the brachial plexus and thoracic viscera. Abdominopelvic viscera are presented as an overview. Images (radiographs, CT, MRI) and clinical relevance are incorporated, especially in head and neck and to a lesser degree in coverage of thorax. The peripheral nervous system is treated with special focus on pathways of pain sensation. Instructional methods are structured lectures, in power point, followed by supervised dissection of cadaveric specimens.

CBIO 7120 - General Histology. Eighty (80) hours.
This course is intended to provide the dental student with a thorough knowledge of the normal microscopic structure of cells, tissues and organs. Throughout the course, special emphasis is placed in the correlation of structure and function at both, light and electron microscopes levels. A series of lectures are devoted to the topic of Cell Biology in order to provide the student with the basic ultrastructural knowledge to understand and integrate the details of function and molecular structure learned in other courses such as Biochemistry, Physiology, Pathology, Immunology and Pharmacology.

CBIO 7130 - Neuroanatomy. Sixty (60) hours.
The course is a complete presentation of basic human Neuroanatomy with more emphasis given to cranial nerves and mechanisms of tactile sensation. Principal instructional methods are lectures and laboratories, which focus on study of prosections of brain specimens.

CBIO 7140 - Oral Histology and Embryology. Forty (40) hours. Pre-requisite: CBIO 7120.
This course is designed to provide the student with sufficient knowledge in the development and histology of those parts of the face and mouth that he will encounter throughout his career in Dentistry. Emphasis will be placed on the clinical applications areas which will be studied throughout the course.

CBIO 7150 - Microbiology. Eighty-four (84) hours.
The course emphasizes fundamental principles of the genetics, growth, metabolism and death of microbes. These principles are balanced with medical and dental aspects of host-parasite relations, immunologic phenomena, and the biological and clinical manifestations induced by major pathogens. Stress is placed on organisms related to dental caries and periodontal and periapical diseases. Further, the student should understand the influence of microorganisms and associated biologic phenomena have on patient health. The course is based on lectures, laboratory exercises and clinical correlations.

CBIO 7160 - Basic Human Physiology for Dental Medicine Students. Ninety-two (92) hours. Pre-requisites: CBIO 7100, CBIO 7110, CBIO 7120, CBIO 7130, CBIO 7140, CBIO 7150.
The course will offer basic physiological knowledge necessary to understand the essential facts and concepts of human physiology, in order to be able to make clinical judgments on a rational scientific basis. The course will be offered using different teaching modalities which include lecture and clinical correlation.

CBIO 7170 - General Systemic Pathology. Seventy-one (71) hours. Pre-requisites: CBIO 7100, CBIO 7110, CBIO 7120, CBIO 7130, CBIO 7140, CBIO 7150.
General and Systemic Pathology is a lecture-type course, which will present the knowledge of fundamental disease processes that affect the cells, tissues and organ systems of the body.

CBIO 7180 - Oral Pharmacology and Therapeutics. Seventy-four (74) hours.
Oral Pharmacology and Therapeutics emphasizes basic aspects of Pharmacology with emphasis on dental applications. It is delivered by the faculty of the Department of Pharmacology and Toxicology of the Medical Sciences Campus School of Medicine, with the collaboration of several faculty of the School of Dentistry. This course is intended to acquaint the student with the basic principles of Pharmacology emphasizing the mechanisms of action, secondary effects and drug interactions and prescriptions and drugs in common use Dentistry and Medicine. The course is taught using lectures and clinical correlations.

CBIO 7190 - Integration of Biomedical Sciences into Dental Practice. Fifty (50) hours.
The purpose of this course is to provide the dental student with the opportunity to correlate basic science courses and topics with the dental clinical management of patients presenting medical conditions. The course will be conducted using the Case Based Learning Strategy.

CBIO 7300 - Remedial Course for National Board Dental Examination Part I. Zero (0) credit. Pre-requisites: Approved Third Year.
This is an independent study course for students who have not approved the National Board Dental Examination Part I after finalizing their Junior Year. Approval of Part I of this exam is required for promotion to third year. This course will offer an intensive study period to prepare for this exam and may include a limited number of hours of clinical work.

DESP 7100 - Introduction to Research in Dental Medicine. Twenty (20) hours.
This course is geared to Dental Medicine Students. Its purpose is to provide an introduction to the concepts and theoretical background of research in Dental Medicine. Students will apprehend basic research concepts needed to interpret scientific literature. The course topics include Basic Epidemiology and Biostatistics, Research Design, Systematic Review of Literature, and Evidence Based Dentistry.

DESP 7117 - Introduction to Professional Development I. Twelve (12) hours.
Through lectures and group discussions this course introduces students to the concept of professionalism and ethics. In order to address this concept, relative areas from education, interprofessional, education and practice, social determinants of health, evidence-based dentistry, and organized professions are also examined. The course will also expose students to the dentist's role in community health and to basic infection control concepts. Grading System: Passed (P), Not Passed (NP)

DESP 7127 - Introduction to Professional Development II. Twenty-six (26) hours. Co-requisite: CBIO 7150.
The course will provide the dental student with an understanding of the health management of patients following standard precautions and reducing to the least the probability of cross-contamination or exposure to any infectious disease or health hazard. The course will introduce the occupational hazards in the dental environment and will provide an understanding of the importance of ergonomics in the dental setting. The course will provide the student with concepts related to the ethics in the treatment of patients and the legal aspects of federal and state laws related to infection control and risk management. The methodology of the course includes lectures, discussion, use of audiovisual aids, presentation of topics by students, projects performed by students and "hand-on" exercises in the clinical setting.

DESP 7237 - Evaluation of Scientific Literature and Epidemiology. Twenty (20) hours.
The purpose of this course for the dental students is to develop the basic skills necessary to interpret scientific literature. The course topics are presented through three general components: Research Design, Biostatistics, and Epidemiology. The course is conducted using lectures, exercises and group discussion.

DESP 7247 - Introduction to Community Dentistry. Twenty (20) hours.
This course offers the students the opportunity to analyze the community concept as the focus of attention and analysis for health care. It presents public health as an integral model for the interpretation of health concepts and health priorities in the community. In addition, teamwork is emphasized as essential in community health problem-solution oriented strategies.

DESP 7357 - Professional Development III. Sixty (60) hours. Pre-requisites: DESP 7117, DESP 7127.
This course has two components. The First Part is concerned with the discussion and analysis of those laws which govern the dentist's professional relationship with the Commonwealth of Puerto Rico, with the patient, and with colleagues. It also introduces the dental student to a series of ethical issues within Dentistry and provides the opportunity to apply ethical principles to clinical situations. The Second Part of the course provides the necessary knowledge and skills to promote effective management of a dental practice. It will develop in the dental student the basic skills to relate effectively with peers, staff and patients; to apply the principles of management and to develop strategies to establish and maintain a dental practice.

DESP 7401 - Ethical, Social and Legal Issues Relevant to the Healthcare Professional Viewed through Film. Thirty-six (36) hours.
This course is aimed to the role of the health professional in society. Health professionals have a unique social position that allows the role of critical thinker, community leader, policies shaping, and role models. The course will allow creativity in approaching emerging societal issues and critical thinking in providing insight and solutions. Emphasis will be placed on legal, administrative and policy issues in Healthcare. The student will select a movie or publication relevant to a healthcare law, a social, administration or policy issue, problem or controversy. The student should analyze the situation and from the health professional point of view, lead his classmates in a thorough discussion. Ethical reasoning and legal principles learned in required prior courses will be applied to social issues. The emphasis is to use those ethical and legal reasoning skills and knowledge to analyze critically controversial issues, particularly related to healthcare.

DESP 7405 - History of Dentistry. Twenty-four (24) hours. Pre-requisites: Approved Third Year Curriculum.
This is an elective course directed to Fourth Year students. The course will cover the subjects of pre-history and history of the human beings from the perspective of Dentistry. Also, the development of the dental profession and its contribution to the improvement of mankind will be discussed. This course will be offered through lectures, group discussions, student's presentations, analysis and discussion of documentaries, as well as, visits to museums and historical and archaeological sites, among others.

DESP 7406 - Management and Financial Aspects of the Dental Practice. Twenty-four (24) hours. Pre-requisites: Approved the Third Year of the curriculum.
This is an elective course which will expand and elaborate on the topics taught in the required Private Practice Administration course. The students will also acquire knowledge and develop skills in areas such as basic economics, credit, financial planning, insurance, marketing contracts and related laws for the optimum functioning in the administration of the dental offices. The course consists of topic presentations, lectures, group discussion exercises and individual practice.

DESP 7407 - Prepaid Plans in Dentistry. Thirty-six (36) hours. Pre-requisites: Approved Third Year of studies.
This course will provide the dental students with an understanding of the prepaid dental plans in the practice of Dentistry. It will introduce the past, present and future of prepaid plans, including background information

and understanding of the health insurance industry profile and the regulation agencies in Puerto Rico. The course will provide students with concepts related to dental coverage, policies and dental provider's agreement, including quality assurance and dental managed care. The methodology of the course includes lectures, discussion panels, laboratory experiences, and presentation of projects performed by students. The laboratory will provide students with the opportunity to practice the theory presented in the course utilizing a dental computer program, as well as practicing in a dentist's office.

DESP 7408 – Forensic Dentistry. Twelve (12) hours. Pre-requisites: Third Year Curriculum.
Basic concepts of forensic dentistry are discussed to train senior dental students to assist local, state and federal authorities in the identification of human remains in criminal cases where the assessment of dental evidence will be used in the quest for truth and justice. This course is conducted by means of group discussion and visits to forensic laboratories, museums and or court.

DESP 7411 - Research Experiences in Dentistry. Thirty-six to one hundred and twenty (36-120) hours. Pre-requisites: Third Year approved.
This course provides dental students the opportunity to explore a variety of research experiences. These experiences include activities in research laboratories, dental schools or other institutions in Puerto Rico, the United States or other countries. Knowledge and skills in research methods are developed through active participation in research activities under the supervision of a mentor.

DESP 7467 - Dental Practice Externship. One hundred and twenty (120) hours. Pre-requisites: First, Second and Third Year approved.
This extramural dental experience course is directed to the senior dental students. The course is designed with the purpose that students develop awareness and better understanding of dental health problems in Puerto Rico as well as positive attitude and willingness to contribute to the solution of such problems. At the end of the course, they will understand different primary dental health care services modalities being given to underserved populations. In addition, the student will be able to deliver services and apply the experiences gained to refine, integrate and enhance knowledge, skills and attitudes necessary to perform comprehensive patient care. This experience may also encourage the student to consider serving in underserved areas in the future and develop their cultural competence in the delivery of oral health care.

EVDI 7105 - Introduction to Assessment and Diagnosis of the Patient. Thirty-eight (38) hours.
The student is introduced to the art of medical history taking, patient interviewing, and the development of communication skills that will enable him/her for proper interaction with the patient and successful arrival at initial assessment. He/she will acquire firsthand knowledge concerning the socioeconomic context, gender, age-related, educational, behavioral and cultural challenges that influence the prevention, diagnosis and treatment of health conditions that affect the population of Puerto Rico. Through statistics and epidemiologic data he/she will develop comprehension of oral health conditions in our population, and also an understanding of the health issues that impact the delivery of healthcare services on the island. Some aspects of gathering clinical data will be presented and the acquisition of the theory and practice of Basic Cardiac Life Support and its protocols. Interviewing skills will be practiced with real standardized patients in a clinical setting.

EVDI 7115 - Human Development and Behavioral Management. Forty-four (44) hours. Pre-requisite: DESP 7117.
This course will study primarily the human being in his life cycle as an integral self. During the first part of the course the development of the human being through an Ecological Framework considering the psychological, social and biological development, will be examined. The understanding of these dimensions is of vital importance in the process of establishing a treatment plan that satisfies the patient's needs. In the second part of the course knowledge regarding human growth and development, as well as, social determinants of

health, will be applied to the behavioral management of the patient. This knowledge will allow to establish an effective dentist-patient relationship, resulting in an uplifting clinical and interpersonal dental experience for both. In addition to seminars and lectures, Case Based Learning and Evidence Based Techniques will be used as the primary instructional strategy during this course.

EVDI 7125 - Dental Anatomy and Functional Occlusion. One hundred and twenty-seven (127) hours.
This is a two-part course consisting of lectures and demonstrations concurrent with laboratory sessions. In the First Part of the course, the students will have the opportunity to learn the morphology and anatomy of the human teeth, their function and their immediate associated parts. The student will reconstruct in wax the coronal portion of permanent maxillary and mandibular teeth following the correct contour and morphology. The Second Part consists of a series of presentations on the basic knowledge of occlusion. The student will mount study casts in a semi-adjustable articulator and wax-up opposing posterior quadrants on the casts. The cast will be waxed to a functional occlusion using a modified addition waxing technique according to the setting of the articulator.

EVDI 7135 - Dental & Craniofacial Imaging. Twenty (20) hours. Pre-requisite: CBIO 7110. Co-requisite: EVDI 7125.
This is a lecture and seminar course designed to familiarize the student with the physical nature of X-Ray radiation, radiation health, types of radiographs, radiographic techniques, and radiographic interpretation for the practice of Oral and Maxillofacial Radiography. Concepts of radiographic processing techniques, quality evaluation, and rectification procedures will be discussed.

EVDI 7245 - Development of the Orofacial Complex. Sixteen (16) hours. Pre-requisites: CBIO 7110, CBIO 7120, CBIO 7140, CBIO 7160.
This course is designed to provide the sophomore dental student with basic knowledge in physical growth and development of the craniofacial complex. This field constitutes essential knowledge for the practice of Dentistry specially in the areas of Orthodontics and Pedodontics. The course includes lectures and discussion of topics from recent scientific literature.

EVDI 7255 - Oral Pathology. Thirty-five (35) hours. Pre-requisite: CBIO 7170.
The dentist been a specialist in the oral and para-oral areas, must be acquainted with the normal and pathological processes seen in the oral and as well as surrounding maxillofacial structures. Therefore, weekly lectures and group discussion of individually assigned subjects, clinical and microscopic documentation of oral disease are presented and analyzed. It includes oral manifestations of systemic diseases in the following categories: 1) disturbances in development and growth, including neoplasia; 2) diseases of microbial origin, including dental caries; 3) and repair; 4) disturbances in metabolism, including nutrition; and 5) diseases of specific systems, such as bones and joints, blood and blood-forming organs, periodontium, skin, nerves, and muscles. This course is offered in Distance Learning Modality.

EVDI 7265 - Oral Diagnosis and Treatment Planning. Fifty-seven (57) hours. Pre-requisites: First Year Curriculum, and Second Year Curriculum (weeks 1 to 20).
This is an integrated course with the participation of faculty from the Restorative and Surgical Sciences Departments. The main goal of the course is to initiate students in the development of the diagnosis and treatment planning competency. Concepts will be presented through lectures, seminars, and case presentations. These concepts include extra and intraoral examinations, charting, records and diagnosis aids. Theory and practice in the development of a treatment plan is also included in the course.

EVDI 7266 - Integration of Oral Medicine and Diagnostic Skills with Oral Pathology: Advanced Course. Forty (40) hours.
The purpose to combine or include with oral pathology is to present the histological pathophysiology of the discussed lesions viewed in previously lectures. At the end of each lecture, case based clinical pathologic correlations (CPC) will be presented to junior dental students to increase their diagnostic acumen, knowledge of disease treatment, disease prognosis as well as criteria or parameters for patient referral to appropriate medical or dental specialist. These case-based presentations will engage and encourage students rational thinking in order to achieve a workable differential diagnosis. At the end of each (CPC) presentation the student is expected to provide at least three sound and workable differential diagnoses. They will be also expected to defend plausibility of their diagnosis.

EVDI 7275 - Assessment and Diagnosis of the Child and Adolescent. Seventeen (17) hours. Pre-requisites: EVDI 7115.
This is a lecture, discussion and laboratory integrated course with the participation of faculty from the Orthodontics and Pediatric Sections focused on the evaluation and diagnosis of the child and adolescent patient. The concept of parental consent, history taking, orofacial exam, habits, etiology of malocclusion, radiology and caries assessment in children as well as detection and report of signs of abuse and neglect will be presented.

PRET 7106 - Cariology. Sixteen (16) hours.
This is a lecture and seminar type course which will discuss fundamental biological, epidemiological and clinical aspects of dental caries. The knowledge provided in the Cariology course is essential for understanding the rationale behind preventive, diagnostic, and therapeutic methods for the control of dental caries.

PRET 7116 - Preventive Dentistry. Forty-four (44) hours. Pre-requisite: CBIO 7100.
The concepts of prevention, philosophy of Preventive Dentistry, levels of prevention and primary preventive measures are discussed in this course. Emphasis is given in the maintenance of oral hygiene by education, products, and techniques. Oral prophylaxis instrumentation techniques and application of nutritional concepts as part of primary prevention and oral health maintenance are also presented in the course. This course is presented by lectures, seminars, laboratories, and clinical experience.

PRET 7126 - Introduction to Restorative Dentistry and Principles of Intracoronal Restorations. Two hundred and fifty (250) hours. Pre-requisites: CBIO 7170, EVDI 7125, PRET 7106.
This course consists of a series of lectures, and laboratories with natural and ivorine teeth, as well as, dental simulator laboratory and clinical experiences, intended to provide the students with the basic knowledge and skills, necessary for an adequate performance in the field of Operative Dentistry during their clinical practice. The course will cover the basic treatment of carious lesions that need to be restored with composite resin, amalgam, cast gold and porcelain dental materials. It has been designed to address from the minimal invasive interventions to more complex situations of severely affected teeth. It includes fissure sealants, vital bleaching techniques and an overview on new materials for preventive and aesthetics considerations. Emphasis will be given to the principles of cavity preparation and restoration of individual teeth under a philosophy of prevention and preservation of tooth structure.

PRET 7136 - Clinical Application on Dental Skills. Fifty-four (54) hours. Pre-requisites: EVDI 7125, EVDI 7135, PRET 7106, PRET 7116.
This course will introduce the student to the clinic by experiences in two areas: Radiology and Functional Occlusion. In the Dental Imaging Rotation Radiograph, taking, mounting and interpretation will be performed. Diagnostic casts will be prepared and mounted in a semi-adjustable articulator in the area of Functional Occlusion.

PRET 7246 - Removable Prosthodontics. Two hundred and fifty-three (253) hours. Pre-requisite: EVDI 7125.
This lecture and laboratory preclinical course provide dental students with the knowledge of the clinical and the laboratory procedures necessary to be able to construct removable complete and partial dentures. The teaching material is presented in a sequential and integrated manner combining and relating it to other laboratory and clinical procedures which are pertinent in Removable Prosthodontics. Preventive techniques in design couple with sound biomechanical principles in the construction of RPD are stressed in this course. Students are also required to do independent study to expand their knowledge and to correlate the laboratory with the clinical environment.

PRET 7257 - Periodontics. Fifty-five (55) hours. Pre-requisites: First Year Curriculum, EVDI 7245, EVDI 7255, EVDI 7265.
This is a lecture and discussion course which presents students the general concepts of the theoretical basis of periodontal practice and the science and art of surgical procedures. During the course the student will be able to integrate the philosophy of comprehensive treatment of various periodontal, dental restorative, endodontic, orthodontic, prosthodontic, and medical measures that are necessary to treat periodontal problems. It is expected that students formulate plans to suit the physical, psychological, and financial needs of the individual patient.

PRET 7266 - Oral Surgery. Thirty (30) hours.
Through lectures and group discussion is expected that students will learn the basic principles of undergraduate Oral Surgery. The student is introduced to the subject in a progressive sequence, from the first meeting with the patient to the removal of teeth. Problems and complications related to the patient are presented.

PRET 7276 - Fixed Prosthodontics. Two hundred and fifty (250) hours. Pre-requisite: EVDI 7125.
This course through lectures, discussion, laboratory, and clinical practice presents the principles of fundamentals in Fixed Prosthodontics. All basic crown and fixed prosthodontics dental preparations and restoration techniques are discussed, studied, demonstrated and done in order to prepare the student for an optimal clinical performance in the comprehensive treatment of dental patients. The mechanical, biological and dental material considerations related to Fixed Prosthodontics will be emphasized based on the concept that a dental restoration is a biological necessity.

PRET 7277 - Pediatric Dental Treatment. Thirty-two (32) hours. Pre-requisites: First Year Curriculum, EVDI 7275.
This course is designed to provide the sophomore dental student with all the contemporary concepts in managing the oral health of non-medical compromised children and adolescents. It includes topics of restorative techniques, pulpal therapy in primary and mixed dentition, space maintenance, behavior management and local anesthesia techniques applied to pediatric dentistry. Emphasis is made in the importance to integrate all information compiled through the diagnostic records and the clinical exam in order to design and deliver comprehensive treatment to the patients. The course includes lectures, demonstrations, assigned readings and laboratory exercises.

PRET 7286 - Apprehension and Pain Control. Twenty-two (22) hours. Pre-requisites: CBIO 7110, CBIO 7130, CBIO 7180, EVDI 7135.
Through lectures, discussion, and clinical demonstrations, students are introduced in the application of the psychological and chemical modalities for the prevention and treatment of pre-operative and post-operative patient apprehension and pain control.

PRET 7296 - Endodontics. Ninety-five (95) hours. Pre-requisites: First Year Curriculum, EVDI 7255.
This course for dental sophomore students consists of a series of lectures, seminars, demonstrations and laboratory exercises related to the prevention and treatment of pulpal and periapical diseases. The rationale and armamentarium for conventional root canal therapy, vital pulp therapy, and non-surgical re-treatments are discussed in this course. Laboratory includes exercises to perform conventional root canal therapy and non-surgical retreatment. Acrylic and natural extracted teeth are used in the exercises.

PRET 7298 - Orthodontic Treatment Planning. Fifty-seven (57) hours. Pre-requisites: First Year Curriculum.
This course is designed to develop the basic knowledge in Orthodontics for the practice of General Dentistry. Topics covered are treatment of malocclusions in the deciduous and mixed dentition of the child and adolescent, as well as the identification and referral of corrective orthodontic malocclusion treatments in the permanent dentition. The course includes lectures, group discussions and laboratory exercises.

PRET 7300 - Preparatory Clinical and Academic Integration for International Students. One hundred eighty (180) hours.
This course, designed for internationally trained dentists admitted to the Advanced Placement Program, consists of a series of lectures, seminars, demonstrations, and laboratory exercises related to the diagnosis, prevention of treatment of diseases, disorders and conditions of the oral cavity. The general objective of this course is to enable the student the opportunity to integrate the knowledge and skills previously obtained with the clinical and academic philosophy of the School of Dental Medicine, as well as with the criteria, equipment, and armamentarium used at the school. As a result, they will be prepared to enroll the third clinical year in the regular Dental Medicine Doctorate Program. Grading System: Passed (P), Not Passed (NP)

PRET 7316 - Dental Care for the Special Patients. Twenty-eight (28) hours.
In the treatment for the special patients the dentist faces many features different from the normal. It is important to understand the basic differences from the normal in order to provide a comprehensive care to this population. This course is designed to provide the undergraduate dental student the basic theoretical knowledge necessary as background for the dental care of the disabled patient. The course consists of lectures and discussion sessions on topics related to various physical, mental and emotional handicapping conditions.

PRET 7330 - Review for the Integrated National Dental Board Examination. Fifty-four (54) hours. Pre-requisites: First and Second Year approved.
This is a review course to prepare students for the Integrated National Board Dental Examination. Short lectures on the topics covered in the examination, discussion of board type questions, and practice exams will be provided. At the end of the course a practice test will be administered.

PRET 7336 - Advanced Oral Surgery. Twenty (20) hours. Pre-requisite: PRET 7266.
This course presents advanced and complicated topics about Oral and Maxillofacial Surgery. The Junior students are exposed to the special considerations that should be taken in the diagnosis, management and treatment of Oral and Maxillofacial Pathology, trauma, temporo mandibular joint/temporo mandibular dysfunction, dentofacial deformities and pre-prosthetic surgery. Lectures, case presentations, and discussions are used as the main teaching method.

PRET 7346 - Clinical Occlusion and Temporo Mandibular Dysfunction Management. Twenty (20) hours. Pre-requisite: EVDI 7125.
This course will be concerned with basic Anatomy and Physiology of the Stomatognathic System and methods of examining the patient in pain and dysfunction. The course will be offered through lectures and discussion, and the method for solving occlusal problems cases will be illustrated. Procedures for diagnosing temporomandibular joints, occlusal, mandibular muscle, vascular and cranial nerve pathology or dysfunction

will be outlined. Different types of temporomandibular joints internal derangement and arthritis will be described and methods of diagnosing them will be presented.

PRET 7356 - Medical Emergencies. Sixteen (16) hours. Pre-requisites: First and Second Year approved.
The advances in Modern Medicine allow the medically ill patients to live longer and healthier lives; but at the same time, these patients will look for dental care, exposing the dentist to a more medically compromised population. The dentist must be prepared to understand and manage this kind of patient. He must be prepared to evaluate; prevent and manage medical emergency situations that may arise during dental treatment. This course is designed to train the dental students in the evaluation prevention and management of a wide variety of medical emergencies, through lectures, demonstrations, emergency room rotations, live workshop and emergency drills.

PRET 7366 - Implant Dentistry. Twelve (12) hours. Pre-requisites: First- and Second-Year Curriculum.
This course is an introduction to Dental Implantology as a treatment modality in the management of partial or total Edentulism. It integrates the basic sciences and clinical disciplines in order to present the scientific basis of successful treatment with dental implants. Covers the biological and biomechanical principles of successful treatment with osseointegrated implants. Includes the surgical protocol used for the successful and predictable insertion of dental implants, the evaluation and selection of patients, and treatment planning when considering patients for prosthetic treatment. Treatment options, limitations and possible complications when treating patients with dental implants are also presented. Maintenance of patients with prosthetic treatment over dental implants is also presented. This content is presented through lectures with digital audiovisual aids, case presentations, demonstrations, and clinical practice.

PRET 7376 - Geriatric Dentistry. Twelve (12) hours. Pre-requisites: First- and Second-Year Curriculum.
This course offers the student knowledge, skills and values required for the provision of oral health care to older adults; adults who are affected by physical, social, psychological and/or biological changes associated with aging, with or without concomitant disease. Depending upon the degree of impairment, older adults may be classified as functionally independent, frail, or functionally dependent. The course is conducted through lectures, discussion and case presentations.

PRET 7387 - Third Year Comprehensive Care Clinic. Eight hundred and ninety-three (893) hours. Pre-requisites: Dental Medicine School First- and Second-Year courses and approval of Part I of the National Board Dental Exam.
The Third Year Comprehensive Care Clinic course is designed to provide dental students the experience of comprehensive patient care, in order to develop clinical skills for the prevention, diagnosis and treatment of oral diseases, as well as the ethical and professional competencies for the practice of general dentistry. This is a clinical practice course under close faculty supervision.

PRET 7400 - Comprehensive Care Clinic. One thousand (1,000) hours. Pre-requisites: PRET 7387, approved the First Part of the National Board Dental Examination.
The Fourth Year Comprehensive Care Clinic is designed to provide the senior dental student the experience of comprehensive care treatment. In this course, the student will apply and integrate the knowledge and skills acquired during the previous three (3) years of dental studies, under faculty supervision.

PRET 7401 A learning Experience: Teaching in Preclinical Prosthodontic Laboratory. Twenty-four (24) hours. Pre-requisites: PRET 7246, PRET 7276.
This course is designed for fourth year students that show interest and ability in the field of Prosthodontics and commitment with the academy. The course consists of a series of lectures, demonstrations and laboratory teaching experiences. The material is presented in a sequential and integrated manner combining and related to the laboratory activity that will be mentoring by the student. Students are also required to

independently study in order to expand their knowledge. The purpose of this course is to provide a teaching experience in a prosthodontic laboratory course to students interested in an academic career and at the same time have a peer perspective on preclinical laboratory courses.

PRET 7405 - Oral Health Promotion in a Special Community. Thirty-six (36) hours. Pre-requisites: Approved First, Second, and Third Year.
This is an elective course designed for dental students to provide clinical education in a disadvantaged community. Its purpose is to sensitize students towards the community´s sociocultural characteristics. Students are expected to develop skills to understand the community and its priorities towards oral health, design and implement a preventive clinical-education program in the selected community, and report the results of the intervention. Educational activities include visits to the community, videos, meetings with community leaders, and with members of the Oral Health Division of the Department of Health.

PRET 7406 - Restoration of Endodontically Treated Teeth. Twenty-four (24) hours. Pre- requisites: Third Year Curriculum.
This course consists of a series of lectures involving all the present techniques for restoration of endodontically treated teeth. All of these techniques will be practiced in the laboratory, on extracted teeth. Students will also practice these techniques in some patients under the supervision of a faculty member.

PRET 7407 - Dental Photography. Twenty-four (24) hours. Pre-requisites: Third Year curriculum approved.
This course introduces the student to the use of dental imaging and photography in several areas such as: treatment planning, record keeping, continuing education, staff education, dental insurance and others. The course covers topics related to the combination of digital technology and photography and the use of digital images for patient education. This course will be delivered through twenty-four (24) hours of lectures, demonstrations and clinical practice.

PRET 7408 - Effective Tobacco Control Interventions for Patients in the Dental Office. Twenty-four (24) hours. Pre-requisites: Approved Third Year of the curriculum.
This course provides the student with the basic knowledge necessary for including brief tobacco control interventions for patients in their dental practice. The students have the opportunity of visiting a Smoking Cessation Clinic during the evaluation of patients. The purpose of this visit is to show them the diagnostic approach with these patients. This course will be conducted with the use of conferences, clinical visits, and student presentations.

PRET 7409 - Sports Dentistry. Twenty-four (24) hours. Pre-requisites: Approved Third Year curriculum.
This is an elective course for senior students which includes demonstrations and laboratory exercises as well as lectures from invited faculty and students. All contemporary concepts in managing oral health in sports, including prevention and treatment of sport related injuries and recommended treatment in common and/or advanced athletes are considered.

PRET 7410 - Clinical Experiences in Dental Treatment. Forty to eighty (40-80) hours. Pre-requisites: Third Year approved.
This course will provide the student with the opportunity to provide dental care, under the supervision of a senior dental professional, in a hospital or health center environment. Emphasis will be placed on providing dental care to medically compromised patients. Students will have the opportunity to attend medical rounds, dental case presentations, clinical seminars, and lectures.

PRET 7415 - Nitrous Oxide Inhalation Sedation in Dentistry. Forty-eight (48) hours. Pre-requisites: Third Year curriculum approved.
The course is designed to teach the student the use of N2O inhalation sedation for control of pain and apprehension in General Dentistry Practice. The instructional strategies to be used are: lecture, group discussions, clinical demonstration and supervised clinical practice.

PRET 7416 - Use of Microscope in Dentistry. Twenty-four (24) hours. Pre-requisites: Third Year Curriculum.
This course is designed to develop knowledge and skills in the use of the dental clinical microscope in the different disciplines of Dentistry. The student will also have the opportunity to do clinical procedures utilizing the microscope.

PRET 7417 - Endodontic Treatment in Molars. Twenty-seven (27) hours. Pre-requisites: Third year curriculum.
This course consists of a series of lectures, demonstrations and laboratory exercises related to the prevention and treatment of pulpal and periapical diseases. Laboratory practice will be focused in root canal treatment for molars. The rationale and armamentarium for conventional root canal therapy are discussed in this course. Laboratory exercises consist of root canal therapy in natural extracted mandibular and maxillary molars.

PRET 7419 - The Dentist in the Hospital Environment. Thirty-six (36) hours. Pre-requisites: Third Year curriculum approved.
This course is designed for senior dental students to develop knowledge and skills to comprehend hospital organization, protocol procedures and professional requirements in order to participate as a member of the health team, and provide optimal patient care.

PRET 7425 - Maxillofacial Prosthetics and Dental Oncology. Twelve (12) hours.
The course will introduce the student to the subspecialty of dental oncology and maxillofacial prosthetics. The student will learn how cancer patients are treated prior, during and after cancer treatment in the areas of surgery, radiation therapy and chemotherapy with emphasis of a team approach with other professionals in the field of cancer treatment. In addition, the student will be introduced to the role of prosthodontics in the rehabilitation of these patients. In this course discusses item about psychodynamic interactions, maxillectomy anatomy, principles of maxillofacial RPD, maxillary obturators, radiation therapy oral manifestations, oral complications, management, extraoral prosthesis, special prosthesis.

PRET 7426 - Review Basic Concepts and Laboratory in Removable, Fixed and Implant Prosthesis for International Students. Fifty-four (54) hours. Pre-requisites: PRET 7300
This course is designed for internationally trained dentist admitted to the Advance Placement Program that have approved the National Boards Part I and II. The course consists of a series of lectures, seminars, demonstrations and laboratories exercises related to Fixed, Removable and Implant prosthodontics. The teaching material is presented in a sequential and integrated manner combining/relating it to laboratory and clinical procedures. Students are also required to independently study in order to expand their knowledge and correlate the laboratory and clinical environment.

PRET 7427 - Craniomandibular Stabilization. Twenty-seven (27) hours.
This elective course is designed to provide the dental students with the opportunity to develop proficiency in their analytic and psychomotor skills in the treatment of patients needing dentognatic orofacial rehabilitation suffering temporomandibular disorders. In addition, the student will be introduced to the importance of a holistic and comprehensive approach to diagnose and treat patient temporomandibular disorders in order to attain and maintain optimum oral health.

PRET 7428 - Dental Biomaterials Clinical Applications. Thirty (30) hours.
This is a Lecture-Seminar course dealing with the clinical aspects of dental biomaterials. Emphasis will be given to the clinical significance of material's properties and proper management of dental materials. This course will also involve the students in the search of recently published literature related to the course and promote effective learning through discussion groups.

PRET 7429 - Advanced Operative and Esthetic Dentistry. Seventy-two (72) hours.
This course, intended for 4th year dental students, is designed to develop knowledge, skill and understanding on advanced operative and esthetic dentistry. The student will also have the opportunity to perform a clinical procedure.

PRET 7435 - Technological Advances in Oral Health Care. Eighty-one (81) hours. Pre-requisites: Third Year Dental Curriculum.
This course is designed to help students develop knowledge, skills and understanding of how technological advances are transforming oral health care and the uses of these technologies. The student will have the opportunity to perform laboratory and clinical procedures utilizing new technologies.

PRET 7436 - Dental Medicine and Public Policy. Forty-five (45) hours. Pre-requisites: Third Year Dental Curriculum.
In this course, students will analyze the role of the dentist in the development of policies in the areas of service providing, work setting, government, organizations, public health and the community. The social, economic, legal, bioethical and technological impact on health policy from a local, national and global perspective will be studied.

PRET 7445 – Oral Health Issues in Sexual and Gender Minorities. Forty-five (45) hours. Pre-requisites: Third Year Dental Curriculum.
In this course the overall complexity of human sexuality across the life span and its impact on the dental practice using a multidisciplinary approach, will be explored. Gender issues and sexual minority backgrounds will also be discussed. Students are expected to develop skills and strategies on how dental practitioners must manage these issues while providing oral health care to patients. The aim of this course is to increase cultural competency of professionals of oral health with these communities.

POST-GRADUATE PROGRAMS COURSES

BIOR 9005 - Advanced Oral Biology Core Course. Five (5) credits.
The discipline of Oral Biology deals with the structural development and functions of the oral tissues, their interrelationships, and their relation to other organ systems in both healthy and disease stages. The intent of this course is to provide a basis and a logical educational bridge between the Biomedical Sciences and the Clinical Practice of Dental Specialties.

CIOM 9418 - Oral and Maxillofacial Surgery for Exchange Students. One to seven (1-7) credit(s).
It consists of an internship in the Oral and Maxillofacial Surgery Post-Doctoral Program of a resident coming from another institution which maintains a formal relationship of exchange of students with our campus. The main purpose of this course is to offer didactic and clinical experiences in a different environment from the institution they came from.

CIOM 9460 - General Anesthesia Rotation. Three (3) credits.
Four (4) months rotation on the General Anesthesia Department of the School of Dentistry where the Oral and Maxillofacial Surgery resident performs as if he were a first General Anesthesia resident. The physiology

and pharmacology of anesthetics agents is presented. Practical and didactic instruction on techniques and management of hospitalized and outpatients.

CIOM 9511 - Seminars, Review of Literature Case Presentations I. Four (4) credits.
Presentations by residents and faculty of seminars, journals, and interesting cases related to the practice of Oral and Maxillofacial Surgery.

CIOM 9512 - Seminars, Review of Literature Case Presentations II. Four (4) credits. Pre-requisite: CIOM 9511.
Presentations by residents and faculty of seminars, journals, and interesting cases related to the practice of Oral and Maxillofacial Surgery.

CIOM 9521 - Seminars, Review of Literature Case Presentations III. Four (4) credits. Pre-requisite: CIOM 9512.
Presentations by residents and faculty of seminars, journals, and interesting cases related to the practice of Oral and Maxillofacial Surgery.

CIOM 9522 - Seminars, Review of Literature Case Presentations IV. Four (4) credits. Pre-requisite: CIOM 9521.
Presentations by residents and faculty of seminars, journals, and interesting cases related to the practice of Oral and Maxillofacial Surgery.

CIOM 9531 - Seminars, Review of Literature Case Presentations V. Four (4) credits. Pre-requisite: CIOM 9522.
Presentations by residents and faculty of seminars, journals, and interesting cases related to the practice of Oral and Maxillofacial Surgery.

CIOM 9532 - Seminars, Review of Literature Case Presentations VI. Four (4) credits. Pre-requisite: CIOM 9531.
Presentations by residents and faculty of seminars, journals, and interesting cases related to the practice of Oral and Maxillofacial Surgery.

CIOM 9541 - Seminars, Review of Literature Case Presentations VII. Four (4) credits. Pre-requisite: CIOM 9532.
Presentations by residents and faculty of seminars, journals, and interesting cases related to the practice of Oral and Maxillofacial Surgery.

CIOM 9542 - Seminars, Review of Literature Case Presentations VIII. Four (4) credits. Pre-requisite: CIOM 9541.
Presentations by residents and faculty of seminars, journals, and interesting cases related to the practice of Oral and Maxillofacial Surgery.

CIOM 9611 - Hospital Procedures I. Two (2) credits.
Supervised work in the ambulatory clinics, Emergency Room, Operation Room, admitted patients, and rotations in the medical-hospital departments.

CIOM 9612 - Hospital Procedures II. Two (2) credits. Pre-requisite: CIOM 9611.
Supervised work in the ambulatory clinics, Emergency Room, Operation Room, admitted patients, and rotations in the medical-hospital departments.

CIOM 9621 - Hospital Procedures III. Two (2) credits. Pre-requisite: CIOM 9612.
Supervised work in the ambulatory clinics, Emergency Room, Operation Room, admitted patients, and rotations in the medical-hospital departments.
CIOM 9622 - Hospital Procedures IV. Two (2) credits. Pre-requisite: CIOM 9621.
Supervised work in the ambulatory clinics, Emergency Room, Operation Room, admitted patients, and rotations in the medical-hospital departments.

CIOM 9631 - Hospital Procedures V. Two (2) credits. Pre-requisite: CIOM 9622.
Supervised work in the ambulatory clinics, Emergency Room, Operation Room, admitted patients, and rotations in the medical-hospital departments.

CIOM 9632 - Hospital Procedures VI. Two (2) credits. Pre-requisite: CIOM 9631.
Supervised work in the ambulatory clinics, Emergency Room, Operation Room, admitted patients, and rotations in the medical-hospital departments.

CIOM 9641 - Hospital Procedures VII. Two (2) credits. Pre-requisite: CIOM 9632.
Supervised work in the ambulatory clinics, Emergency Room, Operation Room, admitted patients, and rotations in the medical-hospital departments.

CIOM 9642 - Hospital Procedures VIII. Two (2) credits. Pre-requisite: CIOM 9641.
Supervised work in the ambulatory clinics, Emergency Room, Operation Room, admitted patients, and rotations in the medical-hospital departments.

CIOM 9731 - Cosmetic and Reconstructive Surgery of the Maxillofacial Region I. Two (2) credits. Pre-requisites: Second Year resident's courses approved.
First theoretical and hands-on course for Third Year residents in which the technical details, indications, contraindications, and complications related to Cosmetic and Reconstructive Surgery of the Maxillofacial Region are taught. The following topics will be covered: Cosmetic Anatomy, Facial Implantology, Rhinoplasty, Blepharoplasty, Mentoplasty, Cheiloplasty, Rytidectomies, Collagen Injections and other Materials.

CIOM 9741 - Cosmetic and Reconstructive Surgery of the Maxillofacial Region II. Two (2) credits. Pre-requisite: CIOM 9731.
Theoretical and hands-on course for the Senior residents in which the technical details, indications, contraindications, and complications related to Cosmetic and Reconstructive Surgery of the Maxillofacial Region are taught. The following topics will be covered: Cosmetic Anatomy, Facial Implantology, Rhinoplasty, Blepharoplasty, Mentoplasty, Cheiloplasty, Rytidectomies, Collagen Injections and other Materials. The resident will be involved in the treatment of more complicated cases and a higher degree of proficiency will be expected in the treatment of the patients.

CIOM 9742 - Cosmetic and Reconstructive Surgery of the Maxillofacial Region III. Two (2) credits. Pre-requisites: CIOM 9731, CIOM 9741.
Theoretical and hands-on course for the Senior residents in which the technical details, indications, contraindications, and complications related to Cosmetic and Reconstructive Surgery of the Maxillofacial Region are taught. The following topics will be covered: Cosmetic Anatomy, Facial Implantology, Rhinoplasty, Blepharoplasty, Mentoplasty, Cheiloplasty, Rytidectomies, Collagen Injections and other Materials. The resident will be involved in the treatment of more complicated cases and a higher degree of proficiency will be expected in the treatment of the patients.

CIOM 9830 - Theory and Practice of Deep Sedation-General Anesthesia. Three (3) credits.
Didactic and practical course for Oral and Maxillofacial Surgery residents where they will be taught the theoretical and practical foundations for the safe administration of ambulatory Deep Sedation-General Anesthesia.

CIOM 9847 - Research Completion Project. Six (6) credits. Pre-requisite: CIOM 9521.
The resident will perform, supervised by a faculty member, research project approved by the Research Committee of the Oral and Maxillofacial Surgery Program. After completing it the resident will make a written request for the presentation of the research project to the program faculty. This presentation will be oral and written in the format approved by the Research Committee of the School of Dentistry. In the oral presentation the resident must show that he/her has a broad and deep knowledge of the researched area, will present and defend all the research details, its results and conclusions.

EDSU 6501 - Systematic Planning of Instruction. Three (3) credits.
This course provides the student the opportunity of developing the knowledge, skills, and attitudes to the roles of teacher: learning facilitator, academic counselor, human relations facilitator, member of a teaching team and a health specialist. Special consideration is given to the systematic planning and design of learning experience.

EDSU 6503 - Principles of Curriculum Design and Development. Three (3) credits.
This course is designed to develop in the participant's basic skills and positive values in the area of curricular design and development, as it relates to the educational programs in the Health Sciences.

MEDI 7400 – Fundamentals of General Pediatrics. Two (2) credits.
The students will acquire fundamental knowledge in the field of General Pediatrics in order to properly evaluate their pediatric patients. The course is composed of ten 2 hour sessions covering relevant topics of pediatrics regarding growth and development, prevention and diagnosis, treatment and management of significant pediatric medical conditions. The students will be able to assess the overall health status of their patients and identify those who need further intervention.

MEDI 9300 - Physical Diagnosis. Three (3) credits.
The course comprises both of the essential processes for the clinical study of disease: the history of the patient's disability, and the complete physical examination. Offered during the Second Semester to Second Year medical students in third three sessions from 1:00 to 5:00 pm on Tuesday and Thursdays. The students will rotate through participating hospitals for the clinical exercise covering the different organ systems.

ORTO 9101 - Orthodontic Literature Review I. One (1) credit. Co-requisites: ORTO 9102, ORTO 9104, ORTO 9105, ORTO 9106.
This is a course in which the graduate orthodontic student will be responsible for obtaining from the library or any other resource, reading, critically evaluating, and presenting to the faculty and their peers, a broad range of scientific articles, dealing with or associated to the art and science of Orthodontics. These articles will be directly related to and complementary with the subject matter of the other Orthodontic courses taken during each semester.

ORTO 9102 - Post Graduate Orthodontic Laboratory I. Three (3) credits. Co-requisites: ORTO 9101, ORTO 9105, ORTO 9106.
Intensive technical instruction and lectures in the assembling and manipulation of orthodontic appliances. Appliances are constructed and when necessary, the Typodont Technique is utilized. Emphasis is given to band adaptation, wire manipulation, the edgewise orthodontic appliance, and extraoral orthopedic appliances.

ORTO 9103 - Orthodontic Post Graduate Clinic I. Eight (8) credits. Co-requisites: ORTO 9101, ORTO 9102, ORTO 9104, ORTO 9105, ORTO 9106, ORTO 9107.
This course is designed to expose the Post-Graduate Orthodontics students to their first clinical experience in this specialty area. It provides the opportunity to learn from different clinical cases which students are expected to diagnose, treat, and follow-up the following three years. The use of fixed edgewise, extraoral, removable, functional, and retentive appliances is emphasized. The student should develop analytical biomechanical and motor skills as they apply specifically to Orthodontics. Grading System: Passed (P), Fail (F)

ORTO 9104 - Craniofacial Growth and Development. Two (2) credits. Co-requisites: ORTO 9101, ORTO 9105, ORTO 9106.
This course is designed to provide the Orthodontic graduate resident with basic knowledge in physical growth and development of the craniofacial complex. Theories of growth, teeth, facial bones, and masticatory as well as expression muscles are reviewed in depth. The field constitutes essential knowledge to the practice of Orthodontics. Grading System: Passed (P), Fail (F)

ORTO 9105 - Orthodontic Diagnosis and Treatment Planning I. Ten (10) credits. Co-requisites: ORTO 9101, ORTO 9102, ORTO 9103, ORTO 9104, ORTO 9106, ORTO 9107.
This course is designed to prepare the Orthodontic resident in the processes of taking and analyzing diagnostic records, clinical evaluation and in conjunction with the patient's medical and dental history, be able to design a problem list and treatment objectives. An intense review of the literature will support the decision-making process and scientific articles will be assigned on each session. The didactic experience will be performed through daily seminars or conferences during the month of July and seminars during the First Semester. Grading System: Passed (P), Fail (F)

ORTO 9106 - Principles of Biomechanics in Orthodontics. One (1) credit. Co-requisite: ORTO 9102.
The course will have a one-year (two semesters; approximately 50% of the material will be covered in each semester) length. It is designed for the First-Year Orthodontic graduate students. In depth review of several topics related to the general area of biomechanical principles necessary to perform orthodontic tooth general movements is expected. Basic knowledge related to materials and their clinical use is also included. Mechanics are specifically discussed for the straight wire appliance, the segmented arch technique, and to a lesser extent older approaches as the standard edgewise and the begg appliance. Grading System: Passed (P), Fail (F)

ORTO 9107 - Case Presentation Seminar I. Two (2) credits. Co-requisites: ORTO 9101, ORTO 9102, ORTO 9104, ORTO 9105, ORTO 9106.
During the sessions, the residents will present all their clinical cases to the clinical instructor responsible for the clinic on that day. All diagnostic records will be thoroughly evaluated, and a treatment plan will be developed to address the clinical problems presented on each case. The residents will be examined in their knowledge on diagnosis and a treatment planning, scientific literature, treatment modalities, and orthodontic appliances. Based on this experience the resident will be exposed to different treatment alternatives and will develop a sense of clinical judgment based on a multidisciplinary approach. Grading System: Passed (P), Fail (F)

ORTO 9201 - Orthodontic Literature Review II. Two (2) credits. Pre-requisites: ORTO 9101, ORTO 9102, ORTO 9103, ORTO 9104, ORTO 9105, ORTO 9106, ORTO 9107. Co-requisites: ORTO 9202, ORTO 9203, ORTO 9205, ORTO 9206, ORTO 9207, ORTO 9208.
This is a course in which the graduate orthodontic student will be responsible for obtaining from the library or any other resource, reading, critically evaluating, and presenting to the faculty and their peers, a broad range of scientific articles, dealing with or associated to the art and science of Orthodontics. These articles

will be directly related to and complementary with the subject matter of the other orthodontic courses taken during each semester.

ORTO 9202 - Post Graduate Orthodontic Laboratory II. Two (2) credits. Pre-requisites: ORTO 9101, ORTO 9102, ORTO 9103, ORTO 9104, ORTO 9105, ORTO 9106, ORTO 9107. Co-requisites: ORTO 9201, ORTO 9203, ORTO 9205, ORTO 9206, ORTO 9207, ORTO 9208.
Intensive technical instruction and lectures in the assembling and manipulation of orthodontic appliances. Appliances are constructed and when necessary, the Typodont Technique is utilized. Emphasis is given to band adaptation, wire manipulation, the edgewise orthodontic appliance and extraoral orthopaedic appliances.

ORTO 9203 - Orthodontic Post Graduate Clinic II. Eight (8) credits. Pre-requisites: ORTO 9101, ORTO 9102, ORTO 9103, ORTO 9104, ORTO 9105, ORTO 9106, ORTO 9107. Co-requisites: ORTO 9201, ORTO 9202, ORTO 9205, ORTO 9206, ORTO 9207, ORTO 9208.
This course is designed to expose the Post-Graduate Orthodontic students to their first clinical experience in this specialty area. It provides the opportunity to learn from different clinical cases which students are expected to diagnose, treat and follow-up for the following three years. The use of fixed edgewise, extraoral removable, functional and retentive appliances is emphasized. The student should develop analytical biomechanical and motor skills as they apply specifically to Orthodontics. A higher level of proficiency and greater independence levels are expected in this course as compared to ORTO 9103. Grading System: Passed (P), Fail (F)

ORTO 9205 - Orthodontic Diagnosis and Treatment Planning II. Two (2) credits. Pre-requisites: ORTO 9101, ORTO 9102, ORTO 9103, ORTO 9104, ORTO 9105, ORTO 9106, ORTO 9107. Co-requisites: ORTO 9201, ORTO 9202, ORTO 9203, ORTO 9206, ORTO 9207, ORTO 9208.
This course is designed to prepare the Orthodontic resident in the processes of taking and analyzing diagnostic records, clinical evaluation and in conjunction with the patient's medical and dental history, be able to design a problem list and treatment objectives. An intense review of the literature will support the decision-making process and scientific articles will be assigned in each session. The didactic experience will be performed through daily seminars or conferences during the month of July and weekly seminars during the First Semester. Grading System: Passed (P), Fail (F)

ORTO 9206 - Orthodontic Dental Materials. One (1) credit. Pre-requisites: ORTO 9101, ORTO 9102, ORTO 9103, ORTO 9104, ORTO 9105, ORTO 9106, ORTO 9107. Co-requisites: ORTO 9201, ORTO 9202, ORTO 9203, ORTO 9205, ORTO 9207, ORTO 9208.
The course is designed for the First-Year Orthodontic graduate students. In depth review of several topics related to the general area of Orthodontic dental materials. Basic knowledge related to the structure of mater is reviewed. Grading System: Passed (P), Fail (F)

ORTO 9207 - Case Presentation Seminar II. Two (2) credits. Pre-requisites: ORTO 9101 to ORTO 9107. Co-requisites: ORTO 9201 to ORTO 9203, ORTO 9205, ORTO 9206, ORTO 9208.
During the sessions, the residents will present their clinical cases to the clinical instructor responsible for the clinic on that day. All diagnostic records will be thoroughly evaluated, and treatment plan will be developed to address the clinical problems presented on each case. The residents will be examined in their knowledge on diagnosis and treatment planning, scientific literature, treatment modalities and orthodontic appliances. Based on this experience, the resident will be exposed to different treatment alternatives and will develop a sense of clinical judgment based on a multidisciplinary approach.

ORTO 9208 - Orthodontic Interdisciplinary Seminar I. Two (2) credits. Pre-requisites: ORTO 9101 to ORTO 9107. Co-requisites: ORTO 9201 to ORTO 9203, ORTO 9205 to ORTO 9207.
This course is designed to train the Orthodontic graduate residents in the diagnosis, treatment planning, and clinical management of patients undergoing orthognathic or craniofacial surgery. A broad variety of lectures covering the most important aspects of surgical orthodontics including its multi-disciplinary management will be presented. Readings will be assigned for each lecture and the residents will actively participate during the presentation. Seminars and interdisciplinary staffing concerning congenital malformations of the jaw with particular emphasis placed on congenital clefts of the lip and palate, craniofacial syndromes and orthognathic surgery cases will be presented. The embryology, etiology and morphology of congenital facial malformations will be discussed. Post-natal growth problems and associated complications in respiration, deglutition, mastication and speech will be studied. Longitudinal growth studies will be presented revealing growth, developmental and functional changes. Treatment modalities and outcomes will be critically evaluated. Grading System: Passed (P), Fail (F)

ORTO 9301 - Orthodontic Literature Review III. Two (2) credits. Pre-requisites: ORTO 9101, ORTO 9102, ORTO 9103, ORTO 9104, ORTO 9105, ORTO 9106, ORTO 9107, ORTO 9201, ORTO 9202, ORTO 9203, ORTO 9205, ORTO 9206, ORTO 9207, ORTO 9208. Co-requisites: ORTO 9303, ORTO 9304, ORTO 9307, ORTO 9306.
This is a course in which the graduate Orthodontic student will be responsible for obtaining from the library or any other resource, reading critically, evaluating, and presenting to the faculty and their peers a broad range of scientific articles, dealing with or associated to the art and science of Orthodontics. These articles will be directly related to and complementary with the subject matter of the other orthodontic courses taken during each semester.

ORTO 9303 - Orthodontic Post Graduate Clinic III. Eight (8) credits. Pre-requisites: ORTO 9101, ORTO 9102, ORTO 9103, ORTO 9104, ORTO 9105, ORTO 9106,ORTO 9107, ORTO 9201, ORTO 9202, ORTO 9203, ORTO 9205, ORTO 9206, ORTO 9207, ORTO 9208. Co-requisites: ORTO 9301, ORTO 9304, ORTO 9307, ORTO 9308.
This course is designed to expose the postgraduate students to clinical experiences in this specialty area. It provides the opportunity to learn from different clinical cases which students are expected to diagnose, treat, and follow-up for the following two years. The use of fixed edgewise, extraoral removable, functional, and retentive appliances is emphasized. The student should develop analytical biomechanical and motor skills as they apply specifically to Orthodontics. A higher level of proficiency and greater independence levels are expected in this course as compared to ORTO 9203. Grading System: Passed (P), Fail (F)

ORTO 9304 - Craniofacial Anomalies Seminar I. Two (2) credits. Pre-requisites: ORTO 9101 to 9107, ORTO 9201 to 9203, ORTO 9205 to 9208. Co-requisites: ORTO 9301, 9303, 9307, 9308.
This course is designed to train the Orthodontic graduate resident in the diagnosis, treatment planning, and clinical management of patients undergoing orthognathic or craniofacial surgery. A broad variety of lectures covering the most important aspects of surgical orthodontics including its multidisciplinary management will be presented. Readings will be assigned for each lecture, and the residents will actively participate during the presentation. Seminars and interdisciplinary staffing concerning congenital malformations of the jaws with particular emphasis placed on congenital clefts of the lip and palate, craniofacial syndromes and orthognathic surgery cases will be presented. The embryology, etiology, and morphology of congenital facial malformations will be discussed. Post natal growth problems and associated complications in respiration, deglutition, mastication, and speech will be studied. Longitudinal growth studies will be presented revealing growth, developmental, and functional changes. Treatment modalities and outcomes will be critically evaluated. Grading System: Passed (P), Fail (F)

ORTO 9307 - Case Presentation Seminar III. Two (2) credits. Pre-requisites: ORTO 9101 to ORTO 9107, ORTO 9201 to ORTO 9203, ORTO 9205 to ORTO 9208. Co-requisites: ORTO 9301, ORTO 9303, ORTO 9304, ORTO 9308.
During the sessions, the resident will present their clinical cases to the clinical instructor responsible for the clinic on that day. All diagnostic records will be thoroughly evaluated and treatment plan will be developed to address the clinical problems presented on each case. The residents will be examined in their knowledge on diagnosis and treatment planning, scientific literature, treatment modalities, and orthodontic appliances. Based on this experience the resident will be exposed to different treatment alternatives and will develop a sense of clinical judgement based on a multidisciplinary approach. Grading System: Passed (P), Fail (F)

ORTO 9308 - Orthodontic Interdisciplinary Seminar II. Two (2) credits. Pre-requisites: ORTO 9101 to ORTO 9107, ORTO 9201 to ORTO 9203, ORTO 9205 to ORTO 9208. Co-requisites: ORTO 9301, ORTO 9303, ORTO 9304, ORTO 9307.
This course is designed to train the Orthodontic graduate residents to evaluate all the dental aspects that need to be taken into consideration before the diagnosis and treatment planning of a case. A broad variety of lectures reviewing the important aspects of the clinical areas of Periodontics, Endodontics, and Prosthodontics, implants, occlusion and TMJ and their interrelationship with orthodontic treatment will be presented. Readings will be assigned for each lectures and the resident will actively participate during the presentation. Seminars with interdisciplinary staffing will be conducted where emphasis will be placed on the early diagnosis and detection of dental problems that will affect the orthodontic treatment and the adequate treatment sequence that should be followed. Each resident is responsible for presenting a clinical case that requires the multidisciplinary approach. Grading System: Passed (P), Fail (F)

ORTO 9401 - Orthodontic Literature Review IV. Two (2) credits. Pre-requisites: ORTO 9103, ORTO 9303, ORTO 9304, ORTO 9307, ORTO 9308. Co-requisites: ORTO 9403, ORTO 9404, ORTO 9407, ORTO 9408.
This is a course in which the graduate Orthodontic student will be responsible for obtaining from the library or any other resource, reading critically, evaluating and presenting to the faculty and their peers a broad range of scientific articles, dealing with or associated to the art and science of Orthodontics. These articles will be directly related to and complementary with the subject matter of the other orthodontic courses taken during each semester.

ORTO 9403 - Orthodontic Post Graduate Clinic IV. Eight (8) credits. Pre-requisites: ORTO 9103, ORTO 9303, ORTO 9304, ORTO 9307, ORTO 9308. Co-requisites: ORTO 9401, ORTO 9404, ORTO 9407, ORTO 9408.
This course is designed to expose the post-graduate Orthodontic students to clinical experiences in this specialty area. It provides the opportunity to learn from different clinical cases which students are expected to diagnose, treat and follow-up for the following 1.5 years. The use fixed edgewise, extraoral removable, functional and retentive appliances is emphasized. The student should develop analytical biomechanical and motor skills as they apply specifically to Orthodontics. A higher level of proficiency and greater independence level is expected in this course as compared to Orthodontic Post-Graduate Clinic III (ORTO 9303). Grading System: Passed (P), Fail (F)

ORTO 9404 - Craniofacial Anomalies Seminar II. Two (2) credits. Pre-requisites: ORTO 9103, ORTO 9303, ORTO 9304, ORTO 9307, ORTO 9308. Co-requisites: ORTO 9401, ORTO 9403, ORTO 9407, ORTO 9408.
This course is designed to train the Orthodontic graduate resident in the diagnosis, treatment planning and clinical management of patients undergoing orthognathic or craniofacial surgery. A broad variety of lectures covering the most important aspects of surgical Orthodontics including its multidisciplinary management will be presented. Readings will be assigned for each lecture and the residents will actively participate during the presentation. Seminars and interdisciplinary staffing concerning congenital malformations of the jaws with particular emphasis placed on congenital clefts of the lip and palate, craniofacial syndromes and orthognathic surgery cases will be presented. The embryology, etiology and morphology of congenital facial malformations

will be discussed. Post natal growth problems and associated complications in respiration, deglutition, mastication and speech will be studied. Longitudinal growth studies will be presented revealing growth, developmental and functional changes. Treatment modalities and outcomes will be critically evaluated. Grading System: Passed (P), Fail (F)

ORTO 9407 - Case Presentation Seminar IV. Two (2) credits. Pre-requisites: ORTO 9103, ORTO 9303, ORTO 9304, ORTO 9307, ORTO 9308. Co-requisites: ORTO 9401, ORTO 9403, ORTO 9404, ORTO 9408.
During the sessions, the residents will present their clinical cases to the clinical instructor responsible for the clinic on that day. All diagnostic records will be thoroughly evaluated and treatment plan will be developed to address the clinical problems presented on each case. The residents will be examined in their knowledge on diagnosis and treatment planning, scientific literature, treatment modalities and orthodontic appliances. Based on this experience the resident will be exposed to different treatment alternatives and will develop a sense of clinical judgment based on a multidisciplinary approach. Grading System: Passed (P), Fail (F)

ORTO 9408 - Orthodontic Interdisciplinary Seminar III. Two (2) credits. Pre-requisites: ORTO 9103, ORTO 9303, ORTO 9304, ORTO 9307, ORTO 9308. Co-requisites: ORTO 9401, ORTO 9403, ORTO 9404, ORTO 9407.
This course is designed to expose the residents to a variety of topics related to the clinical, legal and practical aspects in the field of Orthodontics. A broad variety of lectures covering the topics of Radiology, Arthroscopy, Pharmacology, Dental Emergencies, Psychological Effects of Dental Malocclusion, Infection Control, Total Quality, Ethics, Jurisprudence and Practice Management will be presented. In addition, readings will be assigned for the lectures and the residents will actively participate during the presentation. This course will enable the residents to integrate all the different aspects in the management of an orthodontic case, not only clinically but also medicolegally and ethically. Also, with this course the residents will be aware of what to expect in private practice scenario. Grading System: Passed (P), Fail (F)

ORTO 9501 - Orthodontic Literature Review V. Two (2) credits. Pre-requisites: ORTO 9401, ORTO 9403, ORTO 9404, ORTO 9407, ORTO 9408. Co-requisites: ORTO 9503, ORTO 9507, ORTO 9508.
This is a course in which the graduate Orthodontic student will be responsible for obtaining from the library or any other resource, reading critically, evaluating and presenting to the faculty and their peers a broad range of scientific articles, dealing with or associated to the art and science of Orthodontics. These articles will be directly related to and complementary with the subject matter of the other orthodontic course taken during each semester.

ORTO 9503 - Orthodontic Post Graduate Clinic V. Eight (8) credits. Pre-requisites: ORTO 9401, ORTO 9403, ORTO 9404, ORTO 9407, ORTO 9408. Co-requisites: ORTO 9501, ORTO 9507, ORTO 9508.
This course is designed to expose the post-graduate Orthodontic students to clinical experience in this specialty area. It provides the opportunity to learn from different clinical cases which students are expected to diagnose, treat and follow-up for the following year. The use of fixed edgewise, extraoral, functional and retentive appliances is emphasized. The student should develop analytical biomechanical and motor skills as they apply specially to Orthodontics. A higher level of proficiency and greater independence level is expected in this course as compared to Orthodontics Post-Graduate Clinic IV (ORTO 9403). Grading System: Passed (P), Fail (F)

ORTO 9507 - Case Presentation Seminar V. Two (2) credits. Pre-requisites: ORTO 9401, ORTO 9403, ORTO 9404, ORTO 9407, ORTO 9408. Co-requisites: ORTO 9501, ORTO 9503, ORTO 9508.
During the sessions, the residents will present their clinical cases to the clinical instructor responsible for the clinic on that day. All diagnostic records will be thoroughly evaluated and treatment plan will be developed to address the clinical problems presented on each case. The residents will be examined in their knowledge on diagnosis and treatment planning, scientific literature, treatment modalities and orthodontics appliances.

Based on this experience the resident will be exposed to different treatment alternatives and will develop a sense of clinical judgment based on a multidisciplinary approach. Grading System: Passed (P), Fail (F)

ORTO 9508 - Orthodontic Interdisciplinary Seminar IV. Two (2) credits. Pre-requisites: ORTO 9401, ORTO 9403, ORTO 9404, ORTO 9407, ORTO 9408. Co-requisites: ORTO 9501, ORTO 9503, ORTO 9507.
This is a course in which the resident will be exposed to a variety of topics related to the administrative, management and marketing aspects of an Orthodontic Office. A broad variety of topics such as Office Layout and Dental Equipment, Human Resources, Labor Laws, Computer Systems, Dental Insurances, Property Insurances, Investments, Disability Insurance, Accounting, Practice Management, Marketing and Public Health will be discussed. Guest experts on each topic will be invited. This course will enable the residents to be exposed to administrative considerations in establishing an office. Other alternatives such as buying in or out and partnerships will also be explored so that the resident can make an educated decision in terms of the alternatives available to practice Orthodontics. Grading System: Passed (P), Fail (F)

ORTO 9601 - Orthodontic Literature Review VI. Two (2) credits. Pre-requisites: ORTO 9501, ORTO 9503, ORTO 9507, ORTO 9508. Co-requisites: ORTO 9603, ORTO 9611.
This is a course in which the graduate Orthodontic student will be responsible for obtaining from the library or any other resource, reading critically, evaluating and presenting to the faculty and their peers a broad range of scientific articles, dealing with or associated to the art and science of Orthodontics. These articles will be directly related to and complementary with the subject matter of the other orthodontic course taken during each semester.

ORTO 9603 - Post Graduate Orthodontic Clinic VI. Eight (8) credits. Pre-requisites: ORTO 9501, ORTO 9503, ORTO 9507, ORTO 9508. Co-requisites: ORTO 9601, ORTO 9611.
This course is designed to expose the post-graduate students to clinical experience in this specialty area. It provides the opportunity to learn from different clinical cases which students are expected to diagnose, treat and follow-up for the following semester. The use of fixed edgewise, extraoral, removable, functional and retentive appliances is emphasized. The student should develop analytical biomechanical and motor skill as they apply specifically to Orthodontics. Grading System: Passed (P), Fail (F)

PDOC 9000 - Thesis. Eight (8) credits. Pre-requisites: PDOC 9006, PDOC 9101, PDOC 9102.
This course is designed for the post doctoral student at the School of Dental Medicine to prepare a research project to obtain a Master in Sciences in Dentistry. It is conducted as an independent study under the supervision of a thesis committee. Grading System: Honor (H), Satisfactory (S), Not Passed (NP)

PDOC 9005 - Statistical Analysis Applied to the Dental Sciences. Three (3) credits.
Pre-requisite: PEDO 9436.
The aim of this course is to develop the skills for analysis and interpretation of scientific research data of the Postdoctoral Program graduates. It enables the resident to conduct data analysis through descriptive statistics and to test research hypothesis. The course meets twice a week in two hours sessions. The strategies used include lectures, demonstrations, and exercises using statistical packages in computers.

PDOC 9006 - Research Methods and Applied Statistics for Dental Residents. Five (5) credits.
The course is designed for post-doctorate (residents) in Dentistry. It focuses on basic concepts of oral health research, study design and planning, statistical analysis for various types of research studies, as well as basics of hypothesis testing and statistical inference. This course is conducted by means of lectures, discussions, and computer lab sessions.

PDOC 9101 - Introduction to Research Planning. Two (2) credits. Pre-requisites: PDOC 9006.
This course is designed for the post doctoral student (resident) to complete a literature review and write an outline of the methods to be employed for a research project on a topic related to oral health. The course will be conducted by means of discussions and presentations of students' work.

PDOC 9102 - Research Planning and Statistical Design. Three (3) credits. Pre-requisites: PDOC 9101.
This course is designed for the post-doctorate student (resident) to complete the methods and statistical design section of a research proposal. This course will be conducted by means of discussions and presentations of students' work. Grading System: Honor (H), Satisfactory (S), Not Passed (NP)

PDOC 9103 - Research Project I. Two (2) credits. Pre-requisites: PDOC 9101.
This course is designed for the post doctoral student (resident) to complete data collection and preliminary analysis for a pilot research project. It is conducted as a group or individual study under the supervision of a research mentor. Grading System: Honor (H), Satisfactory (S), Not Passed (NP)

PDOC 9104 - Research Project II. Two (2) credits. Pre-requisites: PDOC 9103.
This course is designed for the post-doctorate student (resident) to complete the data analysis of a research project and prepare a manuscript on a topic related to oral health. It is conducted as a group or individual independent study under the supervision of a research mentor. Grading System: Honor (H), Satisfactory (S), Not Passed (NP)

PEDO 6560 - Statistical Inference in Dentistry. Three (3) credits. Pre-requisites: PEDO 9436, PEDO 9455.
This course devotes the first half to theoretical considerations relevant to the inferential process. It goes then to the critical interpretation of results from computerized analyses in the testing of hypothesis through varied statistical procedures ("T" tests for one and for two tails, with means and percentages; Chi-Square tests; regression analyses, etc.). The procedures for testing hypothesis are conducted in contexts directly relevant to Dentistry. The critical analysis always culminates with a discussion on the inferential implications of the results. The course covers the basic concepts in probability; the theory relevant to sampling, including the sampling distribution as a theoretical concept; and the most commonly applied distributions (normal curve, the Binomial distribution, the Poisson distribution, the Chi-Square distribution). Tests of hypothesis are conducted with data relevant to Dentistry, in order to affirm the above mentioned concepts. Extensive use is made of presentations by the students in a seminar approach that integrates the practice to the theory.

PEDO 9400 - Advanced Pediatric Dentistry Seminar. Two (2) credits.
The content and activities in this course are intended to bring the student above the level of the general practitioner in his knowledge and skills in the diagnosis and treatment planning for the usual and the bizarre oral disorders encountered in children. The content is more specifically oriented to the detection and treatment of conditions affecting the primary and young permanent dentition, such as dental caries, developmental anomalies, and traumatic injuries.

PEDO 9402 - Advanced Pediatric Dentistry. Two (2) credits.
This is a continuation of course PEDO 9401 at a more advanced level.

PEDO 9404 - Interceptive Orthodontics Seminar. Two (2) credits.
This is a continuation of course PeInstruction in Interceptive Orthodontic is intended to develop a knowledge of the fundamental processes of growth and development of the craniofacial complex and understanding of the science of cephalometrics and biomechanical principles applied to the procedures commonly used in the interceptive treatment of malocclusion.

PEDO 9405 - Interceptive Orthodontic Seminar. One (1) credit.
This is a continuation of course PEDO 9404. Instruction in Interceptive Orthodontic is intended to develop a knowledge of the fundamental processes of growth and development of the craniofacial complex and understanding of the science of cephalometrics and biomechanical principles applied to the procedures commonly used in the interceptive treatment of malocclusion.

PEDO 9406 - Interceptive Orthodontic Seminar. One (1) credit.
This is a continuation of course PEDO 9405. Instruction in Interceptive Orthodontic is intended to develop a knowledge of the fundamental processes of growth and development of the craniofacial complex and understanding of the science of cephalometrics and biomechanical principles applied to the procedures commonly used in the interceptive treatment of malocclusion.

PEDO 9407 - Anesthesiology Clerkship. Two (2) credits.
The Clerkship in Anesthesiology for residents in Pedodontics has been designed to teach these specialists some basic principles of General Anesthesia. Residents will have the opportunity to develop some skill in the administration of anesthetics and to expand their general medical knowledge of application in Anesthesiology, pre and postanesthetic management with particular emphasis to the pediatric patient. It will give the resident the opportunity to recognize, understand, and possible manage (if the need arises) some of the problems that occur during the administration of Anesthesia for oral-denture procedures.

PEDO 9408 - Advanced Pediatric Dentistry Clinic. Three (3) credits.
The experience and activities in this clinical course are intended to develop in the student skill in the management, diagnosis, and dental treatment of children. Patients are selected to provide the student with a variety of experiences including routine and special procedures such as, those encountered in patients with developmental anomalies of the teeth. Different age groups are also included in this selection in order that the student become associated with the variations in behavior encountered and their management in the Dental Office. A total of twenty patients are required to rendered.

PEDO 9409 - Advanced Pediatric Dentistry Clinic. Three (3) credits. Pre-requisite: PEDO 9408.
The experiences and activities in the clinical course are intended to develop in the student skill in the management, diagnosis, and dental treatment of children. Patients are selected to provide the student with a variety of experiences, including routine and special clinical procedures such as those encountered in patients with developmental anomalies of the teeth. Different age groups are also included in this selection in order that the student become associated with the variations in behavior encountered and their management in the Dental Office. This is a continuation of course PEDO 9408.

PEDO 9410 - Advanced Pediatric Dentistry Clinic. Two (2) credits.
This is a continuation of course PEDO 9408. The experiences and activities in this clinical course are intended to develop in the student skill in the management, diagnosis, and dental treatment of children. Patients are selected to provide the student with a variety of experiences including routine and special procedures such as those encountered in patients with developmental anomalies of the teeth. Different age groups are also included in this selection in order that the student become associated with the variations in behavior encountered and their management in the Dental Office. A total of twenty patients are required.

PEDO 9411 - Special Pediatric Dentistry Clinic. Two (2) credits.
This clinical course is designed to give graduate students of Pediatric Dentistry the opportunity to master competencies in the management of special patients and in all aspects of hospital procedures. The Puerto Rico Medical Center Children's Dental Clinic and the Pediatric Hospital Dental Clinic will be the main workshop for the treatment of handicapping conditions.

PEDO 9412 - Special Pediatric Dentistry Clinic. Three (3) credits. Pre-requisite: PEDO 9411.
This clinical course is designed to give the graduate students of Pediatric Dentistry the opportunity to master competencies in the management of special patients and in all aspects of hospital procedures. The Puerto Rico Medical Center Children's Dental Clinic and the Pediatric Hospital Dental Clinic will be the main workshop for the treatment handicapped patients. This is a continuation of course PEDO 9411.

PEDO 9413 - Special Pediatric Dentistry Clinic. Two (2) credits.
This course is a continuation of course PEDO 9412. This clinical course is designed to give the graduate students of Pediatric Dentistry the opportunity to master competencies in the management of special patients and in all aspects of hospital procedures. The Puerto Rico Medical Center Children's Dental Clinic and the Pediatric Hospital Dental Clinic will be the main workshop for the treatment of handicapped patients.

PEDO 9414 – Children with Special Health Care Needs. Four (4) credits.
This course involves the formal study of children's developmental disabilities, their etiology, diagnosis, and treatment. It also includes the study of physical, systemic, and behavioral disorders that are commonly encountered in children and adult patients that require special attention by the dentist. Emphasis is also given to the adjustments made in the treatment plan employed in the management of these patients.

PEDO 9416 - Dental Education. Two (2) credits.
The course is designed to equip potential candidates for teaching in Dental Schools with the basic pedagogical knowledge and skills that are necessary for effective teaching. The course is also opened to faculty members. The philosophy, objectives, and the curriculum for the preparation of dentists are studied with emphasis in the following topics: Pedagogical Principles and their Applications for Teaching in the Dental School; Teaching Methodology in Didactic Course, The Laboratory, and the Clinic, Selection and Utilization of Media; Individualization of Instruction; Evaluation of Student's Progress; Planning for Instruction and Content Organization at Various Levels. The methodology of the course includes lectures, discussion, use of audiovisual materials, presentation of topics by students, and actual teaching and projects performed by students.

PEDO 9419 - Advanced Pediatric Dentistry Clinic. Two (2) credits.
This is a continuation of course PEDO 9410. The experiences and activities in this clinical course are intended for the development of skills in the management, diagnosis, and dental treatment of children. Patients are selected to provide the student with a variety of experiences, including routine and special clinical procedures such as those of the teeth. Different age groups are also included in this selection in order that the student become associated with the variation in behavior encountered and their management in the Dental Office. A total of twenty patients are required and they must be rendered a comprehensive oral treatment.

PEDO 9420 - Advanced Pediatric Dentistry Clinic. Two (2) credits.
This course is a continuation of course PEDO 9419. The experiences and activities in this clinical course are intended for the development of skills in the management, diagnosis, and dental treatment of children. Patients are selected to provide the student with a variety of experiences, including routine and special clinical procedures such as those encountered in patients with developmental anomalies of the teeth. Different age groups are also included in this selection in order that the student become associated with the variation in behavior encountered and their management in the Dental Office. A total of twenty patients are requested to rendered a comprehensive oral treatment.

PEDO 9421 - Advanced Pediatric Dentistry Clinic. Two (2) credits.
This is a continuation of course PEDO 9420. The experiences and activities in this clinical course are intended for the development of skills in the management, diagnosis, and dental treatment of children. Patients are selected to provide the student with a variety of experiences, including routine and special clinical procedures

such as those encountered in patients with developmental anomalies of the teeth. Different age groups are also included in this selection in order that the student become associated with the variation in behavior encountered and their management in the Dental Office. A total of twenty patients are required and they must be rendered a comprehensive oral treatment.

PEDO 9422 - Interceptive Orthodontics Clinic. One (1) credit.
Instruction in Interceptive Orthodontic is intended to establish an understanding of the fundamental processes of growth and development of the craneofacial complex to serve as basis for comprehensive evaluation of developing malocclusion. Special attention will also be given to mixed dentition analysis techniques, serial extraction, myofunctional therapy, contributory oral habits, tissue changes incidental to tooth movement, dental and skeletal ages analysis, growth prediction and eruption guidance.

PEDO 9423 - Interceptive Orthodontics Clinic. One (1) credit. Pre-requisite: PEDO 9422
Instruction in Interceptive Orthodontic is intended to establish an understanding of the fundamental processes of growth and development of the craneofacial complex to serve as basis for comprehensive evaluation of developing malocclusion. Special attention will also be given to mixed dentition analysis techniques, serial extraction, myofunctional therapy, contributory oral habits, tissue changes incidental to tooth movement, dental materials in the orthodontic practice, dental and skeletal ages analysis, growth prediction and eruption guidance.

PEDO 9424 - Interceptive Orthodontics Clinic. Two (2) credits. Pre-requisite: PEDO 9422, PEDO 9423
Introduction in Interceptive Orthodontic is intended to establish an understanding of the fundamental processes of growth and development of the craneofacial complex to serve as basis for comprehensive evaluation of developing malocclusion. Special attention will be given to mixed dentition analysis techniques, serial extraction, myofunctional therapy, contributory oral habits, tissue changes incidental to tooth movement, dental skeletal ages analysis, growth prediction and eruption guidance.

PEDO 9425 - Special Pediatric Dentistry Clinic. Two to five (2-5) credits.
This clinical course is designed for the graduate students of Pediatric Dentistry to master competencies in the management of special patients and in all aspects of hospital procedures. The Puerto Rico Medical Center Children's Dental Clinic and the Pediatric Hospital Dental Clinic will be the main workshop for the treatment of handicapping conditions.

PEDO 9426 - Special Pediatric Dentistry Clinic. Two to five (2-5) credits.
This course is a continuation of course PEDO 9425. The clinical course is designed for the graduate students of Pediatric Dentistry to master competencies in the management of special patients and all aspects of hospital procedures. The Puerto Rico Medical Center Children's Dental Clinic and the Pediatric Hospital Dental Clinic will be the main workshop for the treatment of handicapping conditions.

PEDO 9427 - Special Pediatric Dentistry Clinic. Two to five (2-5) credits.
This course is a continuation of course PEDO 9426. This clinical course is designed for the graduate students of Pediatric Dentistry to master competencies in the management of special patients and in all aspects of hospital procedures. The Puerto Rico Medical Center Children's Dental Clinic will be the main workshop for the treatment of handicapping conditions.

PEDO 9428 - Evidence Based Pediatric Dentistry. Two (2) credits.
This course is designed to review literature that addresses contemporary issues in the practice of Pediatric Dentistry. The course builds up on the foundation of the first-year courses that have already covered all the classic and relevant topics of Pediatric Dentistry. Hence, the focus is more directed into preparing the second year student/resident to address issues with private practice in mind. Strong emphasis is given to

professionalism, ethics, legal aspects, practice management and emerging issues. Moderators will be brought from the Pediatric Dentistry local community along with the course coordinator. Literature reviews is to be applied. Knowledge acquired through the literature should be applied to practice, presentations and oral clinical examinations.

PEDO 9429 - Research Pediatric Dentistry. Four (4) credits.

PEDO 9434 - Interceptive Orthodontics Clinic. One to four (1-4) credit(s).
Instruction in Interceptive Orthodontics is intended to develop a knowledge of the fundamental processes of growth and development of the craneofacial complex and understanding of the science of Cephalometrics and biomechanical principles applying to those procedures commonly used in the interceptive treatment of malocclusion. Special attention will be also given to mixed dentition analysis techniques, serial extraction, myofunctional therapy, contributory oral habits, tissue changes incidental to tooth movement, dental material in the orthodontic practice and dental and skeletal age analysis.

PEDO 9435 - Interceptive Orthodontics Clinic. One to four (1-4) credit(s).
This course is a continuation of course PEDO 9434. Instruction in Interceptive Orthodontics is intended to develop a knowledge of the fundamental processes of growth and development of the craneofacial complex, and understanding of the science of Cephalometrics and biomechanical principles applied to the procedures commonly used in the interceptive treatment of malocclusion. Special attention will be also given to mixed dentition analysis techniques, serial extraction, myofunctional therapy, contributory oral habits, tissue changes incidental to tooth movement, dental materials in the orthodontic practice, dental and skeletal age analysis.

PEDO 9436 - Research Methods for Residents. Two (2) credits.
This course is designed to familiarize the resident student with the process of designing, planning a research project, develop the library, and writing skills necessary for the preparation of a research proposal. The course will also allow the student to experience the actual doing of the project; develop the necessary research gathering analysis, interpretation and writing involved in the performing and reporting phases of a research project.

PEDO 9437 - Human Growth and Development. One (1) credit.
This course has been designed to offer the professional graduated in the area of Pedodontic a general review of the theory and clinical practice, and of the knowledge that is required to understand normal growth and development of infants, children and adolescents in its multiple aspects: physical, metabolic, bone and organs. Factors affecting development at different stages, from conception to maturity will also be analyzed. The course will consist of the oral presentation and analysis of assigned reading material. The material to be assigned is intended to help the professional develop an overall knowledge on human growth and development as well as to help him apply these knowledge on his daily involvement with his patients, including diagnosis.

PEDO 9439 - Pediatric Physical Diagnosis. Three (3) credits.
It covers the art and science of taking a good history, making a comprehensive physical examination, and arriving at a pertinent diagnosis. Emphasis is placed on the Cardio-Pulmonary System.

PEDO 9445 - Pediatric Oral Pathology. Two (2) credits.
The dentist who treats children should be proficient in the congenital and acquired pathological conditions that are most prevalent in the early life of the individual. Common conditions, as well as less frequent diseases, including endocrinologic and genetic problems are thoroughly discussed from the standpoint of

clinical features, etiology, radiographic, and histological characteristics where applicable, pertinent laboratory tests and prognosis.

PEDO 9446 - Baby Bottle Tooth Decay Outreach Program. Three (3) credits.
This course is designed to teach graduates the concepts associated with early childhood caries (ECC), not only from the dental standpoint but with is association to socioeconomical factors. The student through lectures, seminars and field work will be able to understand how disparities in certain groups can become a leading cause of the development of early childhood caries. Through the understanding of this converging factors and the analysis of group composition, graduates will create an outreach program, culturally sensitive, that will assist the community in the prevention of oral disease. Grading System: Passed (P), Not Passed (NP)

PEDO 9447 - Community Oral Health. Three (3) credits.
The aim of this elective course is to provide our graduates the basics of Dental Public Health and the skills necessary to implement community based oral health prevention programs. The course will be conducted using lectures and fieldwork. Students will identify such target areas and programs that can be implemented in order to impact and improve community oral health. It is based largely on the needs of the community that will be assessed first. Efforts will be focused on population needs, in accordance to what is socially appropriate and culturally sensitive. The course is elective and is divided in two areas: the didactic component introduces to general aspects of Dental Public Health. The Second Part is dedicated to raise the data that sensibly will give us a clear picture of the problems of the community related to dental disease. Students will be required to visit the field community and be away from the Medical Sciences Campus for at least two hours. Grading System: Passed (P), Not Passed (NP)

PEDO 9449 - Pediatric Medicine Rotation. Zero (0) credits. Pre-requisites: PEDO 9439.
This course is designed to help the student/resident become familiar with the common protocols for treatment of the common systemic conditions and management procedures designed to prevent or quickly address pediatric medical illness. Dentists need to be trained in the diagnosis and management of these medically compromised conditions in order to arrive at proper assessments with this growing population at their dental practices. Grading System: Passed (P), Not Passed (NP)

PERI 9100 - Oral Medicine, Oral Pathology and Diagnostic Skills. Two (2) credits.
This course aims for the first-year master's student in periodontology to integrate knowledge from oral medicine and oral pathology to develop their diagnostic skills. During the course each lecture is followed by the discussion of a case based clinical pathologic correlation to encourage students rational thinking in order to achieve a workable differential diagnosis. Through lectures, case-based studies, problem-based learning, and group discussions students have the opportunity to increase their diagnostic acumen, knowledge of disease treatment, disease prognosis as well as criteria or parameters for patient referral to appropriate medical or dental specialist. The course will be delivered in face-to-face mode.

PERI 9101 - Classic Periodontal Literature Seminar I. Two (2) credits.
In this course, fundamental for the interpretation of pathophysiology and the rational treatment of periodontal disease, the student will acquire basic knowledge about the different treatments that have been developed in periodontology. The first-year periodontal graduate student will be responsible for reading, critically evaluating, and presenting to faculty and peers classic scientific articles assigned for discussion thereof. Through discussion and analysis of the techniques used in the treatment of periodontal disease the student will develop the ability to evaluate advanced techniques that may arise in the future. The seminar will cover basic topics such as Anatomy of Periodontium and the Etiology, Diagnosis and Treatment of the tissues that comprise the Periodontium. The course will be delivered in face-to-face mode.

PERI 9104 - Current Periodontal Literature Seminar I. Two (2) credits.
In this course, the first-year master's student in periodontology will be responsible for reading, critically evaluating, and presenting to faculty and their peers, scientific articles from the current literature for discussion. During the seminar the student will acquire extensive knowledge about the latest treatment modalities that are being developed in Periodontics. Through the discussion and analysis of the articles it is expected that the student may develop the necessary bases to establish a rational therapy. Topics to be covered in this review include the latest diagnostic methods and treatment modalities. The course will be offered in face-to-face mode.

PERI 9120 - Periodontal Diagnosis and Treatment Planning I. Two (2) credits.
Through seminar discussions and interactive lectures, the first-year periodontal graduate student will work with the phases of diagnosis and treatment planning. During the phase of diagnosis, the latest diagnostic techniques, clinically and radiologic evaluation (Panoramic X-ray, periapical X-ray, cone beam X-ray, substraction radiography), genetics, and intersulcular fluid analysis, will be studied. The phase of treatment planning and modalities will be analyzed in detail. The primary goal of the course is to provide each student with the opportunity to critically think about each phase, practice the development of each phase, describe the progression from one phase to the next, and to be able to work independently to develop a treatment plan with an evidence-based rationale for each phase of the treatment. At the end of the year the student will be able to master a treatment plan. This course will be delivered in face-to-face mode.

PERI 9121 - Periodontal Lecture Series I. Two (2) credits.
This course is designed to introduce the first-year master's student in periodontology to pertinent didactic information on periodontal therapy. Through seminars, presentations, and faculty interactive lectures is expected that the student will be able to discuss different aspects of periodontology, emphasizing diagnosis, therapy and pathology. Topics, such as: anatomy of the periodontium, cell and molecular biology, epidemiology and etiology, diagnosis, prevention, treatment, maintenance, and outcome assessment, among others, will also be discussed. At the end of this course the student will be able to master a treatment plan. This course will be offered in face-to-face mode.

PERI 9125 - Implant Dentistry for the Periodontist I. Two (2) credits.
In this course, the first-year master's student in periodontology will be introduced to pertinent clinical and didactic information on basic surgical principles for implant placement. Thorough the course the surgical protocols with strong emphasis on flap design, atraumatic flap reflection, preparation of osteotomies will be studied. Insertion of dental implants will be practice on plastic models. The student will also be exposed to simple and complex suturing techniques, and proper selection of each patient case will be discussed. At the end of the course the student will be able to master a treatment plan. The course will be delivered in face-to-face mode.

PERI 9126 - Periodontal Surgery. One (1) credit.
This course is aimed to the first-year master's student in periodontology. In this course the student will be introduced to different surgical modalities currently used in periodontology. Through interactive lectures and discussions is expected that the student will be able to understand the rationale, indications, contraindications, and applications for each surgical technique. Condition prognosis, considering the intervention with different techniques and their complications, will also be studied. The course will be delivered in face-to-face mode.

PERI 9127 - Graduate Periodontal Clinic I. Eight (8) credits.
In this face-to-face mode course, the first-year master's student in periodontology will be exposed to clinical experience in the field of periodontology including weekly rotations. It is expected that the student treats at least 25 cases with documentation including the discussion of medical history, diagnosis, treatment planning,

complete therapy and outcomes including alternatives of periodontal therapy and related dental disciplines, that suit the physical, psychological, and financial need of the patient. Diagnosis and rehabilitation of partially or completely edentulous patients with implants is required. This course fosters understanding of clinical decision-making processes and complements individualized instruction that residents receive from faculty in the clinic. Faculty supervision and demonstration of treatment will be offered.

PERI 9202 - Classic Periodontal Literature Seminar II. Two (2) credits. Pre-requisite: PERI 9101. Co-requisite: PERI 9222.
In this course the 2nd year periodontal graduate student will be responsible for reading, critically evaluate, and presents to the faculty and peers, a broad range of assigned classic scientific articles, dealing with or associated to the art and science of Periodontology, for discussion thereof. These articles will be directly related to and complementary to the Periodontal Lecture Series II course taken throughout the year. Through the analysis and discussion of these articles the resident will expand his/her knowledge about the techniques used in the treatment of periodontal disease, as well as continue developing the ability to evaluate advanced techniques that may arise in the future. The course will be delivered in face-to-face mode.

PERI 9205 - Current Periodontal Literature Seminar II. Two (2) credits. Pre-requisite: PERI 9104.
In this course, the 2nd year periodontal graduate student will be responsible for reading, critically evaluating, and presenting to the faculty and peers, scientific articles from the current literature for discussion. Through the analysis and discussion of these articles, the resident will expand his/her knowledge about the latest diagnostic methods and treatment modalities that are emerging in order to continue developing the necessary foundations to establish a ration a! therapy. The course will be offered in face-to-face mode.

PERI 9221 - Periodontal Diagnosis and Treatment Planning II. Two (2) credits. Pre-requisite: PERI 9120.
Through seminar discussions and interactive lectures, the 2nd year periodontal graduate student will continue working with the diagnosis phase which includes the latest diagnostic techniques, clinical and radiological evaluation (Panoramic X-ray, periapical X-ray, cone beam X-ray, substraction radiography), genetics and intersullary fluid analysis. In the treatment planning phase, as well as in the modalities of the treatment, the detailed analysis will be deepened. The main objective of the course is to provide each student with the opportunity to think critically about each phase, practice the development of each phase, describe the progression from one phase to the next, and be able to work independently to develop a treatment plan with an evidence-based rationale for each phase of treatment. By the end of the year the student will be able to master a treatment plan. This course will be delivered in face-to-face mode.

PERI 9222 - Periodontal Lecture Series II. Three (3) credits. Pre-requisites: PERI 9104, PERI 9121. Co-requisite: PERI 9202.
Through their direct participation in seminars, presentations, discussions, and conferences, the 2nd year periodontal graduate student is expected to gain a deeper understanding of diagnosis, therapy, and pathology in periodontics. The articles to be presented by the residents will include topics such as: anatomy of the periodontium, cellular and molecular biology, epidemiology and etiology, diagnosis, prevention, treatment, maintenance and evaluation of results, among others. These articles will be directly related to and complement the Classic Periodontal Literature Seminar 11 course. Taking this course residents are expected to be better prepared to take the American Board of Periodontology exam as well as the in-service exam offered by the American Academy of Pediatrics (AAP). This course will be offered in face-to-face mode.

PERI 9226 - Implant Dentistry for the Periodontist II. Two (2) credits. Pre-requisite: PERI 9125.
In this course, the 2nd year periodontal graduate student will continue studying the clinical and didactic information pertinent to the basic surgical principles for implant placement. During the course, surgical protocols will also continue to be studied with a strong emphasis on flap design, atraumatic flap reflection, and osteotomy preparation. The resident will have more exposure to continue practicing the insertion of

dental implants in plastic models. The resident will also expand his or her practice into simple and complex suturing techniques, and the proper selection of each patient case will be discussed. By the end of the course the resident will be able to master a treatment plan. The course will be offered in face-to-face mode.

PERI 9228 - Graduate Periodontal Clinic II. Ten (10) credits. Pre-requisite: PERI 9127.
In this supervised clinical practice course, the 2nd year periodontal graduate student will continue their clinical training in the field of periodontics. The resident is expected to treat at least 25 new cases with documentation including discussion of medical history, diagnosis, treatment planning, complete therapy, and outcomes, including periodontal therapy alternatives and related dental disciplines, that are tailored to the patient's physical, psychological, and financial needs. At this clinical level, the resident is expected to exhibit proficiency in all forms of therapy, as well as being encouraged to provide therapy for many of the various types of periodontal disease, from gingivitis to aggressive periodontal cases. Diagnosis and rehabilitation of partially or fully edentulous patients with implants is required. The course will be offered in face-to-face mode.

PERI 9230 - Occlusion. One (1) credit. Pre-requisite: PERI 9120.
This course is aimed to the 2nd year periodontal graduate student. Through seminar discussions the resident will be introduced to the temporomandibular disorders screening, jaw position to be used for the bite registration, inserting and adjusting an occlusal appliance. The course provides residents the opportunity to learn how to do occlusal equilibration. The appropriate occlusion for implants will be also reviewed in this course. Through hands-on workshops the resident will make impressions and bite registrations on their classroom partners, wax their appliances (night guards), send these to the laboratory for processing, and insert them on their classroom partners.

PERI 9303 - Classic Periodontal Literature Seminar III. Two (2) credits. Pre-requisite: PERI 9202.
In this course, the third-year graduate student will be responsible for conducting a thorough literature review on the topic of classical periodontics. Each student will be assigned a wide range of classic scientific papers, related to the art and science of Periodontics; who must read, critically evaluate, synthesize, and prepare a presentation to present to the faculty and their classmates the results of the critical analysis carried out. Students will meet in a round table where they will share the learning acquired from a dialectical perspective. Through interactive presentations and discussions based on the classic literature studied, students are expected to acquire a deeper knowledge about the techniques used in periodontal treatment that they could apply in their clinical practice experience; and refine their ability to evaluate advanced techniques that emerge later. The course will be offered in face-to-face mode.

PERI 9306 - Current Periodontal Literature Seminar III. Two (2) credits. Pre-requisite: PERI 9205.
This course is aimed at the third-year graduate student and focuses mainly on the review and understanding of the updated literature on the current diagnostic methods and treatment modalities in the practice of surgical sciences in periodontology. Each student will carry out a critical analysis of the assigned scientific articles and will prepare a presentation that will be presented to the faculty and their classmates in a round table. Through the group discussions generated in the presentation of the articles, students will have the opportunity to share the learning acquired. In this way, students are expected to achieve extensive knowledge about the latest treatment modalities that are being developed in Periodontics with the purpose of applying it in their clinical practice experience and thus substantiate the rationale of treatment. The course will be offered in face-to-face mode.

PERI 9322 - Periodontal Diagnosis and Treatment Planning III. Two (2) credits. Pre-requisite: PERI 9221.
In this course, the third-year graduate student will continue to critically analyzing and practice the phases of periodontal evaluation, diagnosis, and treatment, as well as describe the progression of each phase. In addition, through group discussions and interactive lectures, students will have the opportunity to expand

their knowledge on topics about the latest diagnostic, clinical and radiological evaluation techniques including: the use of panoramic X-rays, periapical X-rays, subtraction radiography, cone beam X-rays, genetics and intrasulcular fluid analysis. With special emphasis the planning and modalities of treatment will also be discussed. At the end of the course, the student is expected to develop a treatment plan independently. The course will be offered in face-to-face mode.

PERI 9323 - Periodontal Lecture Series III. Two (2) credits. Pre-requisite: PERI 9222.
In this course, the third-year graduate student will be responsible for the learning experience from a dialectical perspective. Through seminars, group discussions, and interactive lectures, various scientific articles associated with important aspects of Periodontics and directly related to the topics offered in the courses that are part of the Program's curriculum, will be analyzed and discussed. Among the topics to be discussed are: periodontal anatomy, cellular and molecular biology, epidemiology and etiology, diagnosis, prevention, treatment, maintenance and evaluation of results. Students will apply acquired knowledge in their clinical practice experience. Upon completion of the course, the student is expected to possess the knowledge and skills necessary to approve the in-service examination of the American Academy of Periodontology (AAP) and the American Board of Periodontology. This course will be offered in face-to-face mode.

PERI 9327 - Implant Dentistry for the Periodontist III. Two (2) credits. Pre-requisite: PERI 9226.
In this course, the third-year graduate student will develop advanced clinical management skills based on scientific evidence in the principles of dental implant placement. Surgical protocols will be worked with emphasis on flap design, atraumatic flap reflection, osteotomy preparation and dental implant insertion in more complex clinical cases. The student will utilize the knowledge acquired in previous courses on dental implants for the proper management of these cases. The third-year resident will have the opportunity to apply simple and complex suturing techniques, as required on the case of the patient being cared by the resident. This course will be delivered in face-to-face modality.

PERI 9329 - Graduate Periodontal Clinic III. Ten (10) credits. Pre-requisite: PERI 9228.
In this course the third-year graduate student is expected to provide clinical services at least 25 new cases. At the same time, the student must document the discussion of medical history, diagnosis, treatment planning, complete therapy, and outcomes. Likewise, it must include the alternatives of periodontal therapy, rehabilitation of partially or totally edentulous patients with implants, as well as related dental disciplines, which adapt to the physical, psychological and economic needs of the patient. The course enables students to provide therapy to various types of periodontal diseases, e.g., gingivitis, aggressive periodontal cases, and others. At the end of the course, the student must demonstrate mastery of the skills acquired in the various periodontal therapies implemented. The course will be face-to-face.

PERI 9340 - Clinical Supervision Rotation. One (1) credit. Pre-requisite: PERI 9228.
In this course, the third-year graduate student will participate as a clinical instructor of periodontic patients as part of the evaluation. This clinical experience and supervision are a unique intervention process, which focuses on the professional identity and skill development of the supervised student. The focus of the course is aimed at developing a working alliance of quality supervision, conceptualization skills, evaluation, teaching and consultation skills, as well as developing skills in both group and individual supervision modalities. The theoretical bases of supervision will also be embroidered, as well as feedback techniques for supervised students. At the end of the course, the student is expected to demonstrate the professional competencies associated with discipline. The course will be offered in face-to-face modality.

PHAR 8515 - Pharmacology and Therapeutics. Two (2) credits.
This is a seminar course offered to graduate students of the School of Dentistry. It covers areas of special interest to the dentist, for example, local anesthetics, antibiotics, analgesics, fluoride and corticosteroids.

The student, with the help of the instructor, searches the literature for the latest information on the subject assigned. Preparation of the seminar stresses pharmacological actions, side effects, and toxicology and applications in dentistry. A presentation is made by the student followed by discussion and questions.

PROG 9100 - Anesthesiology Rotation. Four (4) credits.

This course consists of three (3) weeks rotation through the Anesthesiology Department. During this time the general practice resident will assume all the duties and responsibilities of a First Year Anesthesiology Resident.

PROG 9101 - Patient Care Clinic. Two (2) credits.

Provide experiences to improve the competence and confidence of the graduate in the various clinical disciplines, which are integral components of General Dentistry.

PROG 9102 - Patient Care Clinic. Two (2) credits. Pre-requisite: PROG 9101.

Provide experience to improve the competence and confidence of the graduate in the various clinical disciplines, which are integral components of General Dentistry.

PROG 9105 - Oral and Maxillofacial Surgery Clinic. Two (2) credits.

This course provides practical experience in Oral and Maxillofacial Surgery in both ambulatory and hospitalized patients. The student will work in the Oral and Maxillofacial Surgery Clinic at the hospital, with emphasis in performing those procedures within the purview of a generalist.

PROG 9106 - Hospital Protocol. Two (2) credits.

Dental residents must become familiar with basic hospital protocol, especially that common to all hospitals.

PROG 9107 - Conscious Sedation for Dental Patients. Three (3) credits.

This course will cover the available techniques to reduce apprehension in dental patients, this facilitating the performance of the operator and alleviating the tensions of the patients.

PROG 9108 - Physical Diagnosis. Three (3) credits.

This course covers the preparation of a complete medical history, the physical examination and the laboratory tests used to evaluate specific disease states of special interest to the dentist.

PROG 9111 - Comprehensive Patient Care Clinic I. Two (2) credits.

Develop in the student the knowledge, skills, and attitudes necessary to provide comprehensive dental care to his/her patients.

PROG 9112 - Comprehensive Patient Care Clinic II. Two (2) credits.

Develop in the student the knowledge, skills, and attitudes necessary to provide comprehensive dental care to his/her patients.

PROG 9113 - Clinical Sciences Seminar I. Two (2) credits.

To expose the student to the most recent literature in all fields of Dentistry and to enhance his/her capacity to critically analyze divergent points of view and to become familiar with the new trends.

PROG 9114 - Clinical Sciences Seminar II. Two (2) credits.

To expose the student to the most recent literature in all fields of Dentistry and to enhance his/her capacity to critically analyze divergent points of view and to become familiar with the new trends. A review of the latest concepts in the area of Complete Dentures, Fixed and Removable Denture Operative Dentistry, Occlusion, Pediatric Dentistry, Oral and Maxillofacial Surgery, Preventive Dentistry, Oral Pathology and Orthodontics.

PROG 9115 - Internal Medicine Rotation. Zero (0) credit.
The resident will have an opportunity to become acquainted with the medical practice and apply the knowledge learned in the Physical Diagnosis course. Grading system: Passed (P), Not Passed (NP)

PROG 9116 - Emergency Rotation. Zero (0) credit.
Hospital Emergency Room experience affords exposive to a diversity of situations wherein the student becomes familiar with the diagnosis and management of many illnesses and bodily injuries. Grading system: Passed (P), Not Passed (NP)

PROG 9117 - Gerodontology. Two (2) credits.
This course consists of a series of lectures, field trips, and clinical experiences to provide the dental students with the knowledge and skills that are required to understand the needs of geriatric patients and to be able to provide them with better dental care.

PROG 9121 - Dental Literature Review I. Two (2) credits.
The resident will be required to present and discuss current articles in the dental literature in order to familiarize themselves with current dental issues as well as to present lectures and seminars to peers.

PROG 9122 - Dental Literature Review II. Two (2) credits.
The residents will be required to present and discuss current articles in the dental literature in order to familiarize themselves with current dental issues as well as to present lectures and seminars to peers.

PROG 9135 - Implant Dentistry for General Practice Residents. Three (3) credits.
This course reviews the concepts of osseointegration, biophysics, materials, indications, contraindications, surgical protocols, rehabilitation, and maintenance, with strong emphasis on diagnosis, treatment planning and proper selection of each patient case. The resident, after proper review of concepts, will successfully complete a minimum of one (1) implant case at the end of the residency year. The course will integrate various modalities of teaching methodologies such as lectures, case presentations and discussions, video presentations, hands on laboratory sessions, computer programs, and clinical performance. Finally, the resident will be able to properly select and manage an implant case from the surgical and prosthodontical standpoint.

PROG 9136 - Advanced Implant Dentistry for General Practice Residents. Three (3) credits. Pre-requisites: PROG 9135.
This course is designed for Second Year GPR residents with the goal of reviewing the literature concerning dental implants and provide direct clinical supervision in the process of implant placements on patients. The course will give special attention to providing the resident with a level of proficiency in the clinical aspect of dental implantology. Also, the resident will be provided with advanced techniques in implant surgery, colocation and prosthetic rehabilitation.

PROG 9145 - New Endodontic Techniques. Three (3) credits.
In this course are presented newest concepts and techniques in endodontic treatment. This one will provide the theory and practice of the use of rotary instruments and new obturation techniques in pulpal therapy. Also, review basic endodontic diagnosis and emergency endodontic treatment by using distance learning methodologies and clinical experiences.

PROG 9146 - Advanced Endodontic Techniques. Three (3) credits. Pre-requisites: PROG 9145.
This course will provide the theory and practice of the use of rotary instruments and new obturation techniques in pulpal therapy. The course will also review basic diagnosis and emergency endodontic

treatment by using distance learning methodologies, lectures and clinical experiences. The resident must be proficient in the didactic and clinical component of this course with different rotatory systems.

PROG 9151 - General Patient Care Clinic I. Two (2) credits.
This course is designed to provide the Second-Year resident with enough clinical experience to develop proficiency at the different disciplines of Dentistry. The course is intended to develop the professional competencies into proficiencies for the advanced level of the Second-Year resident and the clinic will offer the scenario for this educational progression. The resident will assume responsibility for the comprehensive oral healthcare delivery of the patient under constant supervision of the attending and/or specialist. All dental disciplines will be contemplated in the rationale for the execution of the patient's treatment plan. Clinical sites will be at the hospital dental clinic, School of Dentistry, and at community dental clinics.

PROG 9152 - General Patient Care Clinic II. Two (2) credits. Pre-requisites: PROG 9151.
This course is designed to provide practical experience in the treatment of medically compromised patients. Residents will provide advanced state-of-the-art dental services according to the patient's needs. The resident will also acquire experience in student supervision and clinical administration. All clinical activities will be measured at a proficiency level.

PROG 9155 - Oral Health and HIV. Three (3) credits.
Using lecture presentations, group discussions and clinical experiences, the resident will be provided with the basic knowledge and skills required to adequately treat, in a culturally sensitive manner, oral conditions on HIV patients. The resident will also receive instruction in the diagnosis, medical management, stigma, psychosocial aspects and cultural competency in HIV/AIDS patients.

PROG 9156 - Advanced Oral Health and HIV. Three (3) credits. Pre-requisites: PROG 9155.
Through discussions and clinical experiences, the resident will be provided with in depth knowledge and skills required to adequately treat, in a culturally competitive manner, oral conditions on HIV patients and will become acquainted with available funding and management of local and federal monies in the provision of oral health care to the HIV/AIDS population.

PROG 9161 - Advanced Concepts in Clinical Sciences I. Two (2) credits.
This course is designed to provide the resident with the educational experience in critical thinking on dental topics relevant to the profession and to the resident's needs. Subjects to be discussed are advanced concepts in fixed and removable prosthodontics, oral and maxillofacial surgery, pediatric dentistry, dental materials, occlusion, esthetic dentistry, and pathology among others. All disciplines discussed will then be integrated into comprehensive, well designed treatment plans for the benefit of the program's patients after proper presentation by the resident. The course will be offered in the first semester with a continuation in the second semester.

PROG 9162 - Advanced Concepts in Clinical Sciences II. Two (2) credits. Pre-requisites: PROG 9161.
In this course the resident will have advanced experience in the use in dental materials and techniques in implants, rotatory instruments and medically compromised patients. The instructional strategies to be used are: lectures, case presentations and class discussions.

PROG 9175 - Clinical Elective for Second Year Residents. Zero (0) credits.
This elective course is designed for the resident to identify an area of special interest and develop his/her full potential in such discipline. This area should be in consensus with the Second-Year competencies. Once the area is identified, a professor will be chosen as the resident's mentor and, along with the program director, a list of objectives, competencies, and requirements will be devised for compliance by the resident during the entire academic year. The resident will expose their cases during Grands rounds and meetings.

PROG 9185 - Clinical Supervision Rotation. Two (2) credits.
In this course the resident will participate as clinical instructor in the disciplines of operative dentistry, removable restorations, fixed restorations, and community dentistry in the predoctoral curriculum and will also supervise First Year GPR residents in the clinic and emergency room.

PROG 9186 - Administration of Oral Health Services. Three (3) credits.
Using lectures presentations and distance learning methodologies, the residents will acquire knowledge and skills in dental practice management and administration taking into consideration current changes in the Puerto Rico health care delivery system. The federal and local laws and the regulations that govern the dental practice in Puerto Rico will also be studied.

PROG 9187 - Journal Club. Two (2) credits.
The Second-Year residents will be required to have the ability to critically review relevant scientific literature as a foundation for life- long learning and as a way to adapt to new modifications in a constantly changing health care environment. At the beginning of the course, residents will be given instruction in the art of searching information at the available resources, including the library and information technology. Then, after careful preparation, residents are given reading assignments and articles to critically review such and submit their own decisions regarding a specific topic. The Journal Club meets every week throughout the entire year.

PROG 9515 - Professional Studies in Dentistry. Zero (0) credit.
This is a course directed to graduated students in Dentistry. The student selects a specific area of Dentistry in which he/she shows interest in order to deepen his/her knowledge and to develop even more the skills previously acquired. The student is exposed to the most recent literature in all fields of Dentistry and to enhance his/her capacity to critically analyze divergent points of view and to become familiar with the new trends. The theoretical knowledge acquired will be placed into practice through clinical work, in a full time basis during the semester. The course is offered through lectures, literature review, seminars, clinical work, laboratory and research. At the end of the course the student will have a deep knowledge of the selected subject and will be able to integrate the acquired concepts and the refined skills to apply them in real clinical situations. Grading System: Passed (P), Not Passed (NP).

REST 9001 - Complete Dentures Seminar I. Two (2) credits.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of complete dentures.

REST 9002 - Complete Dentures Seminar II. Two (2) credits. Pre-requisite: REST 9001.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of complete dentures.

REST 9003 - Complete Dentures Seminar III. Two (2) credits. Pre-requisites: REST 9002.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of complete dentures.

REST 9004 - Complete Dentures Seminar IV. Two (2) credits. Pre-requisite: REST 9003.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of complete dentures.

REST 9011 - Removable Partial Dentures Seminar I. Two (2) credits.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of removable partial dentures.

REST 9012 - Removable Partial Dentures Seminar II. Two (2) credits. Pre-requisite: REST 9011.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of removable partial dentures.

REST 9013 - Removable Partial Dentures Seminar III. Two (2) credits. Pre-requisite: REST 9012.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of removable partial dentures.

REST 9014 - Removable Partial Dentures Seminar IV. Two (2) credits. Pre-requisite: REST 9013.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of removable partial dentures.

REST 9021 - Fixed Partial Dentures Seminar I. Two (2) credits.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of fixed partial dentures.

REST 9022 - Fixed Partial Dentures Seminar II. Two (2) credits. Pre-requisite: REST 9021.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of fixed partial dentures.

REST 9023 - Fixed Partial Dentures Seminar III. Two (2) credits. Pre-requisite: REST 9012.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of fixed partial dentures.

REST 9024 - Fixed Partial Dentures Seminar IV. Two (2) credits. Pre-requisite: REST 9023.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of fixed partial dentures.

REST 9031 - Maxillofacial Prosthetics Seminar I. Two (2) credits.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of maxillofacial prostheses.

REST 9032 - Maxillofacial Prosthetics Seminar II. Two (2) credits. Pre-requisite: REST 9031.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of maxillofacial prostheses.

REST 9033 - Maxillofacial Prosthetics Seminar III. Two (2) credits.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of maxillofacial prostheses.

REST 9034 - Maxillofacial Prosthetics Seminar IV. Two (2) credits.
The student will present at a seminar the theories and procedures involved in the fabrication and follow-up of maxillofacial prostheses.

REST 9041 - Biomedical Sciences Seminar I. Two (2) credits.
The student will present at a seminar subjects related to dental materials, medical conditions that could affect dental treatment, and dental equipment. Use of dental equipment and materials will be demonstrated.

REST 9042 - Biomedical Sciences Seminar II. Two (2) credits. Pre-requisite: REST 9041.
The student will present at a seminar subjects related to dental materials, medical conditions that could affect dental treatment, and dental equipment. Use of dental equipment and materials will be demonstrated.

REST 9043 - Biomedical Sciences Seminar III. Two (2) credits. Pre-requisites: REST 9041, REST 9042.
The student will present at a seminar subjects related to dental materials, medical conditions that could affect dental treatment, and dental equipment. Use of dental equipment and materials will be demonstrated.

REST 9044 - Biomedical Sciences Seminar IV. Two (2) credits. Pre-requisites: REST 9041, REST 9042, REST 9043.
The student will present at a seminar subjects related to dental materials, medical conditions that could affect dental treatment, and dental equipment. Use of dental equipment and materials will be demonstrated.

REST 9051 - Dental Implants I. Two (2) credits.
The student will learn in seminars and lectures the development and use of dental implants.

REST 9052 - Dental Implants II. Two (2) credits. Pre-requisite: REST 9051.
The student will learn in seminars and lectures the development and use of dental implants.

REST 9071 - Postgraduate Prosthodontics Clinic I. Nine (9) credits.
The student will perform prosthodontic clinical procedures under supervision of the teaching staff.

REST 9072 - Postgraduate Prosthodontics Clinic II. Nine (9) credits. Pre-requisite: REST 9071.
The student will perform prosthodontic clinical procedures under supervision of the teaching staff.

REST 9073 - Postgraduate Prosthodontics Clinic III. Nine (9) credits. Pre-requisite: REST 9072.
The student will perform prosthodontic clinical procedures under supervision of the teaching staff.

REST 9074 - Postgraduate Prosthodontics Clinic IV. Nine (9) credits. Pre-requisite: REST 9073.
The student will perform prosthodontic clinical procedures under supervision of the teaching staff.

REST 9075 - Postgraduate Prosthodontics Clinic V. Nine (9) credits. Pre-requisites: REST 9071, REST 9072, REST 9073, REST 9074.
This course consists of practical experiences for the graduate student in the areas of Complete Dentures, Removable Partial Dentures, Fixed Partial Dentures and Maxillofacial Prosthetics. These experiences are intended to develop proficiency in the management of all types of prosthodontic patients, ranging from routine cases up to difficult cases. The student will also treat patients needing endosseous implants as part of their oral rehabilitation. The student will interact with other specialists (oral surgeons, periodontists) as part of an implant team in the diagnosis and treatment planning of these patients. This course prepares the student for his future practice as a prosthodontist, when he will be treating patients beyond the scope of a general practitioner.

REST 9076 - Postgraduate Prosthodontics Clinic VI. Nine (9) credits. Pre-requisites: REST 9071, REST 9072, REST 9073, REST 9074, REST 9075.
This course consists of practical experiences for the graduate student in the areas of Complete Dentures, Removable Partial Dentures, Fixed Partial Dentures and Maxillofacial Prosthetics. These experiences are intended to develop proficiency in the management of all types of prosthodontic patients, ranging from routine cases up to difficult cases. The student will also treat patients needing endosseous implants as part of their oral rehabilitation. The student will interact with other specialists (oral surgeons, periodontists) as part of an implant team in the diagnosis and treatment planning of these patients. This course prepares the

student for his future practice as a prosthodontist, when he will be treating patients beyond the scope of a general practitioner.

REST 9081 - Occlusion Seminar I. Two (2) credits.
The course consists of a series of lectures and seminars with demonstrations of the theories of occlusion. The student will learn the basic physiologic mechanisms which determine mandibular movement and occlusion.

REST 9082 - Occlusion Seminar II. Two (2) credits. Pre-requisite: REST 9081.
The course consists of a series of lectures, seminars, and demonstrations of the theories of occlusion. The student will learn the basic physiologic mechanisms which determine mandibular movement and occlusion.

REST 9083 - Occlusion Seminar III. Two (2) credits. Pre-requisite: REST 9082.
The course consists of a series of lectures, seminars, and demonstrations of the theories of occlusion. The student will learn the basic physiologic mechanisms which determine mandibular movement and occlusion.

REST 9084 - Occlusion Seminar IV. Two (2) credits. Pre-requisite: REST 9083.
The course consists of a series of lectures, seminars, and demonstrations of the theories of occlusion. The student will learn the basic physiologic mechanisms which determine mandibular movement and occlusion.

REST 9095 - Introduction to Prosthodontics Laboratory. Two (2) credits.
The student will learn different laboratory techniques. The student will practice laboratory techniques in complete, partial removable, and fixed partial prostheses.

REST 9101 - Treatment Planning and Therapy Seminar I. Two (2) credits.
Diagnosis and treatment planning are the most important procedures to be performed before an oral rehabilitation treatment is considered. At this stage, the prosthodontist considers the strategic significance of all remaining teeth and the quality of the oral tissues, especially those which will be affected by a dental prosthesis. A diagnostic protocol will aid in providing the necessary data that will determine the treatment options for the patient. A thorough knowledge of oral diagnostic techniques will be useful in accomplishing this task. This course is designed to aid the student develop the diagnostic skills necessary for establishing suitable treatment plans for the patient. This course consists of a series of lectures concerning oral examination, periodontal probing, bite registration techniques, face bow transfer, dental articulator mounting, diagnostic wax-up, intraoral photography and treatment planning. The student will prepare his cases for a presentation before the program faculty, residents, and invited guests. The presentation consists of a slide presentation with his case properly mounted on articulator, diagnostic wax-up and/or RPD designs. Once presented, the case will be thoroughly evaluated in a group discussion and a final treatment plan will be established. During treatment of the case, the student may be asked to prepare a presentation on some aspect of the treatment which may be beneficial for the residents and faculty. A final presentation is expected once the treatment has been completed.

REST 9102 - Treatment Planning and Therapy Seminar II. Two (2) credits.
Diagnosis and treatment planning are the most important procedures to be performed before an oral rehabilitation treatment is considered. At this stage, the prosthodontist considers the strategic significance of all remaining teeth and the quality of the oral tissues, especially those which will be affected by a dental prosthesis. A diagnostic protocol will aid in providing the necessary data that will determine the treatment options for the patient. A thorough knowledge of oral diagnostic techniques will be useful in accomplishing this task. This course is designed to aid the student develop the diagnostic skills necessary for establishing suitable treatment plans for the patient. This course consists of a series of lectures concerning oral examination, periodontal probing, bite registration techniques, face bow transfer, dental articulator mounting, diagnostic wax-up, intraoral photography and treatment planning. The student will prepare his

cases for a presentation before the program faculty, residents and invited guests. The presentation consists of a slide presentation with his case properly mounted on articulator, diagnostic wax-up and/or RPD designs. Once presented, the case will be thoroughly evaluated in a group discussion and a final treatment plan will be established. During treatment of the case, the student may be asked to prepare a presentation on some aspect of the treatment which may be beneficial for the residents and faculty. A final presentation is expected once the treatment has been completed.

REST 9103 - Treatment Planning and Therapy Seminar III. Two (2) credits.
Diagnosis and treatment planning are the most important procedure to be performed before an oral rehabilitation treatment is considered. At this stage, the prosthodontist considers the strategic significance of all remaining teeth and the quality of the oral tissues, especially those which will be affected by a dental prosthesis. A diagnostic protocol will aid in providing the necessary data that will determine the treatment options for the patient. A thorough knowledge of oral diagnostic techniques will be useful in accomplishing this task. This course is designed to aid the student develop the diagnostic skills necessary for establishing suitable treatment plans for the patient. This course consists of a series of lectures concerning oral examination, periodontal probing, bite registration techniques, face bow transfer, dental articulator mounting, diagnostic wax-up, intraoral photography and treatment planning. The student will prepare his cases for a presentation before the program faculty, residents and invited guests. The presentation consists of a slide presentation with his case properly mounted on articulator, diagnostic wax-up and/or RPD designs. Once presented, the case will be thoroughly evaluated in a group discussion and a final treatment plan will be established. During treatment of the case, the student may be asked to prepare a presentation on some aspect of the treatment which may be beneficial for the residents and faculty. A final presentation is expected once the treatment has been completed.

REST 9104 - Treatment Planning and Therapy Seminar IV. Two (2) credits.
Diagnosis and treatment planning are the most important procedures to be performed before an oral rehabilitation treatment is considered. At this stage, the prosthodontist considers the strategic significance of all remaining teeth and the quality of the oral tissues, especially those which will be affected by a dental prosthesis. A diagnostic protocol will aid in providing the necessary data that will determine the treatment options for the patient. A thorough knowledge of oral diagnostic techniques will be useful in accomplishing this task. This course is designed to aid the student develop the diagnostic skills necessary for establishing suitable treatment plans for the patient. This course consists of a series of lectures concerning oral examination, periodontal probing, bite registration techniques, face bow transfer, dental articulator mounting, diagnostic wax-up, intraoral photography and treatment planning. The student will prepare his cases for a presentation before the program faculty, residents and invited guests. The presentation consists of a slide presentation with his case properly mounted on articulator, diagnostic wax-up and/or RPD designs. Once presented, the case will be thoroughly evaluated in a group discussion and a final treatment plan will be established. During treatment of the case, the student may be asked to prepare a presentation on some aspect of the treatment which may be beneficial for the residents and faculty. A final presentation is expected once the treatment has been completed.

REST 9105 - Treatment Planning and Therapy Seminar V. Two (2) credits.
Diagnosis and treatment planning are the most important procedures to be performed before an oral rehabilitation treatment is considered. At this stage, the prosthodontist considers the strategic significance of all remaining teeth and the quality of the oral tissues, especially those which will be affected by a dental prosthesis. A diagnostic protocol will aid in providing the necessary data that will determine the treatment options for the patient. A thorough knowledge of oral diagnostic techniques will be useful in accomplishing this task. This course is designed to aid the student develop the diagnostic skills necessary for establishing suitable treatment plans for the patient. This course consists of a series of lectures concerning oral examination, periodontal probing, bite registration techniques, face bow transfer, dental articulator

mounting, diagnostic wax-up, intraoral photography and treatment planning. The student will prepare his cases for a presentation before the program faculty, residents and invited guests. The presentation consists of a slide presentation with his case properly mounted on articulator, diagnostic wax-up and/or RPD designs. Once presented, the case will be thoroughly evaluated in a group discussion and a final treatment plan will be established. During treatment of the case, the student may be asked to prepare a presentation on some aspect of the treatment which may be beneficial for the residents and faculty. A final presentation is expected once the treatment has been completed.

REST 9106 - Treatment Planning and Therapy Seminar VI. Two (2) credits.
Diagnosis and treatment planning are the most important procedures to be performed before an oral rehabilitation treatment is considered. At this stage, the prosthodontist considers the strategic significance of all remaining teeth and the quality of the oral tissues, especially those which will be affected by a dental prosthesis. A diagnostic protocol will aid in providing the necessary data that will determine the treatment options for the patient. A thorough knowledge of oral diagnostic techniques will be useful in accomplishing this task. This course is designed to aid the student develop the diagnostic skills necessary for establishing suitable treatment plans for the patient. This course consists of a series of lectures concerning oral examination, periodontal probing, bite registration techniques, face bow transfer, dental articulator mounting, diagnostic wax-up, intraoral photography and treatment planning. The student will prepare his cases for a presentation before the program faculty, residents and invited guests. The presentation consists of a slide presentation with his case properly mounted on articulator, diagnostic wax-up and/or RPD designs. Once presented, the case will be thoroughly evaluated in a group discussion and a final treatment plan will be established. During treatment of the case, the student may be asked to prepare a presentation on some aspect of the treatment which may be beneficial for the residents and faculty. A final presentation is expected once the treatment has been completed.

Faculty

ABREU-LÓPEZ, EVELYN – *Assistant Professor*; DDS, 1990, University of Maryland - Baltimore.

ACEVEDO-RODRÍGUEZ, MARIELA – *Associate Professor*; DMD, 2009, University of Puerto Rico - Medical Sciences Campus.

ACEVEDO-RODRÍGUEZ, VIVIANA - *Professor*; DMD, 2009, University of Puerto Rico - Medical Sciences Campus.

ACOSTA-PÉREZ, BRENDA L. – *Assistant Professor*; DMD, 2014, University of Puerto Rico - Medical Sciences Campus.

AGRAIT-DEFILLÓ, EMILIO M. - *Professor*; DMD, 1978, University of Puerto Rico - Medical Sciences Campus.

ALACÁN-RIOS, KARLA - *Assistant Professor*; DMD, 2017, University of Puerto Rico - Medical Sciences Campus.

ALEMAÑY-VIDAL, JUAN C. – *Assistant Professor*; DDS, 1992, Marquette University - Wisconsin.

ALFONSO-PAGÁN, ANTONIA H. – *Assistant Professor*; DMD, 2007, University of Puerto Rico – Medical Sciences Campus.

ALÍ-HERNÁNDEZ, NAJEMA – *Professor*; DMD, 2008, University of Puerto Rico - Medical Sciences Campus.

ALVARADO-DÍAZ, CARLOS A. - *Assistant Professor*; PhD, 2005, University of Connecticut.

APONTE-MONTAÑEZ, JUAN C. - *Assistant Professor*; DMD, 1991, University of Puerto Rico - Medical Sciences Campus.

AROCHO-SALGADO, LIS - *Assistant Professor*; DMD, 2002, University of Puerto Rico - Medical Sciences Campus.

ARROYO-CALIXTO, LINDANYR – *Associate Professor*; DMD, 1996, University of Puerto Rico - Medical Sciences Campus.

ARROYO-JULIÁ, ALICE M. - *Assistant Professor*; DMD, 2017, University of Puerto Rico - Medical Sciences Campus.

ARVELO-SERRES, BETZI – *Assistant Professor*; DMD, 2012 Rutgers School of Dentistry.

AYMAT-RODRÍGUEZ, WANDA - *Associate Professor*; DMD, 1996, University of Puerto Rico - Medical Sciences Campus.

BANUCHI-GARCÍA, IRENE M. – *Assistant Professor*; DMD, 1991, University of Puerto Rico - Medical Sciences Campus.

BELARDO-MARRERO, EDGAR A. - *Assistant Professor*; DDS, 1998, New York University.

BERMÚDEZ-SEGARRA, FRANCISCO L. - *Professor*; DMD, 1989, University of Puerto Rico - Medical Sciences Campus; PhD, 1998, University of Rochester - New York.

BERRIOS-DÍAZ, MARIENALDY - *Assistant Professor*; DMD, 1991, University of Puerto Rico - Medical Sciences Campus.

BERRIOS-HERNÁNDEZ, MARÍA I. – *Assistant Professor*; DMD, 2003, University of Puerto Rico – Medical Sciences Campus.

BERRIOS-MIRANDA, DENISHA M. – *Assistant Professor*; DMD, 2020, University of Puerto Rico – Medical Sciences Campus.

BLANCO-PLARD, ARTURO L. – *Associate Professor*; DMD, 1987, University of Puerto Rico - Medical Sciences Campus.

BUSQUETS-VAELLO, CELIMAR – *Assistant Professor*; DMD, 2001, University of Puerto Rico – Medical Sciences Campus

BUXÓ-MARTÍNEZ, CARMEN J. - *Professor*; DrPH, 2009, University of Puerto Rico - Medical Sciences Campus.

CACHO-MARTINICORENA, CHRISTIAN C. - *Assistant Professor*; DMD, 2007, University of Puerto Rico - Medical Sciences Campus.

CACHO-MARTINICONERA, ROBERT A. - *Assistant Professor*; DMD, 1999, University of Puerto Rico - Medical Sciences Campus.

CALERO DOITTEAU, JAVIER – *Assistant Professor*; DMD, 2014, University of Puerto Rico – Medical Sciences Campus.

CAMPOS-RIVERA, MARIBEL - *Professor*; MD, 1998, University of Puerto Rico - Medical Sciences Campus.

CAÑIZARES-ROSARIO, RICHARD – *Assistant Professor*; DMD, 2007, University of Puerto Rico - Medical Sciences Campus.

CARRO-RIVERA, FELIPE L. - *Assistant Professor*; DMD, 1979, University of Puerto Rico - Medical Sciences Campus.

CASIANO-QUILES, YOLANDA – *Assistant Professor*; DMD, 1995, University of Puerto Rico – Medical Sciences Campus.

CASTELLVÍ-ARMAS, MARÍA C. - *Professor*; DMD, 1996, University of Puerto Rico - Medical Sciences Campus.

CHARDÓN-NARVAEZ, ANTONIO U. - *Assistant Professor*; DMD, 2006, University of Puerto Rico - Medical Sciences Campus.

CHÉVEREZ-GONZÁLEZ, PEDRO A. - *Assistant Professor*; DMD, 1989, University of Puerto Rico - Medical Sciences Campus.

COLÓN-ALCARAZ, DIVYA Ch. - *Professor*; DMD, 1992, University of Puerto Rico - Medical Sciences Campus.

COLÓN-DEGLANS, LIZBETH M. – *Assistant Professor*; DMD, 1996, University of Puerto Rico – Medical Sciences Campus.

COLÓN-HERNÁNDEZ, VICENTE A. - *Associate Professor*, DMD, 1976, University of Puerto Rico - Medical Sciences Campus.

CRUZ-DE LA CRUZ, ÁNGEL D. - *Assistant Professor*; DMD, 2019, University of Puerto Rico – Medical Sciences Campus.

DE JESÚS-GONZÁLEZ, ARNALDO J. - *Professor*; DMD, 1966, University of Puerto Rico - Medical Sciences Campus.

DE JESÚS-MONTALVO, CARMEN O. - *Assistant Professor*; DMD, 1988, University of Puerto Rico - Medical Sciences Campus.

DEBS-ELÍAS, NATALIO - *Assistant Professor*; MD, 1981, University of Puerto Rico - Medical Sciences Campus.

DEL PILAR-ALVARADO, PATRICIA – *Assistant Professor*; DMD, 2011, University of Puerto Rico - Medical Sciences Campus.

DÍAZ-CABRERO, LUIS J. – *Assistant Professor*; DMD, 2001, University of Puerto Rico - Medical Sciences Campus.

DÍAZ-MARRERO, ZULHERMI – Psychologist; Psy.D, 2015, Ponce Health Science University.

DÍAZ-MÉNDEZ, RAFAEL E. - *Assistant Professor*; DMD, 1979, University of Puerto Rico - Medical Sciences Campus.

DÍAZ-PAGÁN, EUSEBIO A. - *Associate Professor*; DMD, 1969, University of Puerto Rico - Medical Sciences Campus.

DÍAZ-RUBAYO, DANIEL - *Assistant Professor*, DMD, 2014, University of Puerto Rico - Medical Sciences Campus.

DÍAZ-TORO, ELBA C. - *Professor*; DMD, 1993, University of Puerto Rico - Medical Sciences Campus.

DÍAZ-ZAYAS, MARÍA V. - *Assistant Professor*; DMD, 2012, University of Puerto Rico - Medical Sciences Campus.

DOMENECH-FAGUNDO, LUZANNE - *Assistant Professor*; DMD, 1994, University of Puerto Rico - Medical Sciences Campus.

DUPREY- DÍAZ, MILDRED V. – *Assistant Professor*; 2016, PhD, University of Puerto Rico – Medical Sciences Campus.

ECHEVARRÍA-STUART, EDGAR - *Professor*; DMD, 1976, University of Puerto Rico - Medical Sciences Campus.

ELÍAS-BONETA, AUGUSTO R. - *Professor*; DMD, 1973, University of Puerto Rico - Medical Sciences Campus.

ENCARNACION-GINES, YATNEE A. - *Assistant Professor*; DMD, 2017, University of Puerto Rico - Medical Sciences Campus.

ESCALERA-MALDONADO, FRANCES - *Assistant Professor*; DMD, 2012, University of Puerto Rico - Medical Sciences Campus.

ESQUILÍN-CRUZ, MELBA - *Assistant Professor*; DMD, 1994, University of Puerto Rico - Medical Sciences Campus.

FADHEL-CASTELLVÍ, GUSTAVO – *Associate Professor*; DMD, 1987, University of Puerto Rico – Medical Sciences Campus.

FERNÁNDEZ-RÍOS, MILITZA, - *Professor*; DMD, 1975, University of Puerto Rico - Medical Sciences Campus.

FERRER-LOPATEGUI, FERNANDO E. - *Professor*; DMD, 1966, University of Puerto Rico - Medical Sciences Campus.

FERRER-NUIN, LUIS F. – *Assistant Professor*; DMD, 1988, University of Puerto Rico - Medical Sciences Campus.

FIGUEROA-ACEVEDO, AMANDA - *Assistant Professor*; DMD, University of Puerto Rico - Medical Sciences Campus.

FIGUEROA-PÉREZ, NANETTE – *Assistant Professor*; DMD, 2011, University of Puerto Rico – Medical Sciences Campus.

FLORES-CASTILLO, ADDISON - *Assistant Professor*; DMD, 1996, University of Puerto Rico - Medical Sciences Campus.

FUENTES-ARROYO, GABRIEL A. - *Assistant Professor*; DMD, 2008, University of Puerto Rico - Medical Sciences Campus.

GALLARDO-TORRES-AGUIAR, DIEGO A. – *Assistant Professor*; DMD, 2011, University of Puerto Rico – Medical Sciences Campus.

GAVILANES-MÉNDEZ, RAFAEL A. – *Assistant Professor*; DMD, 2014, University of Puerto Rico - Medical Sciences Campus.

GIL-RODRÍGUEZ, MARIANNE – *Assistant Professor*; DMD, 1999, University of Puerto Rico – Medical Sciences Campus.

GOLDBERGER, ROBERT S. - *Assistant Professor*; DDS, 1982, New York University.

GONZÁLEZ-BORRERO, MARDILY – *Assistant Professor*; DMD, 2003, University of Puerto Rico – Medical Sciences Campus.

GONZÁLEZ-CARBONELL, ANDREA J. – *Assistant Professor*; DMD, 2012, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-GARCÍA, RAMÓN F. - *Professor*; DDS, 1990, New York University.

GONZÁLEZ-GUTIÉRREZ, NICOLE M.– *Assistant Professor*; DMD, 2019, University of Puerto Rico – Medical Sciences Campus.

GONZÁLEZ-LÓPEZ, RICKY O. – *Assistant Professor*; DMD, 2011, University of Puerto Rico – Medical Sciences Campus.

GONZÁLEZ-MELÉNDEZ, DANNELLY B. - *Assistant Professor*; DMD, 2007, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-RODRÍGUEZ, MANUEL A. - *Professor*; DMD, 1974, University of Puerto Rico - Medical Sciences Campus.

GONZÁLEZ-SÁNCHEZ, MITZI M. - *Assistant Professor*; DMD, 1999, University of Puerto Rico - Medical Sciences Campus.

GUERRERO-RODRÍGUEZ, LIDIA M. - *Professor*; DMD, 1992, University of Puerto Rico - Medical Sciences Campus.

GUO, KAI – *Assistant Professor*; PhD, 2019, University of Puerto Rico – Río Piedras Campus.

GUZMÁN-FREIRE, JULIO E. – *Professor*; DMD, 1974, University of Puerto Rico - Medical Sciences Campus.

HANKE-HERRERO, ROSANA - *Professor*; DMD, 1998, University of Puerto Rico - Medical Sciences Campus.

HEREDIA-MATOS, YOLANDA - *Professor*; DMD, 1999, University of Puerto Rico - Medical Sciences Campus.

HERNÁNDEZ-DUPREY, MANUEL E. - *Assistant Professor*; DMD, 1987, University of Puerto Rico - Medical Sciences Campus.

HERNÁNDEZ-ORSINI, ROBERTO – *Associate Professor*; DMD, 1983, University of Puerto Rico - Medical Sciences Campus.

HERNÁNDEZ-RIVERA, MICOL B. – *Assistant Professor*; DMD, 2011, University of Puerto Rico - Medical Sciences Campus.

HERNÁNDEZ-SÁNCHEZ, RAFAEL A. - *Assistant Professor*; DMD, 1989, University of Puerto Rico - Medical Sciences Campus.

HERRERO-NÁTER, FRANCES M. – *Assistant Professor*; DMD, 2014, University of Puerto Rico – Medical Sciences Campus.

IRIZARRY-CARO, TERESA J. - *Professor*; DMD, 1983, University of Puerto Rico - Medical Sciences Campus.

IZCOA-FLORES, CARLOS A. – *Assistant Professor*; DMD, 1995, University of Puerto Rico – Medical Sciences Campus.

IZQUIERDO-RODRÍGUEZ, GINETTE M. - *Associate Professor*; DMD, 1996, University of Puerto Rico - Medical Sciences Campus.

JOGLAR-CACHO, RAFAEL A. - *Associate Professor*, DMD, 1980, University of Puerto Rico - Medical Sciences Campus.

LEBRÓN-ARROYO, SANTOS L. - *Professor*; DMD, 1982, University of Puerto Rico - Medical Sciences Campus.

LEÓN-TORRES, ATILANO – *Professor*; DMD, 1974, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-DÁVILA, ANA R. - *Professor*; DMD, 1991, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-DEL VALLE, LYDIA M. - *Professor*; DMD, 1981, University of Puerto Rico - Medical Sciences Campus.

LÓPEZ-FUENTES, ANA N. - *Professor*; DMD, 1987, University of Puerto Rico - Medical Sciences Campus.

LUGO-ROMEU, FERDINAND - *Professor*; DMD, 1974, University of Puerto Rico - Medical Sciences Campus.

MARTÍNEZ-ROMÁN, CRISTINA - *Assistant Professor*; DMD, 2009, University of Puerto Rico - Medical Sciences Campus.

MARTÍNEZ-RUBIO, LUISA M. – *Assistant Professor*; DMD, 1992, University of Puerto Rico – Medical Sciences Campus.

MATOS-PÉREZ, JOSÉ R. - *Professor*; DMD, 1991, University of Puerto Rico - Medical Sciences Campus.

MATOS-ROMÁN, MILTON - *Assistant Professor*; DMD, 2007, University of Puerto Rico - Medical Sciences Campus.

MEDINA-PANETO, JOCELYN A. - *Professor*; PhD, 2007, University of Puerto Rico - Río Piedras Campus.

MELÓN-RAMOS, ELIEL – *Associate Professor*; PhD, 2016, Nova Southern University – Florida.

MOLINA-NEGRÓN, DAMARIS - *Professor*; DMD, 1996, University of Puerto Rico - Medical Sciences Campus.

MOLINA-NEGRÓN, JUAN L. – *Assistant Professor*; DMD, 1995, University of Puerto Rico - Medical Sciences Campus.

MORA-GONZÁLEZ, DANNY – *Assistant Professor*; DMD, 2009, University of Puerto Rico – Medical Sciences Campus.

MORALES-DÍAZ, JOSÉ A. - *Associate Professor*; DMD, 1982, University of Puerto Rico - Medical Sciences Campus.

MORALES-GONZÁLEZ, JOSÉ A. – *Assistant Professor*; DMD, 2011, University of Puerto Rico - Medical Sciences Campus.

MORALES-SOTO, MELISSA – *Assistant Professor*; DMD, 2018, University of Puerto Rico – Medical Sciences Campus.

MOROU-NEOFOTISTOU, EVANGELIA - *Professor*; DDS, 1990, National Kapodistrian University – Greece; PhD, 1999, University of Rochester, Eastman Dental Center - New York.

MUÑOZ-CORREA, YANELIS- *Assistant Professor; DMD,*2013, University of Puerto Rico - Medical Sciences Campus.

NAIM-COBTI, WADIH – *Associate Professor*; DMD, 1989, Boston University.

NAZARIO-PIETRI, GLORIA R. – *Assistant Professor*; MA, 1984, The New School for Social Research – New York.

NEGRÓN-BERRÍOS, MARCELINO - *Professor*; DMD, 1975, University of Puerto Rico - Medical Sciences Campus.

NEGRÓN-LUCIANO, IVETTE – *Assistant Professor*; DMD, 1987, University of Puerto Rico - Medical Sciences Campus.

NEGRÓN-QUESADA, INA I. - *Professor*; DMD, 1981, University of Puerto Rico - Medical Sciences Campus.

NÚÑEZ-ORTA, JOSÉ J. – *Assistant Professor*; DMD, 2013, University of Puerto Rico – Medical Sciences Campus.

ORDAZ-MOGUEL, SAMANTHA – *Assistant Professor*; DMD, 2019, University of Puerto Rico – Medical Sciences Campus.

ORSINI-LÓPEZ, ELIZABETH M. – *Associate Professor*; DMD, 2004, University of Puerto Rico - Medical Sciences Campus.

ORTIZ-DELGADO, YASLIN DEL C. – *Assistant Professor*; DMD, 2005, University of Puerto Rico – Medical Sciences Campus.

ORTIZ-DÍAZ, CRISTINA – *Assistant Professor*; DMD, 2014, University of Puerto Rico – Medical Sciences Campus.

ORTIZ-GALARZA, LILLIAM – *Assistant Professor*; DMD, 1988, University of Puerto Rico - Medical Sciences Campus.

ORTIZ-GIULIANI, BRUNILDA M. - *Assistant Professor*; DMD, 2008, University of Puerto Rico - Medical Sciences Campus.

PAGÁN-COLLAZO, GRACE J. - *Professor*; DMD, 2000, University of Puerto Rico - Medical Sciences Campus.

PAGÁN-LÓPEZ, ÁNGEL R. - *Professor*; DMD, 1979, University of Puerto Rico - Medical Sciences Campus.

PAGÁN-ORTIZ, ELAINE M. - *Professor*; DMD, 1990, University of Puerto Rico - Medical Sciences Campus.

PAULO-MALAVÉ, CHERYL - *Associate Professor*; DMD, 2008, University of Puerto Rico - Medical Sciences Campus.

PEREIRA-DÍAZ, FÉLIX A. - *Assistant Professor*; DMD, 1976, University of Puerto Rico - Medical Sciences Campus.

PÉREZ-LÓPEZ, CAMILA A. – *Assistant Professor*; DMD, 2019, University of Puerto Rico – Medical Sciences Campus.

PÉREZ-MOLL, JOSÉ F. - *Professor*; DMD, 1973, University of Puerto Rico - Medical Sciences Campus.

PÉREZ-MONTES, NORBERTO - *Assistant Professor*; DMD, 1975, University of Puerto Rico - Medical Sciences Campus.

PÉREZ-PÉREZ, GLORIVÍ - *Assistant Professor*; DMD, 1995, University of Puerto Rico - Medical Sciences Campus.

PÉREZ-SANTIAGO, JOSUÉ – *Assistant Professor*; PhD, 2012, University of California.

PÉREZ-VELÁZQUEZ, MITZY - *Associate Professor*; DMD, 2001, University of Puerto Rico - Medical Sciences Campus.

PICÓN-CUNNINGHAM, FRANCIS - *Professor*; DMD, 1992, University of Puerto Rico - Medical Sciences Campus.

PIOVANETTI-ORTIZ, GIANNA N. - *Assistant Professor*; EdD, 2021, University of Puerto Rico - Río Piedras Campus.

POLHAMUS-LÓPEZ, MELISA – *Assistant Professor*; DMD, 2007, University of Puerto Rico - Medical Sciences Campus.

POLO-LÓPEZ, MARIO - *Assistant Professor*; DMD, 1973, University of Puerto Rico - Medical Sciences Campus.

PORTELA-GONZÁLEZ, RAFAEL A. - *Associate Professor*; DMD, 1993, University of Puerto Rico - Medical Sciences Campus.

PRATS-LAZZARINI, LORENZO M. - *Assistant Professor*; DMD, 1979, University of Puerto Rico - Medical Sciences Campus.

PRATS-PALERM, MAGDA - *Assistant Professor*; DMD, 1989, University of Puerto Rico - Medical Sciences Campus.

PUIG-QUIÑONES, LYANN M. – *Assistant Professor*; DMD, 2010, University of Puerto Rico – Medical Sciences Campus.

QUESADA-COLÓN, HÉCTOR L. - *Professor*; DMD, 1973, University of Puerto Rico - Medical Sciences Campus.

QUIÑONES-QUIÑONES, CARLOS R. – *Associate Professor*; DMD, 1988, University of Puerto Rico – Medical Sciences Campus.

RAMÍREZ-BRUNET, FRANCISCO - *Professor*; DMD, 1971, University of Puerto Rico - Medical Sciences Campus.

RAMÍREZ-LÓPEZ, GUILLERMO V. - *Associate Professor*; DMD, 1975, University of Puerto Rico - Medical Sciences Campus

RAMOS-FUENTES, HÉCTOR E. - *Assistant Professor*; DMD, 1973, University of Puerto Rico - Medical Sciences Campus.

RAMOS-RODRÍGUEZ, MARIELA E. – *Assistant Professor*; DMD, 2009, University of Puerto Rico – Medical Sciences Campus.

RESTITUYO-ROSARIO, JANNELLY - *Assistant Professor*; DMD, 2009, University of Puerto Rico - Medical Sciences Campus

RÍOS-REYES, ILKA DEL C. - *Professor*; DMD, 1980, University of Puerto Rico - Medical Sciences Campus.

RIVAS-TUMANYAN, SONA E. - *Associate Professor*; DMD, 1999, Yerevan State Medical University - Armenia; DrPH, 2011, Harvard University - Massachusetts.

RIVERA-HERNÁNDEZ, MARLYAN – *Assistant Professor*; DMD, 2018, University of Puerto Rico – Medical Sciences Campus.

RIVERA-LUNA, ANTONIO F. - *Assistant Professor*; DMD, 2003, University of Puerto Rico - Medical Sciences Campus.

RIVERA-MENDEZ, VÍCTOR A. - *Assistant Professor*; DMD, 2015, University of Puerto Rico - Medical Sciences Campus.

RIVERA-MORALES, XIOMARA N. - *Professor*; DMD, 2005, University of Puerto Rico - Medical Sciences Campus.

RIVERA-RAMOS, FEDERICO A. - *Professor*; DMD, 1975, University of Puerto Rico - Medical Sciences Campus.

RIVERA-RIVERA, LINA N. – *Assistant Professor*; DMD, 2017, University of Puerto Rico – Medical Sciences Campus.

RIVERA-SANFIORENZO, CAMIBI, *Assistant Professor*; DMD, 1982, University of Puerto Rico - Medical Sciences Campus.

RIVERA-VIRELLA, BONIFACIO - *Assistant Professor*; DMD, 1983, University of Puerto Rico - Medical Sciences Campus.

RIVERA-ZAYAS, JOSÉ L. – *Assistant Professor*; DDS, 1993, Temple University.

RODRÍGUEZ-BONILLA, CARLA D. *Professor*; DMD, 2003, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-DELGADO, LIZBETH – *Assistant Professor*; DMD, 2013, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-ESTRADA, DUNIA DE LA C. - *Professor*; DMD, 2003, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-GARCÍA, SEBASTIÁN – Assistant Professor; DMD, 2018, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-GONZÁLEZ, ENRIQUE J. - *Professor*; DMD, 1978, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-HERNANDEZ, LORNA A. - *Professor*; DMD, 1980, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-LOYOLA, HERNÁN M. - *Assistant Professor*; DMD, 1978, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-NOBOA RUTH - *Assistant Professor*; DDS, 1988, Northwestern University.

RODRÍGUEZ-RÍOS, JOEL – *Assistant Professor*; DMD, 2008, University of Puerto Rico - Medical Sciences Campus.

RODRÍGUEZ-RODRÍGUEZ, NELSON - *Associate Professor*, DMD, 1998, University of Puerto Rico - Medical Sciences Campus.

ROSA-HERNÁNDEZ, ELSIMARIE – *Assistant Professor*; DMD, 2012, University of Puerto Rico - Medical Sciences Campus.

ROSADO-SÁNCHEZ, JAVIER A. – *Assistant Professor*; DDS, 1995, Temple University.

ROURA-LUGO, NELSON - *Associate Professor*; DMD, 1971, University of Puerto Rico - Medical Sciences Campus.

SALAZAR-GONZÁLEZ, GERMÁN G. – *Associate Professor*; DMD, 1999, University of San Martín - Columbia.

SALCEDO-GONZÁLEZ, MARÍA I. - *Associate Professor*; DDS, 1979, National University of Colombia.

SÁNCHEZ-CASTELLANO, ARLENE - *Professor*; DMD, 1992, University of Puerto Rico - Medical Sciences Campus.

SÁNCHEZ-JAIME, NILDA M. - *Professor*; DMD, 1986, University of Puerto Rico - Medical Sciences Campus.

SÁNCHEZ-TORRES, MARIO - *Assistant Professor*; DMD, 2003, University of Puerto Rico - Medical Sciences Campus.

SANTA-NORIEGA, CARMEN A. - *Professor*; DMD, 1982, University of Puerto Rico - Medical Sciences Campus.

SANTIAGO-VERAY, JOSÉ J. - *Assistant Professor*; DMD, 2002, University of Puerto Rico - Medical Sciences Campus.

SILVA-COLL, JUAN R. – *Assistant Professor*; DMD, 1991, University of Puerto Rico - Medical Sciences Campus.

SOTO-GONZÁLEZ, ALISHA C. – *Assistant Professor*; DMD, 2021, University of Puerto Rico – Medical Sciences Campus.

SOTO-SINGALA, ANTONIO - *Professor*; DMD, 1978, University of Puerto Rico - Medical Sciences Campus.

SUÁREZ-IGARTÚA, JAIME R. - *Associate Professor*; DMD, 1990, University of Puerto Rico - Medical Sciences Campus; MD, 1996, Caribbean Central University - Puerto Rico**.**

TOLOSA-AGUILAR, JOSÉ J. – *Assistant Professor*; DMD, 2003, University of Puerto Rico – Medical Sciences Campus.

TORO-ALGARÍN, MILAGROS J. - *Associate Professor*; PhD, 2004, Indiana University; DDS, 1978, Central University of Venezuela.

TORRES-MAYMÍ, AILEEN M. - *Professor*; DMD, 1989, University of Puerto Rico - Medical Sciences Campus.

TORRES-SANTOS JULIANA M. - *Assistant Professor*, DMD, 2017 University of Puerto Rico - Medical Sciences Campus.

UZCATEGUI-MONCADA, UZKELIA C. - *Associate Professor*; DMD, 2002, Zulia University - Venezuela.

VARGAS-VIDOT, JOSÉ A. – *Assistant Professor*; MD, 1996, Eugenio María de Hostos University – Puerto Rico.

VELÁZQUEZ-QUINTANA, JANNETTE DEL P. - *Associate Professor*; DMD, 1990, University of Puerto Rico - Medical Sciences Campus.

VICÉNS-RODRÍGUEZ, JOSÉ C. – *Assistant Professor*; DMD, 2003, University of Puerto Rico - Medical Sciences Campus.

VICTORIA-PERALTA, YINAIRA DE LOS A. - *Assistant Professor*; DMD, 2005, University of Puerto Rico - Medical Sciences Campus.

VILLAMIL-SILVEY, JUANITA E. - *Professor*; DMD, 1982, University of Puerto Rico - Medical Sciences Campus.

ZORRILLA-DÍAZ, ENRIQUE - *Professor*; DMD, 1981, University of Puerto Rico - Medical Sciences.

SCHOOL OF PHARMACY

History

The School of Pharmacy of the University of Puerto Rico, originally established as a Department of Pharmacy, was founded on September 22, 1913 at the Río Piedras Campus, and in 1925 organized as the College of Pharmacy. The first twelve pharmacists graduated in 1915 from a two-year program. In 1928 the College implemented a four-year pharmacy program leading to the degree of Bachelor of Pharmaceutical Sciences. The College moved to a building of its own, named after Dr. Agustin Stahl, an eminent Puerto Rican botanist and scientist. In 1932, the College was accepted as a member of the American Association of Colleges of Pharmacy. In 1949, the College began its five-year Bachelor of Pharmaceutical Sciences program, being the second in the nation to adopt such a program. Pharmacy was the first health profession program to be offered at the higher education level in Puerto Rico, and the first to be accredited. The program was first accredited by the American Council for Pharmaceutical Education (ACPE) in 1952, and it has been accredited ever since.

The new trends in pharmacy practice and education, as well as the emphasis in clinical pharmacy prompted in 1977, the physical transfer of the College from the Río Piedras Campus to the Medical Sciences Campus (MSC) of the University of Puerto Rico. In 1989, the College changed its official name to School of Pharmacy. The Bachelor in Sciences in Pharmacy program with a greater emphasis in clinical education was offered from 1981 to 2003. A Master of Science in Pharmacy program with options in Industrial Pharmacy and Pharmaceutical Sciences (Medicinal Chemistry) was established in 1988, providing highly trained individuals for the pharmaceutical industry in the Island.

The development of new roles for pharmacists in patient care, in which they assume the responsibility of overseeing the effectiveness and safety of the pharmacotherapy undertook significant changes in pharmacy education. Thus, the Accreditation Council for Pharmacy Education (ACPE) required the doctoral degree as the entry-level for the profession. This led the School of Pharmacy to the implementation of the Doctor of Pharmacy program (Pharm D) in 2001, which is currently accredited by ACPE. The curriculum focuses on the development of general and professional abilities, the integration of theory and practice, as well as active and collaborative learning.

In 2001 a Pharmacy Practice Residency program, was established as a joint effort with Veterans Administration Caribbean Healthcare Center in San Juan. It is accredited by the American Society for Health System Pharmacists as a postgraduate year one pharmacy residency program. A postgraduate year one Community Pharmacy Residency program was established in 2012 as a joint effort between the School and four collaborating partners.

The School of Pharmacy is also a provider of continuing education since 1979. The Continuing Education and Professional Studies Division of the School of Pharmacy is accredited by the Health Professional Examining Boards of Puerto Rico as a continuing education provider for most health professionals in the Island.

MISSION STATEMENT

The mission of the School of Pharmacy of the Medical Sciences Campus of the University of Puerto Rico is to educate students, pharmacists and scientists who will improve the health of communities and individuals through the provision of pharmacist delivered patient care, interdisciplinary research and service; that contribute to the advancement of scientific knowledge and the pharmacy profession.

VISION

To be recognized as the leader academic institution in Puerto Rico for its excellence in pharmacy education, interdisciplinary research and service.

VALUES

- Dignity
- Integrity
- Respect
- Excellence
- Teamwork
- Responsibility
- Honesty
- Commitment
- Solidarity
- Innovation

ORGANIZATION AND ADMINISTRATION

The School is headed by the Dean, who is assisted by the Associate Dean for Academic Affairs, the Assistant Dean for Student Affairs, Assistant Dean for Research and Graduate Programs, and Department Heads for Pharmaceutical Sciences and Pharmacy Practice.

LOCATION AND FACILITIES

The physical facilities of the School of Pharmacy are located at the Medical Sciences Campus. Some teaching and research laboratories are located at the Guillermo Arbona Irizarry Building. The Center for Drug Information and Research is located at the Library of the Medical Sciences Campus. The School also maintains a Museum of Pharmacy and Medicinal Plants. The Dr. Esteban Nuñez Meléndez Medicinal Plants Garden is located at the University of Puerto Rico Botanical Garden in Río Piedras. The historical collection of the museum Dr. Luis Torres Díaz is also located at the Medical Sciences Campus, School of Pharmacy.

STUDENTS SERVICES

Office of Student Affairs

Student services are coordinated through the Office of Student Affairs. This office is responsible of providing academic, professional, personal and vocational counseling to all students. It serves as liaison between the students, faculty and administration. Among its objectives, it develops and maintains an environment that facilitates the academic performance of students. For additional information about its services, please contact Sacha Rivera, BCGP, Assistant Dean for Student Affairs (sacha.rivera1@urp.edu) .
Physical Address:

Office 248
Second Floor (Plaza level)
School of Pharmacy Building
Medical Sciences Campus
San Juan, PR 00931
Tel: (787) 758-2525, Ext. 5407, 5422
Fax: (787) 751-5680

School of Pharmacy Student Council

The School of Pharmacy Student Council is the official representative body of the students enrolled in the School of Pharmacy. It is composed of the presidents of each professional year class and nine representatives

elected from the student body. For more information, please contact Dr. Sacha Rivera (sacha.rivera1@upr.edu) at (787) 758-2525, ext. 5407.

ACADEMIC PROGRAMS

DOCTOR OF PHARMACY PROGRAM (Pharm.D.)

The Doctor of Pharmacy (Pharm D) program is a four-year program designed to prepare generalist practitioners who will render pharmaceutical care.

The program goals are:

- To foster the integral formation of students by developing their general and professional abilities along the curriculum.
- To foster the integration of knowledge based on professional practice experience in a systematic ability-based curriculum which incorporates the following areas: biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; pharmacy practice; and general education.
- To prepare competent pharmacists to enter the practice of the profession in different scenarios.

Program goals are in accordance with the scope of contemporary practice responsibilities and the emerging roles of pharmacists. The program requires the approval of 143 credits, exposing the student to 1890 hours of practical experiences. The curriculum follows a liberal, systematic, and humanistic model, which promotes human development through the development of general/professional abilities. The program offers a core of comprehensive abilities systematically developed as skills, attitudes, values, and conceptual knowledge, all of which are necessary in order to provide pharmaceutical care. The abilities, developed as a set of expectations at three levels of progress through the curriculum, are contextualized in the disciplines and practice that comprise the pharmacy profession. These are: Pharmaceutical Care, Critical Thinking, Problem Solving and Decision Making, Communication, Ethics, Social Interaction and Relations, Social Consciousness and Responsibilities, Intervention in Public Policy, Administration, and Self-Learning and Professional Development.

DOCTOR OF PHARMACY PROGRAM

Admission Requirements

Complete a minimum of 75 - 80 semester credits from among the following courses, or their equivalents, at any accredited college or university:

Courses	Credits
Basic English	6
Basic Spanish	6
Languages (English or Spanish)	3
Humanities	6
Social Sciences	6
Pre-calculus	4-6
Calculus I	4-5
General Chemistry	8

Organic Chemistry	8
General Biology	6
General Physics w/lab	8
Anatomy and Physiology	4-6
General Psychology	3
Introduction to Economics	3
Total	**75 –80**

- The advanced placement test will substitute the requisites of Basic English and Spanish.
- The three credits in languages (English or Spanish) must be taken in courses that develop oral and written communication skills.
- Humanities 3101 and 3102 (Introduction to Western Culture), offered by the UPR system, will be used as standard of reference. It does not include History of Puerto Rico.
- Mathematics credits through Calculus I are required for admission. Mathematics 3151 offered by the University of Puerto Rico System must be used as standards of reference. Calculus I should include integrals.
- General Biology does not include the Biological Sciences course offered by the General Studies Faculty of the University of Puerto Rico.
- Biology 3711 and 3712, offered by the University of Puerto Rico System, must be used as standards of reference for Anatomy and Physiology
- General Physics requirement is not satisfied by the Physical Sciences course offered by the General Studies Faculty of the University of Puerto Rico. Physics 3001, 3002, 3003, 3004 offered by the University of Puerto Rico System must be used as standards of reference.
- For Psychology may use PSIC 3005 offered by the University of Puerto Rico as reference.
- Economics course must include basic concepts of microeconomics.

To qualify for admission, applicants must present academic and personal records indicating good preparation and ability to undertake a professional college degree program. Applicants are required a general grade point average (GPA) of at least 2.75 (on a scale of 4.00), and a specific grade point average of at least 2.75 (on a scale of 4.00) in chemistry, mathematics, biology, and physics courses (sciences index). The applicant must submit three recommendation forms, two of which should be from former professors. Recommendations from the School of Pharmacy faculty will not be accepted. The most qualified candidates will be invited for a personal interview. Command of the Spanish and English languages is required. For more information about PCAT, access www.pcatweb.info.

Accreditation

The Doctor of Pharmacy program of the University of Puerto Rico is currently accredited by the:

Accreditation Council for Pharmacy Education
190 S. LaSalle Street, Suite 3000
Chicago, Illinois 60603 3446
Phone: (312) 664-3575
Fax: (866) 228-2631
Website: https://www.acpe-accredit.org/

DOCTOR OF PHARMACY CURRICULUM

TOTAL SEMESTER CREDIT-HOURS: 143

First Year: 35 credit-hours

FARM 7206	Scientific Foundations for the Professional Practice: Biochemistry	3.5
FARM 7166	Scientific Foundations for the the Professional Practice: Mathematics, Chemistry, and Physics	4
FARM 7116	Health Promotion and Disease Prevention	3
FARM 7105	Psychosocial Basis, Culture, and Management Theory-Practice Seminar I	3
FARM 7135	Research, Education, and Scientific Method Laboratory I	1
FARM 7117	Integrative Seminar of Pharmaceutical Care and Human Development I	3
FARM 7207	Scientific Foundations for the Professional Practice: Pathophysiology	3.5
FARM 7285	Scientific Foundations for the Professional Practice: Microbiology	1.5
FARM 7137	Compounding and Manufacturing of Dosage Forms I	3
FARM 7106	Psychosocial Basis, Culture, and Management Theory-Practice Seminar II	3
FARM 7136	Research, Education, and Scientific Method Laboratory II	1
FARM 7118	Integrative Seminar of Pharmaceutical Care and Human Development II	1
FARM 7115	Introductory Practicum	1.5
Electives		3

Second Year: 36 credit-hours

FARM 7225	Integrated Pharmaceutical Sciences and Therapeutic Agents I: Medicinal Chemistry and Pharmacology	7
FARM 7237	Compounding and Manufacturing of Dosage Forms II	3
FARM 7227	Pharmacy and the Health Care System	2
FARM 7205	Psychosocial Basis, Culture, and Management Theory-Practice Seminar III	2
FARM 7235	Research, Education, and Scientific Method Laboratory III	1
FARM 7217	Integrative Seminar of Pharmaceutical Care and Human Development III	2
FARM 7226	Integrated Pharmaceutical Sciences and Therapeutics Agents II: Medicinal Chemistry and Pharmacology	2.5
FARM 7229	Basic Biopharmaceutics and Pharmacokinetics	2.5
FARM 7228	Integrated Pharmaceutical Sciences of Anti- Infective Agents	2.5
FARM 7305	Health Policy and Pharmacy Law	3
FARM 7306	Psychosocial Basis, Culture, and Management Theory-Practice Seminar IV	2.5
FARM 7335	Research, Education, and Scientific Method Laboratory IV	1
FARM 7315	Integrative Seminar on Pharmaceutical Care and Human Development IV	1
FARM 7266	Service Learning Practicum	1
FARM 7275	Longitudinal Care Practice I	1
Electives		2

Third Year: 35 credit-hours

FARM 7331	Integrated Sciences, Therapeutics, and Patient Care I	7
FARM 7307	Psychosocial Basis, Culture, and Management Theory-Practice Seminar V	4
FARM 7336	Research, Education, and Scientific Method Laboratory V	1
FARM 7375	Longitudinal Care Practice II	1
FARM 7317	Integrative Seminar of Pharmaceutical Care and Human Development V	2

FARM 7332	Integrated Sciences, Therapeutics, and Patient Care II	7
FARM 7337	Research, Education, and Scientific Method Laboratory VI	1
FARM 7318	Integrative Seminar on Pharmaceutical Care and Human Development VI	1
FARM 7345	Management of the Practice and the Medication Distribution and Control Systems Practicum: Institutional Pharmacy	4
FARM 7346	Management of the Practice and the Medication Distribution and Control Systems Practicum: Community Pharmacy	4
Electives		3

Fourth Year: 37 – 40 credit-hours

FARM 7489	Inpatient Pharmaceutical Care: Acute Care in Specialized Practice **or**	
FARM 7488	Inpatient Pharmaceutical Care: General Medicine Practice	5
FARM 7497	Pharmaceutical Care in the Ambulatory Setting: Community Pharmacy Practice	5
FARM 7451	Selective Advanced Practice in Pharmacy	4-5
FARM 7498	Pharmaceutical Care in Ambulatory Setting: Institutional Practice	5
FARM 7452	Selective Advanced Practice in Pharmacy	4-5
FARM 7453	Selective Advanced Practice in Pharmacy	4-5
FARM 7454	Selective Advance Practice in Pharmacy	4-5
FARM 7487	Institutional Pharmacy Practice	5
FARM 7438	Doctor of Pharmacy Research Project	1

Experiential Education in the Doctor of Pharmacy Program

The professional experience component of the Doctor of Pharmacy Program consists of a series of structured experiential learning practices, which begin during the second semester of the first professional year. The program's mission is to develop pharmacy students' abilities by providing exemplary experiential learning opportunities through diverse practice scenarios; committed, adept preceptors; and interdisciplinary teamwork. The vision is to be recognized by our students, preceptors, and health-related institutions as a leader in pharmacy experiential education.

The experiences occur in a variety of settings which include hospitals, community pharmacies, and the pharmaceutical industry, among others. Students may need to complete experiential education at sites outside the San Juan metropolitan area. The practices are organized as a curricular progression leading to eight advanced practice experiences (five required and three selective) in the fourth professional year of the curriculum. A total of 1890 contact hours are distributed and offered in the curricular sequence, as they appear in the following table.

EXPERIENTIAL LEARNING PRACTICES

First Year

Introductory Practicum (54 hrs)	1.5 credits

Second Year

Service Learning (36 hrs)	1 credit
Longitudinal Care I (36 hrs)	1 credit

Third Year

Longitudinal Care II (36 hrs)	1 credit

Management of the Practice and the Medication Distribution and Control Systems Practicum: Community Pharmacy (144 hrs) 4 credits
Management of the Practice and the Medication Distribution and Control Systems Practicum: Institutional Pharmacy (144 hrs) 4 credits

Fourth Year

Advanced Practices (8 practices) (1440 hrs) 36 credits
Institutional Pharmacy Practice
Inpatient/general medicine
Acute Care
Community
Ambulatory Care in Health Institution
Selective Advanced Practices in Pharmacy

For additional information, please contact:
Larisa Nieves Alicea, RPh, MPHE, CHES
Experiential Program Director
larisa.nieves@upr.edu

Graduation Requirements

Students will receive a Doctor of Pharmacy (Pharm D) degree upon completion of the following requirements:

- Approve all required courses (143 semester credits). The required and elective courses must be approved with a grade of C or above, i.e., a minimum grade point average of 2.00 (on a scale of 4.00).
- Present a portfolio that shows the student´s development of the ten (10) general and professional abilities of the program.
- Demonstrate professional and ethical conduct.
- Complete at least the last two (2) years of studies at the School of Pharmacy of the University of Puerto Rico.
- Complete the academic program within a maximum of six (6) years from the time of admission.
- Comply with all applicable regulations established by the University of Puerto Rico Medical Sciences Campus.

POSTGRADUATE YEAR ONE PHARMACY RESIDENCY PROGRAM

The Pharmacy Residency Program Post Graduate Year 1 (PGY-1) at the VA Caribbean Healthcare System is a collaborative program between the School of Pharmacy of the University of Puerto Rico (UPR) and the VA Caribbean Healthcare System. It is accredited by the American Society of Health System Pharmacists (ASHP). The program consists of a 12-month period of concentrated training in all aspects of pharmacy practice. It is a structured training program in which service complements the educational and experiential objectives of the residency. Formal policies and procedures for site, preceptors, and residents evaluations are in place. The learning experiences are provided according to the level and type of experiences specified in the broad competency areas established for the program. The program is flexible, in that it will adapt to the needs of the individual resident; yet it will provide the basic foundation for quality pharmacy practice. The ultimate goal of the program is to enhance the resident's competence and skills in patient care, as a productive member of a health care team and to obtain in depth working knowledge of all other areas of clinical and administrative pharmacy practice. A Teaching and Learning Curriculum (TLC) in-Academia is also offered to interested residents as a parallel optional opportunity.

Program Goals

1. In collaboration with the healthcare team, provide safe and effective patient care to a diverse range of patients, including those with multiple comorbidities, high risk medication regimens and multiple medications following a consistent patient care process
2. Ensure continuity of care during patient transitions between care settings
3. Prepare, dispense and manage medications to support safe and effective drug therapy for patients
4. Demonstrate ability to manage formulary and medication-use processes, as applicable to the organization
5. Demonstrate ability to evaluate and investigate practice, review data, and assimilate scientific evidence to improve patient care and/or the medication –use system
6. Demonstrate leadership skills
7. Demonstrate management skills
8. Provide effective medication and practice related education to patients, caregivers, healthcare professionals, students and the public (individuals and groups)
9. Effectively employ appropriate preceptor roles when engaged in teaching students, pharmacy technicians, or fellow health care professionals

Learning Experiences

- Orientation and assessment
- Direct patient care rotations
- Practice management
- Teaching experience
- Service/staffing rotation and weekends
- Investigational drug services
- Direct patient care experiences include
    - Acute care/Internal medicine
    - Critical care
    - Emergency Medicine
    - Antimicrobial stewardship
    - Cardiology
    - Mental health
    - Extended care unit
    - Anticoagulation management program
    - Primary Care Patient-aligned care teams
    - Pain and palliative care
    - Oncology
    - Home based primary care (HBPC)
    - Infectious Diseases
    - Transitions of Care

Residents' Responsibilities

Each resident will be required to:

- Complete all required learning experiences
- Complete a residency project
- Present the residency project results at the VACHS and prepare a manuscript suitable for publication
- Participate in the quarterly pharmacy newsletter

- Complete at least one medication use evaluation
- Prepare a drug class review, monograph, treatment guideline or protocol
- Comply with the service commitment requirements
- Actively participate in one pharmacy service committee
- Present two formal conferences to the pharmacy staff
- Actively participate in residency conferences and educational activities
- Prepare a portfolio of his/her practice and development, including a final self-reflection

Benefits

- Stipend
- 35 accrued leave time: 13 personal days, 13 sick leave & 9 holidays
- Administrative leave for educational meetings
- Parking
- Complimentary lab coats
- Health and life insurance
- Teaching hospital

Certificate

A certificate of residency accredited by ASHP is awarded to the residents who successfully complete the residency program.

Requirements

- Participation in the NMS Resident Matching Program and PhORCAS (Pharmacy Online Residency Centralized Application Service)
- Academic: Doctor of Pharmacy (Pharm. D) degree from an accredited college /school of pharmacy and college transcript
- Licensure eligibility or licensure to practice pharmacy in a State, Territory, Commonwealth of the United States (ie. Puerto Rico) or the District of Columbia.
- Nationality: U.S. citizenship
- Interview: An on-site panel interview
- Letters of recommendation: Three formal letters using established format
- Letter of intent essay expressing interest and the reason for pursuing a residency
- Curriculum Vitae
- Language: Fully bilingual (Spanish and English).

Address all inquiries and application materials by January 15th of each year to:

Iadelisse Cruz-González, PharmD, BCGP
PGY1 Pharmacy Residency Program Director
University of Puerto Rico, School of Pharmacy
PO Box 365067
San Juan, PR 00936-5067
Tel. (787) 758-2525 Ext. 5300, 5301
E-mail: iadelisse.cruz@upr.edu

POSTGRADUATE YEAR ONE COMMUNITY-BASED PHARMACY RESIDENCY PROGRAM

The University of Puerto Rico School of Pharmacy Community Pharmacy Residency (U.P.R.-CPRP) is a 12-month program which promotes the continued development and enhancement of the pharmacists' direct patient care, teaching, and research skills, contributing at the same time to the evolution and progress of the pharmacy profession in Puerto Rico. U.P.R.-CPRP is accredited by the American Society of Health System Pharmacists (ASHP) and the American Pharmacists Association (APhA).

U.P.R.-CPRP has been developed with a contribution of the National Association of Chain Drug Stores Foundation (NACDS Foundation) through its CPRP Expansion Project 2012-13 and agreements between four companies and the U.P.R. School of Pharmacy. Walgreens, Farmacias Caridad, Farmacia San José-Lares and Hospital General Castañer-Lares have made it possible to provide structured training to 4 community pharmacy residents, until residency year 2017-2018. The program was accredited in 2014 after graduating the first 2 residents. The accreditation was continuously extended until 2023. The program paused in residency year 2021. U.P.R.-CPRP reinitiated for the residency year 2024-25 with 2 residents. The ASHP (American Society of Health-System Pharmacists) acknowledged the Accreditation Candidate Status on August 29, 2024 and is currently in the evaluation process to grant the Accredited Status.

U.P.R.-CPRP provides opportunities to two residents in partnership with: Farmacia Santa Cruz PharmaCare in San Juan, P.R and Farmacia Sagrado Corazón Express in Sabana Grande, Puerto Rico. The residency provides a postgraduate training opportunity for pharmacists to enhance their skill set in the community pharmacy setting. The program is financially supported by both pharmacies, and academically affiliated, and financially supported, in part, by the University of Puerto Rico School of Pharmacy. The residency provides a postgraduate training opportunity for pharmacists to enhance their skill set in the community pharmacy setting. The program is financially supported by both pharmacies, and academically affiliated, and financially supported, in part, by the University of Puerto Rico School of Pharmacy. The residency will allow the pharmacist to build on their professional skills by providing a variety of patient care services. Pharmacists in this setting will have a direct influence on patient outcomes through participation in medication reconciliation, transitions of care, patient counseling, immunization services, compounding pharmacy services and medication therapy management with a specific emphasis on patient adherence and disease management. Residents will also work to develop collaborations with other health care providers to improve the health care in our communities. The residency program graduates will be leaders in the pharmacy community and will have an active role in advancing community pharmacy practice.

Residents are required to fulfill 4 Competencies following a planned structure of goals, educational objectives, and instructional objectives. Residents have a variety of supervised opportunities in medication distribution and management, patient care, teaching, and research to encourage and contribute to their continued enhancement of their capabilities to the optimal level. Graduated Residents are expected to become leaders within the pharmacy profession and to continue expanding community pharmacy services around the island of Puerto Rico.

Purpose Statement

PGY1 Community-Based Pharmacy Residency Program Purpose is to build upon the Doctor of Pharmacy (PharmD) education and outcomes to develop pharmacist practitioners with knowledge, skills and abilities as defined in the educational competency areas, goals and objectives. Residents who successfully complete PGY1 residency programs will be skilled in diverse patient care, practice management leadership, and education and be prepared to provide patient care, seek board certification in pharmacotherapy (ie. BCPS) and pursue advanced education and training opportunities including postgraduate year two (PGY-2) residencies.

The U.P.R. Community Pharmacy Residency Program graduates are able to provide clinical pharmacy services and collaborate with researchers in the community pharmacy setting, and contribute to the academic needs of the faculty of a school of pharmacy.

The U.P.R. Community Pharmacy Residency Program trains Residents to:

- become leaders who are capable to apply their knowledge, skills, and attitudes to develop and enhance direct patient care services, and health promotion and disease prevention services at the community pharmacy;
- contribute to the education and development of pharmacy students, and other colleagues and professionals;
- integrate clinical research to the community pharmacy.

Program Competencies

- Patient Care
- Practice advancement
- Leadership
- Advancement of Community-based Practice and Improving Patient Care
- Teaching and Education

Learning Experiences and Residents' Responsibilities

Community Pharmacy

- Pharmacy services development and enhancement.
- Development of new patient services to contribute to your community health needs.
- Collaboration with and contribution to the services already established at the pharmacy.
- Pharmacy staffing (includes 16 hours of nights and weekends shifts).
- Development or enhancement of Medication Therapy Management (MTM) Services.
- Development or enhancement of Immunization Services.
- Chronic disease education and monitoring services development or enhancement (diabetes, hypertension, dyslipidemia, anticoagulation, HIV among others).
- Health promotion and disease prevention community services coordination.
- Administrative activities.
- Special population services development and enhancement.
- Pharmacy staff drug information teaching (In-Services).
- Pharmacy related publishing.

Academia

- Academic Certificate Program completion upon resident interest
- Contribution to Pharmacists and the Pharmacy Profession continued development.
- Pharm. D. Candidates teaching, supervision, and modeling
- Pharmacists, Pharmacy Technicians Physicians and other health care providers' professional education.

Research

- Research development directed to the population served.

- Clinical services research development and performance.
- Research presentation at National Meetings
- Publishing of research results.
- Business plan development directed to develop a new service or enhance an established service.

U.P.R. School of Pharmacy Faculty Support

- U.P.R. Residency Director.
- Research supervision and development advising by the U.P.R.
- Drug Information and Research.
- Business Plan development support.
- Academic Certificate Program Coordination.

Benefits

- Stipend: $41,200.00 (plus benefits).
- 22 accrued leave time: 10 personal days, 7 sick leave & 5 holidays.
- Administrative leave: Pharmacy and Law Boards, Research Presentation.

Candidate Requirements:

- Professional degree in Pharmacy from a college or school of pharmacy accredited by the Accreditation Council for Pharmacy Education
- Pharmacist license within 90 days of starting the residency program to be able to complete 2/3 of the residency training with the required pharmacy license to practice in Puerto Rico.
- Submission of residency application materials to Pharmacy Online Residency
- Centralized Application Service (PhORCAS) – www.ASHP.org/PhORCAS

    - Completed application
    - Curriculum Vitae
    - Three professional letters of recommendation
    - Official College or School of Pharmacy transcripts
    - Letter of intent

- On-site interview (upon invitation)
- Registration with the National Matching Services (NMS) https://natmatch.com/ashpmatch.html

Certificate

An ASHP/APhA accredited residency certificate is awarded to the residents who successfully complete all residency program requirements.

For more information or specific questions about the UPR Pharmacy Residency Programs, please, contact:

Francisco Javier Jiménez, PharmD., BCPS, CDCES
Professor Residency Program Director
Community Pharmacy Residency Program
University of Puerto Rico School of Pharmacy
P.O. Box 365067, San Juan, Puerto Rico 00936-5067

Phone: (787) 758-2525 x 5300
Mobile.: (787) 382-1383
Emails: CommunityPharmacyResidency.RCM@upr.edu or francisco.jimenez3@upr.edu .

MASTER OF SCIENCE IN PHARMACY PROGRAM

Note: The Master of Science in Pharmacy programs have a moratorium status.

The School of Pharmacy graduate program was approved in 1986 by the Council on Higher Education of Puerto Rico. The first class was admitted in academic year 1987-1988. A Master of Science in Pharmacy degree is offered with two options of study: Pharmaceutical Sciences and Industrial Pharmacy. Classes for both options usually convene during evening hours and thus making possible for persons already employed to obtain an advanced degree. Both options require 40 trimester credit-hours for graduation, including original research work presented as the student's thesis.

The main goal of the Master of Science in Pharmacy program is to provide advanced training in industrial pharmacy and pharmaceutical sciences. Within the context of this general goal, the specific program objectives are to:

- Offer an opportunity for individuals to advance their knowledge in specific areas of industrial pharmacy.
- Prepare individuals for research and teaching positions requiring personnel with a strong background in the pharmaceutical sciences.
- Develop individuals with the research skills needed to carry out basic and applied studies.
- Address the pharmaceutical needs of Puerto Rico.

The Industrial Pharmacy option is geared towards understanding the scientific principles involved in techniques employed in the pharmaceutical industry. To accomplish this goal, the program offers courses in Advanced Physical Pharmacy, Biopharmacy and Pharmacokinetics, Pharmaceutical Unit Operations, Pharmaceutical Quality Control, Instrumental Pharmaceutical Analysis, and Pharmaceutical Technology. An additional four (4) trimester credits are dedicated to electives. The student's research project integrates the scientific principles taught in the theoretical courses, thus leading to an original scientific contribution to the area of pharmaceutics, published as a thesis work. Many of the student research projects are subsequently submitted to leading scientific journals. The graduate is qualified to assume responsibilities in numerous areas that encompass the pharmaceutical industry, or pursue a Ph.D. degree.

The Pharmaceutical Sciences option offers courses in Medicinal Chemistry, Instrumental Pharmaceutical Analysis, Pharmacognosy and Natural Products, Physical Pharmacy, and Biological Chemistry. An additional ten (10) trimester credits are dedicated to electives. Furthermore, the student through her/his research project may have access to methods of identification and purification using advanced instrumental techniques such as: gas chromatography, HPLC, NMR, gas chromatography- mass spectrometry, and other hyphenated methods of analysis. The student's research project integrates the scientific principles taught in the theoretical courses, leading to an original scientific contribution to the area of pharmaceutical sciences, published as a thesis work. Many of the student research projects are subsequently submitted to leading scientific journals. The knowledge and experience obtained will enable the graduate to perform successfully in the pharmaceutical industry, research laboratories, and other related areas. Alternatively, the graduate will be prepared to pursue a Ph.D. degree.

Admission Requirements

- A Doctor of Pharmacy degree, baccalaureate degree in Pharmacy or in one of the physical, chemical, biological, or engineering sciences.
- A grade point average of 3.00 or higher (scale of 4.00).
- GRE scores.
- Interview required.

Meeting all admission requirements, including the interview, does not guarantee admission to the program. Student admission is based on space availability and points obtained according to the admission formula. Students should be fluent in Spanish and English since courses may be taught in either language.

Graduation Requirements

The student must satisfy all the requirements stated in the School of Pharmacy Norms and Procedures for the Master of Science. The minimum requirements include:

- Completion of 40 trimester credit hours, within five consecutive years. A maximum of six credits, if deemed acceptable by the Graduate Committee, may be transferred from another accredited institution.
- Completion of all required courses in a satisfactory manner with an overall grade point average of at least 3.00.
- Submission of an original research project and defense of a thesis.
- Demonstrate adequate knowledge in the specialty area by successfully passing an oral examination.
- Submission of bound copies of the thesis in its final form.

MASTER OF SCIENCE IN PHARMACY (INDUSTRIAL PHARMACY OPTION) CURRICULUM
Total Trimester Credit-Hours: 40 (moratorium status)

General Core: 6 credit hours

FAGG 6100	Statistics in Pharmacy	2
FAGG 6200	Drug Literature Evaluation	2
FAGG 6300	Principles of Research Design	2

Industrial Pharmacy Core: 24 credit hours

FAQM 6351	Instrumental Pharmaceutical Analysis I	2
FAQM 6352	Instrumental Pharmaceutical Analysis II	2
FAFI 6311	Advanced Physical Pharmacy I	2
FAFI 6312	Advanced Physical Pharmacy II	2
FAFI 6321	Pharmaceutical Unit Operations I	2
FAFI 6322	Pharmaceutical Unit Operations II	2
FAFI 6511	Industrial Pharmaceutical Technology I	2
FAFI 6512	Industrial Pharmaceutical Technology II	2
FAFI 6400	Seminar in Industrial Pharmacy	2
FAFI 6600	Pharmaceutical Quality Control	2
FAFI 6700	Advanced Biopharmaceutics and Pharmacokinetics	2
FAFI 6313	Advanced Physical Pharmacy III	2

Electives		4

Research and Thesis: 6 credit hours

FAGG 6800	M.S. Research*	2
FAGG 6900	Thesis	2

*Must be taken at least twice to receive 4 credits. If taken more than twice, only 4 credits will be credited toward the degree.

MASTER OF SCIENCE IN PHARMACY (PHARMACEUTICAL SCIENCES OPTION) CURRICULUM
Total Trimester Credit-Hours: 40 (moratorium status)

General Core: 6 credit-hours

FAGG 6100	Statistics in Pharmacy	2
FAGG 6200	Drug Literature Evaluation	2
FAGG 6300	Principles of Research Design	2

Pharmaceutical Sciences (Medicinal Chemistry)
Core: 18 credit-hours

FAQM 6351	Instrumental Pharmaceutical Analysis I	2
FAQM 6352	Instrumental Pharmaceutical Analysis II	2
FABI 6311	Advanced Biological Chemistry I	2
FAQM 6705	Seminar in Medicinal Chemistry	2
FAFI 6311	Advanced Physical Pharmacy I	2
FAQM 6701	Medicinal Chemistry I	2
FAQM 6702	Medicinal Chemistry II	2
FAQM 6703	Medicinal Chemistry III	2
FAQM 6707	Pharmacognosy and Natural Products	2

Electives		10

Research and Thesis: 6 credit hours

FAGG 6800	M.S. Research*	2
FAGG 6900	Thesis	2

*Must be taken at least twice to receive 4 credits. If taken more than twice, only 4 credits will be credited toward the degree.

DOCTOR OF PHARMACEUTICAL SCIENCES (PH.D.)

The Doctor of Philosophy in Pharmaceutical Sciences Program aims to provide students with a comprehensive understanding of the discovery and development and manufacturing of pharmaceutical drugs, and their involvement in the treatment of disease.

Mission

To educate students who will improve the quality of life of the community through interdisciplinary research that will advance scientific knowledge in pharmaceutical sciences.

Graduate Profile

1. Critical thinking
2. Problem solving and decision making
3. Communication and informatics
4. Ethics
5. Ability to work independently and in group settings
6. Self-learning
7. Leadership

Employment Opportunities

Though its graduate profile, the Ph.D. program will develop leaders of innovation and research in the pharmaceutical sciences. The program will provide the opportunity to develop the body of knowledge and skills needed to be successful in future employment in:

- Pharmaceutical industry
- Government
- Academia

Admission Requirements

Minimum requirements: B.S. or M.S. degree from an internationally recognized institution. The applicant should be a major in one of the following fields: Biology, Biochemistry, Chemistry, Chemical Engineering, Cellular and Molecular Biology, Pharmacy or Pharmaceutical Sciences. In special cases, Bachelor or Master´s degrees in other related fields can be considered. In these cases, before submission of the application, the student will be encouraged to request approval from the Assistant Dean of Graduate Programs.

- Required Courses: Organic Chemistry, Calculus I, Physics.
- Recommended Courses: Biology, Biochemistry, Genetic.
- Additional requirements: Average GPA of 3.0 or above; Completion of a GRE examination within the last three years; Three letters of recommendation; Proficiency in English; Interview by the Graduate Committee (when invited).

Graduation Requirements

In order to obtain the Doctor of Philosophy in Pharmaceutical Sciences Degree, the student must have completed all 60 credits of the Program and comply with the following requirements:

- Have completed all Core Courses: 22 Credits
- Have completed all Mentor-driven Courses and Elective Courses for each Directed electives: 14 Credits
- Have completed the required Elective Course: 3 credits
- Have completed the required Research credits: 18 Credits
- Have completed writing and oral defense of the Thesis: 3 Credits
- Students are required to approve all courses with A or B and maintain a GPA of 3.0 or higher.
- Have completed the Research Proposal
- Have completed the Qualifying Examination
- Have successfully completed a competitive research project
- Have presented the results of their research activities in local or international symposia

- Have published at least one manuscript, and submitted one other manuscript for publication in peer-reviewed journals

DOCTOR OF PHARMACEUTICAL SCIENCES (PH.D.) CURRICULUM

The programs consists of 60 credits as follows:

Core Course	Credits
PHSC 8516-Principles of Pharmaceutical Sciences	3
PHSC 8338-Business, Quality and Project	3
PHSC 8447-Principles of Drug Discovery and Drug Development	3
PHSC 8116-Advanced Instrumental Analysis	3
PHSC 8236-Applied Biostatistic	3
PHSC 8335-Ethics in Research	2
PHSC 8425-Laboratory Rotation	1
PHSC 8602-Seminar I	1
PHSC 8602-Seminar II	1
PHSC 8600-Principles In Research Design	2
Specialized Courses	17
Research	18
Thesis	3

After completion of the core courses, students will enter a mentor-driven, individualized program for their further development, in which they can specialize in one of three tracks. The student will select one of the tracks and carry out a competitive and innovative research project in the area, leading to a Doctoral Thesis. The three different tracks that initially will be offered are:

Medicinal Chemistry and Pharmacognosy
Molecular Pharmacology and Pharmacogenomics
Pharmaceutics and Drug Delivery

COURSE DESCRIPTIONS

First Professional Level: Doctor of Pharmacy (Pharm D)

FARM 7101 - Development of Advanced Interventions in Health Communications. Three (3) credits. Pre-requisites: FARM 7106.
In this course the student will have the opportunity to develop and apply concepts of health communication with emphasis on pharmaceutical care. The student will develop and implement a communication plan to address a health problem or an issue related to the safe and effective use of medications. Course instructional activities will provide the students the opportunity to examine their oral/written communication skills and develop a plan that addresses aspects to improve.

FARM 7105 - Psychosocial Basis, Culture, and Management Theory-Practice Seminar I. Three (3) credits.
The Psychosocial Basis, Culture, and Management Theory-Practice Seminar systematically and progressively integrates the psychosocial basis of the liberal professional curriculum. The seminar will be developed throughout five academic semesters during the first two and a half years of the Program. In this course of the first semester of the first professional year, the foundations and basic concepts of ethics and bioethics are studied. In addition, the student will have the opportunity to be exposed and to expand into aspects of culture and historical processes through the pharmaceutical anthropology unit. The student will start to develop the following major concepts: psychosocial basis, culture, and professional practice.

FARM 7106 - Psychosocial Basis, Culture, and Management Theory-Practice Seminar II. Three (3) credits. Pre-requisite: FARM 7105.
In this course of the second semester of the first professional year, the unit of psychosocial foundations presented in an introductory manner in the Psychosocial Basis, Culture and Management Theory-Practice Seminar I, will be further developed. The student will apply the concepts of professional ethics. In the contents of communication the student will have opportunity to expand, deepen and apply concepts of communication in health with emphasis on pharmaceutical care. Active learning strategies and methodologies as well as conference will be used.

FARM 7107 - Introduction to the use of Microcomputers and its Applications. Three (3) credits.
In this course of the First Professional Year, the main concepts of information systems, particularly the microcomputer, are developed. The course also includes discussion and practice of the main applications of microcomputers. These ones include word processing, spreadsheets, presentations, data base handling and telecommunications, including access to e-mail, world wide web and remote computers. The Microsoft Office Package is used as the main software for the course. Educational experiences are developed through the use of active learning methodologies. In this course active learning methodologies will be used.

FARM 7108 - Non-Parametric Statistics for Health Professions. Three (3) credits. Pre-requisites: Precalculus and Differential Calculus Course.
The course presents the basic concepts of statistical inference related to hypothesis testing and statistical methods for non-normal variables. These methods represent an alternative to traditional parametric methods, for which normality is essential. Applications to research in Health Science area are presented. Statistical packages as well as online interactive calculators available at the World Wide Web are used along with the traditional hand solving methods for mathematical problems. Active learning strategies and methodologies are used.

FARM 7115 - Introductory Practicum. One and a half (1.50) credits. Pre-requisites: FARM 7166, FARM 7116, FARM 7105, FARM 7135, FARM 7117, FARM 7206.
This practice is designed to provide the student an ample vision of the science and the profession of pharmacy and existing career opportunities. The student observes, practices, and analyzes, according to his/her level of development, the responsibilities and activities that pharmacist carry out in a variety of settings, with emphasis on those as members of a team. The student practices in community pharmacy, health system pharmacy and in a non-traditional setting (pharmaceutical industry, drug wholesaler, specialized pharmacy, among others). Students gather in group sessions in the classroom before and after visiting each scenario. Active learning strategies and methodologies are used.

FARM 7116 - Health Promotion and Disease Prevention. Three (3) credits.
This course corresponds to the block of the Drug, Health and Public Policy Seminar. The course develops the concept of health-disease in a progressive way. It analyzes the health environment and the natural history of diseases. It incorporates the study of epidemiological strategies, population aspects and vital statistics. The challenges and strategies of the intervention of the pharmacist in Public Health, with emphasis in health promotion and disease prevention are discussed. These contents will be developed with the ECA, problem posing and PBL strategies.

FARM 7117 - Integrative Seminar of Pharmaceutical Care and Human Development I. Three (3) credits.
The Integrative Seminar I constitutes the unifying center of the curriculum. The student is introduced to the professional practice of Pharmaceutical Care and to how to implement the pharmacists' patient care process. In this Seminar, ten abilities are studied and applied, and the main knowledge and skills acquired in the other courses are incorporated progressively. In addition, basic concepts of interprofessional education are introduced and practiced. The Seminar guides the student in the preparation of the portfolio, which documents the development of the abilities throughout the academic experiences. During the first semester of the first professional year, the student will be introduced to: the abilities as an object of study, the philosophy of pharmaceutical care and the conceptualization of the practice of Pharmaceutical Care. The seminar fosters the reflection between the educator and the student by methodologies of active learning.

FARM 7118 - Integrative Seminar of Pharmaceutical Care and Human Development II. One (1) credit. Pre-requisites: FARM 7117.
This seminar continues with the conceptualization of pharmaceutical care and the implementation of the pharmacists' patient care process. It also integrates in a progressive manner the ten abilities to the concepts learned in other courses. The Seminar continues to guide the student in the preparation of the portfolio that demonstrates the development of the abilities throughout the curricular experiences. The Seminar emphasizes the integration of the concepts learned in other courses, so that the student can understand the importance of the scientific basis in the practice of pharmaceutical care. The abilities of pharmaceutical care, problem solving, critical thinking and self-learning will be emphasized. The Seminar fosters the students' reflective process by incorporating teaching strategies and methodologies that emphasize active learning.

FARM 7135 - Research, Education, and Scientific Method Laboratory I. One (1) credit. Co-requisites: FARM 7105, FARM 7166.
The research, education, and scientific method laboratory will approach education, research, and the scientific method in an integrated fashion. The course will be developed along the four year of studies. In the first semester of the first professional year, the student will be exposed in an introductory fashion to the basic terminology of the concept of education and research. The students will applied the fundamentals of chemistry and mathematics and the scientific method. Educational experiences will be develop using strategies such as: Problem Based Learning (PBL), Exploration, Conceptualization and Application (ECA) and Problem Posing.

FARM 7136 - Research, Education, and Scientific Method Laboratory II. One (1) credit. Pre-requisites: FARM 7105, FARM 7135, FARM 7166, FARM 7206. Co-requisite: FARM 7106.
This course of the second semester of the first professional year will continue to develop in more depth the concepts of education presented in the course research, education, and scientific method laboratory. The student will be exposed to experiences related to the professional practice. Physical pharmacy fundamentals and the scientific method will be applied. The concept of research will be further study, with a particular emphasis in quantitative and qualitative research. Educational experiences will be developed through strategies such as Problem Based Learning (PBL), Exploring, Conceptualization and Application (ECA) and Problem Posing.

FARM 7137 - Compounding and Manufacturing of Dosage Forms I. Three (3) credits. Pre-requisites: FARM 7166, FARM 7135. Co-requisites: FARM 7136.
This course starts with the development of the concept of dosage forms, the technological and scientific principles of these preparations and drug delivery systems and their use in patient care. Principles of physical pharmacy, administration routes, products design: preformulation and formulation, compounding and manufacture with emphasis in the application of pharmaceutical products in patient care are integrated. This course emphasize solid dosage forms, like powders, granules, tablets and capsules, ophthalmic, nasal, and otic dosage forms, oral and topical solutions and parenteral products. Laws and regulations applicable to research, drug product development, manufacturing practice and compounding practice standards, and the regulatory process by which pharmaceutical are approved for marketing are examined. Educational experiences will be developed through the use of active learning methodologies.

FARM 7145 - Readings in Pharmacology I. Three (3) credits. Pre-requisite: FARM 7135. Co-requisites: FARM 7136.
The First Professional Year elective course, will direct students in the analysis and evaluation of scientific papers in the field of Pharmacology. All students will be exposed to principles involved in analyzing and critically evaluating scientific literature under the direction of the professor. Subsequently each student will select a topic of interest from a list (containing a short bibliography for each topic) provided by the professor. Each student will make an oral presentation to the class, demonstrating his/her mastery of analytic and evaluative skills, of at least one item of primary literature related to the selected topic. A final written report, taking into consideration feedback from the presentation, will be submitted before the end of the course. Educational experiences will be developed through the use of active learning methodologies.

FARM 7146 - Enzyme Organization. Two (2) credits. Pre-requisite: FARM 7136.
This seminar promotes an understanding of the relationship between the different levels of enzyme organization and the enzyme function in cellular metabolism, as well as possible pharmaceutical implications of this knowledge. The student will develop theorical tools for the initial understanding of this topic, through the study and analytical discussion of scientific papers and of some illustrative examples, which will form the basis for the required project.

FARM 7147 - Readings in Pharmacognosy I. Three (3) credits. Pre-requisites: FARM 7135. Co-requisites: FARM 7136.
This First Professional Year elective course, will direct students in the analysis and evaluation of scientific papers in the field of Pharmacognosy. All students will be exposed to principles involved in analyzing and critically evaluating scientific literature under the direction of the professor. Subsequently each student will select a topic of interest from a list provided by the professor. Each student will make an oral presentation to the class, demonstrating his/her mastery of analytic, evaluative and communication skills, of primary literature related to the selected topic. A final written report, taking into consideration feedback from the presentation, will be submitted before the end of the course. Educational experiences will be developed through the use of active learning methodologies.

FARM 7155 - Topics in Pharmaceutical Sciences I. Three (3) credits. Pre-requisites: FARM 7125, FARM 7135. Co-requisites: FARM 7126, FARM 7136, FARM 7137.
This elective course of the First Professional Year will enable the student to study according to his conceptual level, and in more depth topics related to new development and approach in the Pharmaceutical Sciences. Educational experiences will be developed through the use of active learning methodologies.

FARM 7157 - Health Topics Impacting Society I. Three (3) credits. Pre-requisites: FARM 7105, FARM 7116. Co-requisite: FARM 7106.
This elective course of the First Professional Year will enable the student to study according to his conceptual level, and in more depth current topics in the Social Sciences and Public Health impacting the society and individual and community health. The role of the pharmacist as a professional and citizen will be studied in the context of the selected topic. Educational experiences will be developed through the use of active learning methodologies.

FARM 7166 - Scientific Foundations for the Professional Practice: Mathematics, Chemistry, and Physics. Four (4) credits.
Fundamentals of Mathematics, Chemistry, and Physics applied to Pharmacy developed and integrated during the First Semester of the First Professional Year are discussed in this course. Topics discussed includes Drug Analysis, Drug Chemical-Physical Properties, Pharmaceutical Calculations, Mathematical Functions, Models and Graphs, among others. Active and participatory learning, as well as progressive integration with professional practice, are foster in order to develop concepts, attitudes and values. Teaching strategies and methodologies such as: Problem Based Learning (PBL), Exploration, Conceptualization and Application (ECA) and problem posing and lectures are used.

FARM 7175 - Health Promotion and Disease Prevention in Disaster Management. Three (3) credits. Pre-requisites: FARM 7105, FARM 7116. Co-requisite: FARM 7106.
This elective course of the First Professional Year will enable the student to study in more depth different types of disasters and its management, being this topic one that impacts society, individual and community health. The student is exposed to the Health System and to the Pharmacy subsystem in the context of structure, organization and planning of disaster management. Environmental and mental consequences are examined in the occurrence of disaster as well as essential drugs. Actual topics such as The Resurgence of Infectious Diseases and Bioterrorism are discussed. The role of the pharmacist as a health professional and citizen is examined in the context of disaster management. Educational experiences will be developed through active learning methodologies.

FARM 7205 - Psychosocial Basis, Culture, and Management Theory-Practice Seminar III. Two (2) credits. Pre-requisite: FARM 7106.
The Psychosocial Basis, Culture and Management Theory-Practice Seminar, integrates progressively and systematically the psychosocial foundations of the professional-liberal curriculum. This seminar develops during the five academic semesters of the first two years and a half of the program of studies. The psychosocial foundations concept is study in depth, particularly through sub concepts, such as: ethics applied to the professional practice, analysis and management of ethical situation, health sociology and pharmaceutical sociology in health care systems. Educational experiences will be developed through the use of active learning methodologies.

FARM 7206 - Scientific Foundations for the Professional Practice: Biochemistry. Three and a half (3.50) credits.
In this course students learn about the structure, biochemical properties and function of the biomolecules (proteins, carbohydrates, lipids and nucleic acids). The course includes the study of enzymes, major metabolic pathways, mechanisms of metabolic regulation, the genetic code, as well as gene expression and regulation.

Emphasis is given to biochemical disorders that cause medical conditions and possible therapeutic interventions within the metabolic pathways. The course promotes active learning that favors the development of knowledge at the conceptual, attitudinal, and values levels. Active learning methodologies such as illustrated lecture and cooperative learning, among others are utilized.

FARM 7207 - Scientific Foundations for the Professional Practice: Pathophysiology. Three and a half (3.50) credits. Pre-requisites: Courses of the first semester of the first professional year.
This course studies the biological and physical manifestations of diseases in relation to subjacent physiologic anomalies. Illnesses of major prevalence and relevance to the pharmacy profession will be studied. This course promotes active learning and integrates the practice of pharmacy in a gradual manner in order to develop concepts, skills, attitudes and values. Active learning strategies such as Exploration, Conceptualization and Application (ECA), Problem Based Learning (PBL) and Problem Posing will be utilized.

FARM 7208 - Principles of Drug Discovery and Drug Development. Three (3) credits. Pre-requisites: FARM 7166, FARM 7206, FARM 7105, FARM 7116, FARM 7135, FARM 7117.
This elective course focuses on the fundamental aspects and current methodologies involved in the discovery and drug development process. The fundamental aspects include the physicochemical and pharmaceutical properties of drugs. The methodologies include drug discovery strategies, molecular modeling methods, structural optimization, and therapeutic methods for drug development. This course will allow the student to integrate and implement fundamentals of chemistry in design of molecules with biological activity. Likewise, the drug discovery and development pathway will be followed through the identification of a disease, the selection of biological targets, and identification of a compound for a potential development. Instructional strategies include exploration, conceptualization and implementation (ECA) and case-based learning.

FARM 7209 - Metabolic Correction as a Functional Approach in Disease Management and Health Improvement. Three (3) credits. Pre-requisites: FARM 7206, FARM 7106, FARM 7207.
This elective course focuses on the rational, research and evidence based use of nutrients and co-factors in the management of conditions such as cardiovascular disease, diabetes, depression, dementia and cancer. It also discusses drug induced nutrient depletion and the use of botanicals, essential oils and homeopathic remedies in the management of various health conditions. Metabolic Correction (MC) is a concept based in the improvement of body cells and tissue function by means of supplying the body with substances that are needed in order to facilitate healthy biochemical reactions and physiologic processes. At the end of the course the student will be able to recommend nutrients and co-factors that have demonstrated value in the management of a variety of conditions and educate patients about their use. The course will use as instructional strategy exploration, conceptualization and application.

FARM 7217 - Integrative Seminar of Pharmaceutical Care and Human Development III. Two (2) credits. Pre-requisite: Fist Professional Year.
The Integrative Seminar III constitutes the unifying center of the curriculum. The seminar continues with the development of the abilities, which are also applied and contextualized to the knowledge and skills developed in the other courses. In this seminar, the student continues with the conceptualization of pharmaceutical care, and the implementation of the patient care process. The Seminar continues to guide the student in the preparation of the portfolio, which documents the development of the abilities throughout the academic experiences. During the first semester of the second professional year, the student will continue to develop: the knowledge of the abilities as an object of study, and the conceptualization of the practice of pharmaceutical care. The ten abilities identified as outcomes of the curriculum (pharmaceutical care, critical thinking, problem solving, self-learning, communication, ethics, social conscience and responsibility, administration, intervention in public policy, and social interaction) will be emphasized. The seminar fosters

the reflection between the educator and the student by incorporation of active learning strategies and methodologies.

FARM 7225 - Integrated Pharmaceutical Sciences and Therapeutic Agents I: Medicinal Chemistry and Pharmacology. Seven (7) credits. Pre-requisite: First Professional Year. Co-requisite: FARM 7235.
In this course of the Second Professional Year the development of the drug concept will be continued. Medicinal Chemistry and Pharmacology will be integrated to facilitate the comprehension of the relationship between the physical chemical properties and the structure with the pharmacologic action and effect in the living organism. Knowledge of the basic and Biomedical Sciences will also be integrated. Active learning methodologies will be used in addition to lecture/discussion sessions.

FARM 7226 - Integrated Pharmaceutical Sciences and Therapeutic Agents II: Medicinal Chemistry and Pharmacology. Two and a half (2.5) credits. Pre-requisites: FARM 7225.
In this course of the Second Professional Year the development of the drug concept will be continued. Medicinal Chemistry and Pharmacology will be integrated to facilitate the understanding of the relationship between the physical chemical properties and the structure of a drug with the pharmacologic action and its effects in the living organism. Knowledge of the basic and biomedical sciences will also be integrated. Active learning methodologies will be used in addition to lecture/discussion sessions.

FARM 7227 - Pharmacy and the Health Care System. Two (2) credits. Pre-requisites: FARM 7106, FARM 7116.
This course develops the conceptual model of a system as it pertains to the Health Care System in the United States and Puerto Rico, emphasizing the Pharmacy subsystem. The organizational and administrative framework that governs the provision of health care services and pharmaceutical services in the public and private sectors is presented. Models of delivery of health care services are discussed as well as financing mechanisms and payment strategies to providers. The diverse health facilities are examined, particularly those offering pharmaceutical services. The pharmaceutical services that are offered in ambulatory and institutional settings are analyzed. The role of the pharmacist as a member part of the health care team is examined. The critical analysis of current and future challenges posed by the Health Care System and the Pharmacy subsystem is encouraged and opportunities for Pharmacy are discussed. Active learning methodologies will be used.

FARM 7228 - Integrated Pharmaceutical Sciences of Anti-Infective Agents. Two and a half (2.5) credits. Pre-requisites: FARM 7225. Co-requisites: FARM 7226, FARM 7285, FARM 7229.
In this Second Year course, the students develop the conceptual framework of the medicinal chemistry, pharmacodynamics and pharmacokinetics of antimicrobial agents and its application to Pharmacy. The course emphasizes the development of conceptual knowledge of antimicrobials, as a foundation for the practice of Pharmacy. It also incorporates the problem solving process in order to enable students to prevent, identify, and solve problems related to antimicrobial therapy that are commonly encountered in the practice of Pharmacy. This course is offered in a web enhanced format, and consists of 45 classroom contact hours. The course will also provide the students with the opportunity to access online external links related to the course content, and students will also complete online activities like quizzes, exams, homework assignments, and other types of work projects that are required. Active learning strategies and methodologies are incorporated in the course.

FARM 7229 - Basic Biopharmaceutics and Pharmacokinetics. Two and a half (2.5) credits. Pre-requisites: FARM 7225.
This course covers the fundamentals of biopharmaceutics and pharmacokinetics in order to reinforce the major concept of drug for better understanding of the potential benefit related to the safety and effective use of drug product. It is aimed at enhancing the students' skills in developing and assessing formulations

based on the relationship between the drug, the dosage form and the living system. It brings together disciplines like pharmacokinetics, biopharmaceutics, physical pharmacy, compounding, and therapeutics. It strengthens some cardinal concepts related to the optimization of drug products, improve knowledge of the relationship between drug exposure and clinical outcome, with emphasis on supporting the patient-oriented pharmaceutical care goals, to refine drug dosage regimens and identify factors determining untoward responses. Active learning strategies and methodologies will be used, as well as lectures and case discussions.

FARM 7235 - Research, Education, and Scientific Method Laboratory III. One (1) credit. Pre-requisite: First Professional Year. Co-requisites: FARM 7225, FARM 7237.
In this course the development of the research, scientific method, education and professional practice concepts will continue. The education and professional practice concepts will be examined in the context of self-care and the care process when providing pharmaceutical care. In harmony with the practice, the Scientific Method will be applied by means of additional experiences in drug action/effect and compounding and manufacturing of dosage forms. Statistical concepts as a tool for research as well as for other dimensions of the Pharmacy profession will be introduced. Active learning methodologies will be used.

FARM 7237 - Compounding and Manufacturing of Dosage Forms II. Three (3) credits. Pre-requisite: FARM 7137. Co-requisite: FARM 7235.
This course continues the development of the concept dosage forms, the technological and scientific principles applied in the preparation of the dosage forms and drug delivery systems and their use in patient care. Principles of physical pharmacy, product design, compounding and manufacture with special attention to the use of these products in patient care are integrated. This course emphasizes disperse systems such as Colloids, Suspensions and Emulsions, Semisolids, Transdermal and Transmucosal Systems, Non-Traditional and other New Drug Delivery Systems, Products of Biotechnology, Aerosols and Inhalation Products and Radiopharmaceuticals. Laws and regulations applicable to research, drug product development, manufacturing and compounding practice standards and the regulatory process by which pharmaceuticals are approved for marketing are examined. Educational experiences will be developed through the use of active learning methodologies in addition to the traditional methodologies.

FARM 7245 - Clinical Skills Development for Evaluation of Inpatients. Three (3) credits. Pre-requisites: FARM 7225, FARM 7226, FARM 7228, FARM 7229.
This elective course will allow the student to apply skills in collecting, analyzing and evaluating information to develop a treatment plan in hospitalized patients. The student will integrate the skills and knowledge acquired in previous and concurrent courses such as concepts of pharmacology, pharmacokinetics, and pharmacotherapy to perform a systematic and structured assessment of drug-therapy problems. The student will use critical thinking in the analysis of scientific literature, identifying priorities for the development of appropriate pharmaceutical interventions and the development of treatment plans and documentation. Active learning methodologies are used.

FARM 7255 - Topics in Pharmaceutical Sciences II. Two (2) credits. Pre-requisite: First Professional Year. Co-requisites: FARM 7225, FARM 7235, FARM 7237.
This elective course of the Second Professional Year will enable the student, according to his conceptual level, study in more depth topics related to new developments and approaches in the Pharmaceutical Sciences. Educational experiences will be developed through the use of active learning methodologies.

FARM 7256 - Topics in Research. Two (2) credits. Pre-requisites: FARM 7135, FARM 7136. Co-requisite: FARM 7235.
This elective course of the Second Professional Year will enable the student, according to conceptual level, to study in more depth topics related to the theorical and methodological foundations of research in the Basic and Clinical Sciences, Pharmaceutical Sciences, Behavioral, Social and Administrative Pharmacy

Sciences, Pharmacy Practice or Education. Educational experiences will be developed through the use of active learning methodologies.

FARM 7257 - Health Topics Impacting Society II. Two (2) credits. Pre-requisite: First Professional Year. Co-requisite: FARM 7205.
This elective course of the second professional year will enable the student, according to his conceptual level, study in more depth current topics in the Social Sciences and Public Health impacting the society and individual and community health. The role of the pharmacist as a professional will be studied in the context of the selected topic. Educational experiences will be developed through the use of active learning methodologies.

FARM 7258 - Health Topics Impacting Society III. Three (3) credits. Pre-requisite: Completion of Second Professional Year. Co-requisite: FARM7307.
This elective course of the Third Professional Year will enable the student, according to his level, to broaden and study in more depth the conceptual framework of certain areas of content of the Social Sciences and Public Health. Objectives, concepts, and attitudes pertinent to the area of content will be studied. Educational experiences will be developed through the use of active learning methodologies.

FARM 7265 - Experience in Community Voluntary Service. Three (3) credits.
This elective course provides the student an experience in community voluntary service related to contemporary health challenges. The experience is designed to contribute to develop student's social awareness towards the pharmacist role and responsibility as a professional and citizen. Also, the course contributes to the development of abilities necessary to provide adequate service to groups or communities. The student completes a total 108 hours of community voluntary service. Active learning methodologies will be used to promote learning through discovery.

FARM 7266 - Service Learning Practicum. One (1) credit. Pre-requisite: FARM 7225, FARM 7237, FARM 7227, FARM 7205, FARM 7235, FARM 7217.
This practicum is a structured field experience, which expose the student to community health matters through the participation in public and private organizations. The student gets to know the organization mission, goals, objectives, and operation, and also the pharmacist role in community health. The knowledge obtained by the student through the academic program until this moment makes possible the provision of service to an organization contextualized in community needs and the Pharmacy profession. This practicum is an opportunity to provide community service as well as learning experience for the student.

FARM 7267 - Topics in Pharmaceutical Sciences III. Three (3) credits. Pre-requisite: Completion of Second Professional Year. Co-requisites: FARM 7331, FARM 7336.
This elective course of the Third Professional Year will enable the student, according to his level, to broaden and study in more depth the conceptual framework of certain areas of content of the Pharmaceutical Sciences. Objectives, concepts, and attitudes pertinent to the areas of content will be studied. Educational experiences will be developed through the use of active learning methodologies.

FARM 7268 - Topics in Pharmacy Administration. Three (3) credits. Pre-requisite: Completion of Second Professional Year. Co-requisite: FARM 7307.
This elective course of the Third Professional Year will enable the student, according to his conceptual level, study in more depth current topics in the Administrative Sciences as they apply to the practice of the profession of Pharmacy. The role of the pharmacist as a manager will be studied in the context of the selected topic. Educational experiences will be developed through the use of active learning methodologies, such as Case Studies, Simulations and Problem-Based Learning. Invited guests will include managers, as well as

pharmacist managers, from different practice environments such as community pharmacy, pharmaceutical industry and the institutional pharmacy.

FARM 7275 - Longitudinal Care Practice I. One (1) credit. Pre-requisites: FARM 7205, FARM 7217, FARM 7225, FARM 7227, FARM 7235, FARM 7237.
In this practice the student participates in the longitudinal care of a patient with emphasis in the continuity of care and the evaluation of the changing needs of patients. The student learns to effectively collect information from various sources, evaluate the needs of the patient, and how to prepare progress reports about the health status of the patient. In addition, the learner practices implementing the pharmacists' patient care process. The student explicitly applies the knowledge and skills developed in other courses and demonstrates the attributes of a professional. The practice includes activities that require interaction with patients, students from other health professions, as well as other health care providers.

FARM 7285 - Scientific Foundations for the Professional Practice: Microbiology. One and a half (1.5) credits. Pre-requisite: Courses of the First Semester of the First Professional Year.
This course includes the fundamentals of Biology, specifically the concepts related to Medical Microbiology, such as: Bacterial Physiology, Metabolism, Genetics, Sterilization and Disinfection, and Immunology. In addition, syndromes caused by different types of organisms are studied. Active learning strategies and methodologies will be utilized.

FARM 7305 - Health Policy and Pharmacy Law. Three (3) credits. Pre-requisites: FARM 7205, FARM 7227, FARM 7237.
The course examines Health Policy and Legislation with emphasis on their application to Pharmacy practice, the distribution and dispensing of drugs and medical devices, and the distribution of dietary supplements and cosmetics. Regulation of controlled and dangerous substances is highlighted. Risk management and the pharmacist's civil liability are addressed through case discussion and simulations. Opportunity for multifactorial critical analysis of Health Policy and Pharmacy Law is provided, and advocating for changes in order to meet societal needs is fostered. The student participates in forums at the micro and macro levels where Health Policy and Pharmacy Legislation are developed, and practices strategies for intervention in their formulation, implementation, and evaluation. Active learning strategies as instructional methodologies are used.

FARM 7306 - Psychosocial Basis, Culture, and Management Theory-Practice Seminar IV. Two and a half (2.5) credits. Pre-requisite: FARM 7205.
This Theory-Practice Seminar systematically and progressively integrates the psychosocial culture and management basis of the liberal professional curriculum during the first five semesters of the first two and a half years of the study program. In this course in particular, the concept of management is develop in the context of Pharmacy in the health system. Leadership, motivation, supervision, resources management and strategic planning will be studied. Active learning strategies and teaching methodologies will be used.

FARM 7307 - Psychosocial Basis, Culture, and Management Theory-Practice Seminar V. Four (4) credits. Pre-requisites: Classified in Third Year of Pharm D, FARM 7306.
This Theory-Practice Seminar systematically and progressively integrates the psychosocial, culture and management basis of the liberal professional curriculum during the first five semesters of the first two and a half years of the program of studies. In this course in particular, the psychosocial component continues to be examined through ethics applied to professional practice. The concept of Pharmacy management continues to be studied in health care systems. Physical and fiscal resources, marketing of products and services, organization, direction and coordination, and pharmacoeconomics will be studied, and a business plan will be formulated. Active learning strategies and teaching methodologies will be used, including the use of line platform.

FARM 7308 - Principles for the Professional Practice of Clinical Geriatric Pharmacy. Two (2) credits. Pre-requisites: Approved the courses of the Second Professional Year of the Doctor of Pharmacy Program.
This elective course develops and integrates important aspects of pharmaceutical care provided to older adults (>65 years) in the geriatric field. It emphasizes geriatric syndromes and particular problems in the geriatric population that may include the following clinical manifestations: psychiatric, neurologic, renal, urologic, respiratory, dermatologic, endocrine, gastrointestinal, hematologic, infectious and muscle-skeletal. This course promotes active and participative learning. Teaching strategies include: Exploration, Conceptualization and Application (ECA), Problem Based Learning (PBL), and Problem Posing.

FARM 7309 - Self-Management of Conditions with OTC Drugs and Devices. Three (3) credits. Pre-requisites: Approved the courses of the Second Professional Year.
This elective course will allow the student to expand their knowledge about the self-management of health conditions with over the counter (OTC) medications and medical devices. Natural products, vitamins, minerals, among others will also be discussed. The conditions that will be discussed include: cold, diarrhea, constipation, fever, and pain, among others. The student will evaluate patient characteristics (ie. Special populations) and OTC medications to select the safest and most effective alternative. Relevant aspects about the medications to be studied include: interactions, adverse effects, and patient education, among others. The student will be able to distinguish when it may be necessary to refer the patient for a medical evaluation. Teaching methodologies that promote active learning will be utilized.

FARM 7315 - Integrative Seminar on Pharmaceutical Care and Human Development IV. One (1) credit. Pre-requisite: FARM 7217.
The Integrative Seminar IV constitutes the unifying center of the curriculum. In the Seminar, the student continues with the conceptualization and application of the general abilities, and with the integration of knowledge and skills developed in other courses. Emphasis will be placed on the unification of scientific and creative knowledge and the implementation of the patient care process. This integration provides the student the opportunity to integrate the knowledge developed in other curricular blocks, in order to establish their relevance to the practice of pharmaceutical care. In addition, the concepts of interprofessional education continue to be practiced. The seminar also continues to guide the student in the preparation of the portfolio, which documents the development of the abilities throughout the academic experience. An emphasis is placed on the development of the abilities of pharmaceutical care, problem solving and decision making, critical thinking, self-learning and professional development, and communication. The seminar fosters the reflection between the student and the educator by incorporating active learning strategies and methodologies.

FARM 7317 - Integrative Seminar of Pharmaceutical Care and Human Development V. Two (2) credits. Pre-requisites: FARM 7315.
The Integrative Seminar constitutes the unifying center of the curriculum. In this seminar, the student continues with the conceptualization and application of the general abilities, and with the integration of knowledge and skills developed in other courses. It also continues with the conceptualization of pharmaceutical care, and with the implementation of the patient care process. This seminar also guides the student in the preparation of the portfolio, which documents the development of the abilities throughout the academic experience. The student will continue with the conceptualization of: the abilities as an object of study and the pharmaceutical care practice. An emphasis is placed on the development of the abilities of pharmaceutical care, problem solving, and decision making, critical thinking, administration, social conscience and responsibility, intervention in public policy, social interaction and relations, and ethics. The seminar incorporates active learning strategies and methodologies.

FARM 7318 - Integrative Seminar on Pharmaceutical Care and Human Development VI. One (1) credit. Pre-requisite: FARM 7317.
The Integrative Seminar constitutes the unifying center of the curriculum. In the seminar, the student continues to develop the conceptualization, application of the general abilities and the integration of knowledge and skills developed in other courses. The integration provides the student the opportunity to integrate the knowledge developed in other courses, in order to establish their relevance to the practice of pharmaceutical care and the patient care process. The seminar guides the student in the construction of the assessment portfolio, which documents the development of the abilities throughout the academic experience. An emphasis is placed on the development of the abilities of pharmaceutical care, problem solving and decision making, critical thinking, self-learning and professional development, communication, administration, and ethics. The seminar fosters the reflection between the student and the educator by incorporating active learning strategies and methodologies.

FARM 7331 - Integrated Sciences, Therapeutics, and Patient Care I. Seven (7) credits. Pre-requisites: FARM 7225, FARM 7226, FARM 7228, FARM 7229.
This course, of the Third Professional Year, integrates aspects of the disciplines of Pathophysiology, Pharmacokinetics, Pharmacodynamics, Toxicology, Pharmacoepidemiology, Pharmacoeconomics, and Pharmacotherapy related to patient care. Students participate in educational activities that enable them to design, implement, and evaluate pharmaceutical care plans for patients with specific illnesses. Emphasis is given to specific goals of therapy, evaluation of the achievement of these goals and the phases of active intervention at different levels in order to achieve satisfactory results. This course studies the diseases commonly encountered by pharmacists in a variety of practice scenarios, including ambulatory as well as institutional, in Puerto Rico. The course will utilize lectures and discussions beside active learning strategies and methodologies.

FARM 7332 - Integrated Sciences, Therapeutics, and Patient Care II. Seven (7) credits. Pre-requisite: FARM 7331.
This course, of the Third Professional Year, integrates aspects of the disciplines of Pathophysiology, Pharmacokinetics, Pharmacodynamics, Toxicology, Pharmacoepidemiology, Pharmacoeconomics, and Pharmacotherapy related to patient care. Students will be able to design, implement and evaluate pharmaceutical care plans for patients with specific illnesses of the Respiratory, Endocrine and Neurological Systems, among others; commonly encountered by pharmacists in a variety of practice scenarios, including ambulatory as well as institutional, in Puerto Rico. Emphasis is given to specific goals of therapy, evaluation of the achievement of these goals and the phases of active intervention at different levels in order to achieve satisfactory results. The course will utilize lectures and discussions beside active learning strategies and methodologies.

FARM 7335 - Research, Education, and Scientific Method Laboratory IV. One (1) credit. Pre-requisite: FARM 7235.
In this course the development of the research, Scientific Method, education, and professional practice concepts will continue. The education and professional practice concepts will be examined in the context of providing pharmaceutical care for self-care through responsible self-medication and in experiences that will contribute to the development of the concept of management. In harmony with the practice, the Scientific Method will be applied by means of experiences in drug action/effect of antimicrobial agents, biotechnology and pharmacy, and compounding of extemporaneous dosage forms. Statistical concepts will continue to be developed as a tool for research as well as for other dimensions of the Pharmacy profession. Active learning methodologies will be used.

FARM 7336 - Research, Education, and Scientific Method Laboratory V. One (1) credit. Pre-requisite: Completion of Second Professional Year. Co-requisites: FARM 7317, FARM 7331.
In this course the development and application of the education, professional practice, Scientific Method, and research concepts will continue. The education and professional practice concepts will be developed in the context of literature evaluation and dermatologic conditions. The research and Scientific Method concepts will be developed through literature evaluation and research proposal writing. Active learning methodologies will be used.

FARM 7337 - Research, Education, and Scientific Method Laboratory VI. One (1) credit. Pre-requisite: FARM 7336. Co-requisites: FARM 7318, FARM 7332.
In this course the concepts of education, professional practice, Scientific Method, and research will continue to be developed. In addition, learning activities will address the concepts of pharmaceutical care, health, disease, drug, psychosocial principles and service. These major concepts are integrated and applied principally in the context of case studies that represent common health problems and the proposal for the research project of the Pharm D program. Active learning methodologies will be used.

FARM 7339 - Research Project. Two (2) credits. Pre-requisites: FARM 4055, FARM 5005.
In this course the student(s) will select a topic of interest in order to develop a research project. The student(s) will design and submit a research proposal to the research project committee for approval. The research project will be supervised by a faculty member of the School of Pharmacy. The faculty member will meet and discuss individually or in group written paper work. The student(s) will perform an oral and written presentation of the research project.

FARM 7345 - Management of the Practice and the Medication Distribution and Control Systems Practicum: Institutional Pharmacy. Four (4) credits. Pre-requisite: FARM 7331, FARM 7307, FARM 7336, FARM 7317, FARM 7375.
This practicum is designed to provide a comprehensive experience on the structures and basic processes needed to support the drug distribution and control systems in the practice of Institutional Pharmacy and its integral relation with the medication use process and the delivery of pharmaceutical care. The student will complete 144 hours of practice in an Institutional Pharmacy. The principal instructional methodology is Practice-Based Teaching.

FARM 7346 - Management of the Practice and the Medication Distribution and Control Systems Practicum: Community Pharmacy. Four (4) credits. Pre-requisite: FARM 7331, FARM 7307, FARM 7336, FARM 7375, FARM 7317.
This practicum is designed to provide a comprehensive experience on the structures and basic processes needed to support the drug distribution and control systems in the practice of Community Pharmacy and its integral relation with the medication use process and the delivery of pharmaceutical care. The student will complete 144 hours of practice in a Community Pharmacy. The principal instructional methodology is Practice-Based Teaching.

FARM 7375 - Longitudinal Care Practice II. One (1) credit. Pre-requisite: FARM 7275.
In this practicum, continuation of Longitudinal Care I, the student participates in the longitudinal care of a patient with emphasis in the continuity of care and the evaluation of the changing needs of the patients. The student collects information from various sources, identifies drug therapy problems, develops and implements care plans and provides follow-up, thus applying the pharmacists' patient care process. The practicum includes activities that require interaction with patients, students from other health professions, as well as other health care providers.

FARM 7420 - Seminar on Professional and Human Development I. One (1) credit. Pre-requisites: Completion of Third Professional Year of Program of Studies.
This course will provide a framework which will enable the student to become actively involved in current issues in Pharmacy. Each student is expected to contribute to the discussion and formulate solutions to the issues presented based on information gathered by them, evaluation on the literature available as well as interacting with others professionals, among others. The seminar is designed to provide the student with opportunities to develop the professional abilities in the context of the issues under discussion and major learning that has occurred in other courses. It also guides the student in the preparation of their portfolio where they will present products as evidence of the development of the abilities. Active learning instructional methodologies will be used. Students from the Baccalaureate Program in transition to the Doctor of Pharmacy Program must take this seminar in both semesters during the last professional year.

FARM 7421 - Seminar on Professional and Human Development II. One (1) credit. Pre-requisite: FARM 7420.
This course, a continuation of FARM 7420, builds on a framework developed to enable the student to become actively involved in current issues in Pharmacy. Each student is expected to contribute to the discussion and formulate solutions to the issues presented based on information gathered by them, evaluation of the literature available as well as interacting with other professionals, among others. The seminar is designed to provide the student with opportunities to develop the professional abilities in the context of the issues under discussion and major learning that has occurred in other courses. It also guides the student in the preparation of their portfolio where they will present products as evidence of the development of the abilities. Active learning instructional methodologies will be used.

FARM 7425 - Forensic Pharmacy. Three (3) credits. Pre-requisites: FARM 7225, FARM 7325. Pre-requisites: Pre-requisites: FARM 7225, FARM 7226, FARM 7228, FARM 7229.
In this course the students study the causes of death due to interactions of therapeutic, prohibited, and illegal drugs. Other topics presented are Medication Errors, Drug Related Crimes, Poisonings, Legal and Expert Witness Issues. The student will work on a research project of his or her selection. Active and participatory learning are employed to develop concepts, attitudes, and values. The learning methodologies of active learning such as questioning, Socratic dialogue, and cooperative learning, among others are used. On completion of the course the student will possess a comprehensive knowledge of the relation that exists between the Forensic Sciences and the practice of Pharmacy.

FARM 7438 - Doctor of Pharmacy Research Project. One (1) credit. Pre-requisites: FARM 7337, Approval of the PharmD. Research Proposal.
In this course the student(s) of Doctor of Pharmacy Program will conduct a research project, experience in which concepts and abilities will be integrated. The student will select a topic of interest in the context of Clinical Science, Pharmaceutics, Biomedical, Behavior, Social, Administrative and Pharmaceutical Education in order to write a research project within the framework of pharmaceutical care. Students will conduct a research project individually or up to a maximum of three students under the supervision of the same faculty member (advisor). The advisor will meet periodically with the students during all project phases, including the oral presentation and written paper work. Grading System: Passed (P), Not Passed (NP)

FARM 7451 - Selective Advanced Practice in Pharmacy. Four to five (4-5) credits. Pre-requisites: Students are required to be classified in 4th professional year.
These practice experiences are designed to provide comprehensive in-depth experience to students in a wide range of practice areas in pharmacy. It can include participation in traditional practice settings and participation in innovative pharmacy practice settings. Selective advanced pharmacy practice experiences in non-traditional settings (such as research, academia, manufacturing, management, drug information, managed care, long-term care, hospice, and home health care) should serve as a complement to the required

practice experiences and provide adequate opportunities for students to mature professionally and in accordance with their individual interests. The main instructional methodology for these experiences is practice based learning. Grading System: Passed (P), Not Passed (NP)

FARM 7452 - Selective Advanced Practice in Pharmacy. Four to five (4-5) credits. Pre-requisites: Students are required to be classified in 4th professional year.
These practice experiences are designed to provide comprehensive in-depth experience to students in a wide range of practice areas in pharmacy. It can include participation in traditional practice settings and participation in innovative pharmacy practice settings. Selective advanced pharmacy practice experiences in non-traditional settings (such as research, academia, manufacturing, management, drug information, managed care, long-term care, hospice, and home health care) should serve as a complement to the required practice experiences and provide adequate opportunities for students to mature professionally and in accordance with their individual interests. The main instructional methodology for these experiences is practice based learning. Grading System: Passed (P), Not Passed (NP).

FARM 7453 - Selective Advanced Practice in Pharmacy. Four to five (4-5) credits. Pre-requisites: Students are required to be classified in 4th professional year.
These practice experiences are designed to provide comprehensive in-depth experience to students in a wide range of practice areas in pharmacy. It can include participation in traditional practice settings and participation in innovative pharmacy practice settings. Selective advanced pharmacy practice experiences in non-traditional settings (such as research, academia, manufacturing, management, drug information, managed care, long-term care, hospice, and home health care) should serve as a complement to the required practice experiences and provide adequate opportunities for students to mature professionally and in accordance with their individual interests. The main instructional methodology for these experiences is practice based learning. Grading System: Passed (P), Not Passed (NP).

FARM 7454 - Selective Advanced Practice in Pharmacy. Four to five (4-5) credits. Pre-requisites: Students are required to be classified in 4th professional year.
These practice experiences are designed to provide comprehensive in-depth experience to students in a wide range of practice areas in pharmacy. It can include participation in traditional practice settings and participation in innovative pharmacy practice settings. Selective advanced pharmacy practice experiences in non-traditional settings (such as research, academia, manufacturing, management, drug information, managed care, long-term care, hospice, and home health care) should serve as a complement to the required practice experiences and provide adequate opportunities for students to mature professionally and in accordance with their individual interests. The main instructional methodology for these experiences is practice based learning. Grading System: Passed (P), Not Passed (NP).

FARM 7487 - Institutional Pharmacy Practice. Five (5) credits. Pre-requisite: Students are required to be classified in 4th Professional Year.
This practice provides opportunities for comprehensive, in-depth experience in administration and medication use process improvement within institutional pharmacy practice. Its emphasis is the pharmacist's responsibility in the administrative aspects of the prevention, detection, and solution of pharmacotherapeutic problems found in health care institutions. The student participates in activities related to the management of the pharmacy department and optimization of the medication use process such as medication formulary management, medication use evaluations, and adverse drug events/medication error programs. The main instructional methodology is practice based learning. Grading system: Passed (P), Not Passed (NP) since August 2013.

FARM 7488 - Inpatient Pharmaceutical Care: General Medicine Practice. Five (5) credits. Pre-requisite: Students are required to be classified in 4th Professional Year.
This practice provides the student with comprehensive in-depth experience in the provision of pharmaceutical care in the acute patient setting in collaboration with other health care professionals. Its emphasis is the pharmacist's responsibility in the prevention, detection and solution of pharmacotherapeutic problems found in general medicine patients, through a systematic pharmacist delivered patient care process. The student will gather pertinent information, evaluate pharmacotherapeutic problems, develop and document care plans including specific results achieved in the patient. The main instructional methodology is practice-based learning. Grading system: Passed (P), Not Passed (NP) since August 2013.

FARM 7489 - Inpatient Pharmaceutical Care: Acute Care in Specialized Practice. Five (5) credits. Pre-requisite: Students are required to be classified in 4th Professional Year.
This practice provides the student with comprehensive in-depth experience in the provision of pharmaceutical care in collaboration with other health care professionals in a specialized setting such as critical care, oncology, pediatrics, and trauma, among others. Its emphasis is the pharmacist's responsibility in the prevention, detection and solution of pharmacotherapeutic problems found in an acute care practice, through a systematic pharmacist delivered patient care process. The student will gather pertinent information, evaluate pharmacotherapeutic problems, develop and document care plans including specific results achieved in the patient. The main instructional methodology is practice-based learning. Grading system: Passed (P), Not Passed (NP) since August 2013.

FARM 7497 - Pharmaceutical Care in the Ambulatory Setting: Community Pharmacy Practice. Five (5) credits. Pre-requisite: Students are required to be classified in 4th Professional Year.
This practice provide students with comprehensive in-depth experience in the provision of pharmaceutical care in the community pharmacy. Its emphasis is the pharmacist's responsibility in the prevention, detection and solution of pharmacotherapeutic problems through a systematic pharmacist delivered patient care process. Students will be integrated to the following pharmacist responsibilities: prescription processing, counseling, compounding, direct patient care services such as medication therapy management, chronic diseases education and immunizations, and providing drug information and recommendations to other health care professionals. The main instructional methodology is practice based learning. Grading system: Passed (P), Not Passed (NP) since August 2013.

FARM 7498 - Pharmaceutical Care in Ambulatory Setting: Institutional Practice. Five (5) credits. Pre-requisite: Students are required to be classified in 4th Professional Year.
This practice provides the student with comprehensive in-depth experience in the provision of pharmaceutical care in the ambulatory setting of a health institution. Its emphasis is the pharmacist's responsibility in the prevention, detection and solution of pharmacotherapy problems found in this setting, through a systematic pharmacist delivered patient care process. The student will gather pertinent information, evaluate pharmacotherapeutic problems, develop and document care plans including specific results achieved in the patient. The experience requires active participation in a progressive manner and is designed to develop skills, judgment, professional behavior, attitudes and values, confidence, and personal responsibility needed for each student to perform independently in a collaborative practice. The main instructional methodology is practice based learning. Grading system: Passed (P), Not Passed (NP) since August 2013.

FARM 7505 - Toxicology: Principles and Specific Health Hazards. Three (3) credits. Pre-requisite: FARM 7225.
In this course, the concept of drug will be expanded to include the study of toxic agents that are not drugs. Students will become familiarized with basic and applied principles, concepts, and practices of Toxicology. They will use this information to characterize and discuss how toxic responses resulting from exposure to

specific health hazards (selected in consultation with the professor) are identified, controlled and/or prevented. Students will demonstrate mastery of their topic by organizing and presenting information in verbal and written reports. Teaching methodologies will include discussions, conferences, Socratic dialog and independent study. Internet access and literacy is required.

FARM 7515 - Drug Information. Three (3) credits.
The purpose of this elective course is to strengthen the principles of Drug Information and Drug Literature Evaluation through discussion, using a non-traditional web based modality. Emphasis is placed in understanding important concepts that will provide the health care practitioner with knowledge, skills and attitudes needed to retrieve and evaluate the medical literature. Students will manage multiple forms of drug literature including primary, secondary, tertiary, computerized databases and internet resources. The areas of Evidence-Based Medicine and Poison Information will also be covered.

FARM 7520 - Diabetes Education Principles. Three (3) credits. Pre-requisites: Satisfactorily complete the courses of the Second Professional Year of the Doctor of Pharmacy Program.
This elective course includes a sequence of educational sessions that enhance the development of skills and concepts related to the education and care of the patient with Diabetes. The course encourage Pharmacy students to develop educational literature that could be used at their practice centers to educate patients with Diabetes, apply the knowledge acquired, and develop new concepts. During the course, several tasks or special projects will be assigned to the students, according to the needs and student priorities. The student will coordinate a group educational activity directed to patients with Diabetes in a selected community. Active learning methodologies will be used, as well as, the Blackboard Learning System will be adopted as a learning and educational tool to enhance the distance interaction between student-professor and student-student.

FARM 7605 - Introduction to Medication Therapy Management Services. Three (3) credits. Pre-requisites: FARM 7225, FARM 7237, FARM 7227, FARM 7235, FARM 7217, FARM 7205, FARM 7266, FARM 7285, FARM 7305, FARM 7306, FARM 7315, FARM 7226, FARM 7228, FARM 7229, FARM 7335, FARM 7275.
In this elective course students will have the opportunity to learn, expand and deepen concepts and skills related to the practice of Medication Therapy Management. Topics such as professional practice and patient care management issues by providing pharmaceutical care, strategic planning, drug-related problems, communication and interview techniques, among others, will be examined. The course will also allow the student exposure to different aspects that involve the creation, offering and service evaluation of Medication Therapy Management (MTMS, for its acronym in English, such as business plan, rebates, profits and benefits, documentation of interventions, among others. The course will use teaching strategies such as Exploration, Conceptualization and Application (ECA) and Problem Based Learning (PBL), as well as teaching methodologies for active learning.

INTD 7995 - Complementary Practices for Health and Healing. Three to five (3-5) credits.
The course gives an overview of various health belief systems in Complementary and Alternative Medicine (CAM) and examines the current trends in the utilization of some of these practices and its implications. Specific therapeutic practices will be discussed. Information resources of natural products will also be reviewed. The paradigms in which biomedical model is based, its strengths and limitations will be discussed, as well as comparison with other healing philosophies and practices. Most common forms of healing practices, its theories, proposed mechanism of action, specific indication, expected results, available scientific evidence, contraindications, adverse effects, and interactions or interference between conventional and non-conventional practices will be study. This course will be offered at the Undergraduate, Graduate, and First Professional Level. For Medical School students the number of hours will fluctuate between 80-160 hours. The instructional strategies will include lecture, discussion, practical experience, case study, and workshop.

GRADUATE PROGRAM

Doctor of Pharmaceutical Sciences (Ph.D.)

PHSC 8016- Advanced Biopharmaceutics and Pharmacokinetics. Three (3) credits.
This course expands the basis of the Biopharmaceutics and Pharmacokinetic principles and procedures in order to reinforce and enhance the knowledge on critical concepts such as drug product, bioavailability, dosing regimens, ADME and their applications in clinical settings. The students will acquire relevant information for better understanding of the potential benefit related to the safety and effective use of drug product. It is aimed at enhancing the students' skills in developing and assessing formulations based on the relationship between the drug, drug delivery system, dosing regimen and the living system. It brings together disciplines like pharmacokinetics, biopharmaceutics, physical pharmacy, compounding, and therapeutics. It strengthens concepts related to the optimization of drug products by identifying factors determining untoward responses and poor bioavailability. Active learning strategies and methodologies will be used, as well as lectures and case discussions.

PHSC 8116-Advanced Instrumental Analysis. Three (3) credits.
In this problem-based course the practical and theoretical principles of analytical techniques utilized in the qualitative and quantitative analysis of drugs, metabolites, excipients, and endogenous substances in biological fluids and other matrixes will be discussed. The student will acquire the knowledge of the different techniques that will be used to analyze compounds in complex matrices; for example, drug development, biological fluids, tissue, environmental samples, and others. The student will be exposed to various situations in which he/she can used their own judgment to select the most appropriate technique to be used according to the situation. In addition, the principles and concepts of analytical method validation for the instrumental techniques will be discussed.

PHSC 8122- Advanced Medicinal Chemistry and Pharmacognosy I. Three (3) credits.
In this course the disciplines of medicinal chemistry and pharmacognosy are integrated to facilitate understanding of the relationship between the physical and chemical properties of a drug and pharmacological effect, action in the living organism, the isolation and structural determination of compounds with pharmaceutical, medicinal and biological activities derived from plants. In addition, knowledge of basic and biomedical sciences is integrated. It will be incorporated to the lecture/discussion, active learning methodologies.

PHSC 8123- Advanced Medicinal Chemistry and Pharmacognosy II. Three (3) credits.
In this course of the second graduate year will continue with the development and study of drug concept from synthetic drugs or medicinal plants. Disciplines of medicinal chemistry and Pharmacognosy are integrated to facilitate understanding of the relationship between the physical and chemical properties of a drug and pharmacological effect, action in the living organism, the isolation and structural determination of compounds with pharmaceutical, medicinal and biological activities derived from plants. In addition, knowledge of basic and biomedical sciences is integrated. It will be incorporated to the lecture/discussion, active learning methodologies.

PHSC 8127- Advanced Molecular Biochemistry. Three (3) credits.
This course focuses on the structure and function of biomolecules, including proteins, enzymes, nucleic acids, lipids, carbohydrates, vitamins, and hormones. It also deals with the transformations, interactions and energy changes of these biomolecules (metabolism) in the different cells of the organism and how these reactions are regulated. The origin of high-energy compounds is described in relation to mitochondrial function and their participation in energy requiring processes. In addition, the course will present the characteristics of the human genome, the replication and repair of the genetic material, the transcription and translation of

genetic information, the alteration of genetic material (mutations), and its consequences (genetic diseases), and the modern methods and techniques of molecular biology (such as: recombinant DNA technology, gene therapy and cloning).

PHSC 8131- Advanced Pharmacology I. Four (4) credits.
In this course, the students will be exposed to the advanced principles of pharmacology and the modern aspects of pharmacokinetics, pharmacodynamics and pharmacogenomics. In addition, students will be exposed to different drug classes, discussion will be divided by organ system and clinical conditions. Specifically, discussion will focus on the mechanism of action, therapeutic applications and adverse reactions; including toxicity and the appropriate treatments and major drug-drug interactions. Emphasis will be given to the principles of absorption, distribution, metabolism and excretion (ADME). Knowledge of the basic and biomedical sciences will also be integrated. Active learning methodologies will be used in addition to lecture/discussion sessions. This course will be delivered in face-to-face mode.

PHSC 8132- Advanced Pharmacology II. Two (2) credits.
In this course the principles of advanced pharmacology and modern aspects related to the effects of drugs on humans and other living organisms are discussed. In addition, its main use by organ systems including the nervous, cardiovascular, endocrine systems, and by clinical conditions or disease states including cancer, inflammatory and infectious diseases is also discussed. Drug mechanisms, major toxicities and interactions, botanical preparations, and treatment strategies for major diseases, are discussed. The principles of absorption, distribution, metabolism and excretion (ADME), clinical applications and advanced pharmacology concepts on the development of modern drugs such as gene therapy, will be emphasized. The course includes lectures, active learning methodologies, and discussions of scientific articles. This course will be delivered in face-to-face mode

PHSC 8236- Applied Biostatistics. Three (3) credits.
Basic concepts in Statistics are discussed including descriptive statistics, graphs, probability and inferential statistics. Several statistical methods for univariate and bivariate analysis are discussed in the context of pharmaceutical sciences and health.

PHSC 8237- Advanced Methods and Synthetic Organic Chemistry. Three (3) credits.
This advanced course in organic synthetic methods is designed for students in their second year of Ph.D. in Pharmaceutical Sciences. The main goal of this course is to provide students with a stimulating learning experience and modern studies on aspects of organic chemistry. This course will provide students with an advanced knowledge in theory, concepts and methodologies related to organic synthesis, and a methodical construction of organic molecules. The course will cover topics from stereochemical and conformational analysis, formation of carbon-carbon bonds, oxidation and reduction of functional groups, organometallic reactions, and total synthesis of complex molecules. After completing this course, students should be prepared to implement these concepts in medicinal chemistry and natural products research with high relevance in the design and synthesis of organic molecules whose properties and characteristics are of interest in medicinal applications.

PHSC 8335- Ethics in Research. Two (2) credits.
Through lectures and group discussions this course presents and analyzes specific issues related to scientific integrity such as authorship and publication, scientific record keeping, data ownership and management, peer review and mentorship. Behaviors related to Research Misconduct will be analyzed in depth. This course also presents and analyzes specific issues related to intellectual property and the protection of human participants in scientific research. The course is intended to instruct students about **ethical issues in research** in order to accomplish ethical behavior throughout their career.

PHSC 8338- Business, Quality and Project Management. Three (3) credits.
The purpose of the course is to lay the foundation and principles for a solid understanding of business, quality and project management and introduces the concept of entrepreneurship to life in their profession. The course covers key competencies for planning and controlling projects, leading quality improvement initiatives and understanding interpersonal relationships that drive successful project outcomes. Focusing on the introduction of new products and processes, the course discusses the project management life cycle, defining project parameters, matrix management challenges, effective project management tools and techniques, and the role of a project manager. The principles of Lean Manufacturing will be an integral portion of the course. Students will develop knowledge and skills necessary to manage their teams, schedules, risks, and resources to produce a desired outcome.

PHSC 8425- Laboratory Rotation. One (1) credit.
In this laboratory experience the student will rotate through three different research facilities and will work on projects under the supervision of a faculty member. This hands-on experience will expose the student to different research topics within the pharmaceutical sciences area. In addition, the student will acquire introductory training in diverse laboratory techniques and will apply the concepts of experimental design in a real scenario. It is expected that at the end of this course the student will be able to choose a thesis project topic and a major advisor.

PHSC 8427- Pharmaceutical Engineering and Unit Operations- Three (3) credits.
Presents unit operations and engineering principles involved in the manufacture of pharmaceuticals, from the isolation and purification of active pharmaceutical ingredients (API) to the final production of drug products. Regulatory issues include quality by design (QbD) and process analytical technologies (PAT) of unit operations, such as distillation, extraction, crystallization, filtration, drying, milling, blending, granulation, and tableting.

PHSC 8436- Pharmaceutical Formulation and Drug Delivery. Three (3) credits.
This course focuses on the pharmaceutical formulation development (drug product) covering the theoretical aspects of different types of dosage forms and their delivery mechanisms. The course will follow a Quality by Design (QbD) approach to formulation development, highlighting key stages as (I) drug and excipient selection (preformulation design), (II) biopharmaceutical considerations and (III) physico-chemical considerations, and (IV) manufacturing considerations. For each stage Important concepts and methods and their underlying theory is discussed. In addition, the course will include novel formulations and delivery systems.

PHSC 8437- Pharmacogenomics/Pharmacogenetics. Three (3) credits.
This course is aimed at covering the fundamentals of Pharmacogenomics in order to enhance the safety and benefits of a therapeutic intervention, as part of the personalized healthcare paradigm. Students will acquire relevant information for better understanding of the potential benefit and/or risk of a drug product in a particular population. This course pursues to bring together interplaying disciplines such as genetics, pharmacokinetics and therapeutics. The course will discuss concepts regarding pharmacogenomics, genetic polymorphism, population and individual variability and metabolic interactions. Both instructive and didactic lectures, case-study discussions, following participatory strategies of learning and informatic technology logistics, will be used. This course involves the therapeutic implications of population genetic differences in order to explain why some people respond well to a drug whereas others do not receive the expected benefit or develop undue adverse events.

PHSC 8447- Principles of Drug Discovery and Drug Development. Three (3) credits.
This course is designed to provide the student with an in depth understanding of how academic institutions, pharmaceutical and biotechnology companies discover, develop and characterize new drug candidates for

clinical trials. The course will focus on the development of small molecule and biological drugs and will follow the discovery path through identification of a disease, selection of biological targets and identification of a potential candidate to the preclinical characterization of the drug necessary for the development.

PHSC 8501-Pharmaceutical Nanotechnology. Three (3) credits.
This course focuses on the fundamentals of nanotechnology in pharmaceutical research covering the understanding of nanomaterials for diverse medical applications. The course will follow (I) preparation and characterization methods of various types of nanostructures, (II) concepts and mechanisms of drug targeting, (III) pharmaceutical and biomedical applications of nanosystems for drug delivery and theragnostic applications, (IV) interaction of nanoparticles with biological systems and toxicity aspects of nanomaterials and (VI) interpretation of the knowledge gained into practical approach. This course will also guide the students to understand how nanostructures can be designed to serve diverse pharmaceutical and biomedical rationales. This course will be offered Face to face.

PHSC 8500- Entrepreneurship and Business Development in the Biopharmaceutical Industry Sector. Three (3) credits.
The objective of the course is to follow through the course PHSC 8338 business, quality, and project management learnings, taking these to the next level, the creation of an enterprise, a research collaboration, and talent development. The course takes the student's learnings gain through the pharmaceutical sciences program, and their research into business opportunities that create growth either through the creation of new products or services or creating business growth for an established company. The students and their sponsoring principal investigators (PI) will be guided toward the development of a business idea into a formal innovation business model, or a collaboration project leading to knowledge building or knowledge transfer through an established company business case. This course will be offered face to face.

PHSC 8516- Principles of Pharmaceutical Sciences. Three (3) credits.
This course introduces the fundamental principles of physical and chemical pharmacy and its applications in pharmaceutical formulation, design and development of dosage forms and drug delivery systems. The course also deals with the interaction with biological and physicochemical combinations related to drug effectiveness (dissolution and bioavailability) and dosage form design. This course will be offered face to face.

PHSC 8517- Regulatory and Manufacturing Practices. Three (3) credits.
This course required by the PhD program will provide to the student the fundamentals behind the regulatory guidelines and regulations related to the quality of a pharmaceutical drug throughout it's life cycle. Starting from the development of the drug, submission and clinical trials, manufacturing process development, commercial manufacture, up to it's discontinuation. The student will learn through interactive lectures and class discussions the regulations and guidelines developed and/or embraced by the Food and Drug Administration, such as Code of Federal regulations (CFRs), FDA Frameworks and Guidelines, and the International Conference on Harmonization (ICH), and the European Medicines Agency (EMA) regulations.

PHSC 8600- Principles in Research Design-Two (2) credits.
In this course the students will be exposed to the skills necessary for writing a successful research proposal including basic concepts, statement of problem, hypothesis, objectives, design of experiments, experiment planning, analysis of the data and documentation of results. At the end of the course the students will be required to submit an original completed research proposal.

PHSC 8601-Research. Three (3) credits.
Research is an ongoing process in which one is expected to stay on top of the relevant developments in the discipline. The principal objective of this course is to provide the student knowledge and skills in a variety of areas to strengthen personal, academic, and research competencies to succeed in the graduate program. Its

investigational work developed by the student towards its dissertation. This is an independent study course for a student to develop and implement a research project with a faculty mentor.

PHSC 8602-Seminar. One (1) credit.
Research is an ongoing process in which one is expected to stay on top of the relevant developments in the discipline. The principal objective of this course is to provide the student knowledge and skills in a variety of areas to strengthen personal, academic, and research competencies to succeed in the graduate program. The seminar introduces the student, through conferences, oral presentations, seminars, colloquiums, and forums, to a process of academic research and allows to have an open mind to problem-solving strategies based on formal inquiry and detailed research. Students are expected to engage in active questioning and discussion as part of the presentations.

PHSC 8605-Thesis. Three (3) credits.
The degree of Doctor of Philosophy (PhD) in Pharmaceutical Sciences represents the student's demonstration of mastery, independent and comprehensive scholarship in this field. In this course, the PhD candidate will complete and present their thesis dissertation before the Major Advisor and the thesis committee. This activity will constitute an integration of all the knowledge, skills and competencies acquired by the student as well as practical research experiences. They will receive authorization of the thesis committee to present the main findings of the thesis project in a public oral defense and examined by duly constituted thesis committee. In this course, the student will finish the thesis project and will provide reports and the final version of the thesis document. The thesis committee will meet with students periodically to review progress, make recommendations, rehearse the oral presentation and finalize the necessary documentation. The course will be offered face to face.

Master of Science in Pharmacy

FABI 6311 - Advanced Biological Chemistry I. Two (2) credits.
This course deals with the structure and function of biomolecules, including proteins, enzymes, nucleic acids, lipids, carbohydrates, vitamins and hormones. It also deals with the transformations, interactions and energy changes of these biomolecules (metabolism) in the different cells of the organism and how these reactions are regulated under ever changing environmental conditions and during cell differentiation (genetic and epigenetic regulation). The origin of "high energy" biomolecules are described mainly in relation to mitochondrial function and their participation in energy requiring processes. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FABI 6312 - Advanced Biological Chemistry II. Two (2) credits. Pre-requisite: FABI 6311.
This course deals with the characteristics of the human genome, the replication and repair of the genetic material, the transcription and translation of genetic information, the alteration of genetic material (mutations), and its consequences (genetic diseases), and the modern methods and techniques of molecular biology (recombinant DNA technology, gene therapy and cloning) the general mechanisms of hormone action and the molecular bases of nutrition are dealt with in this course. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6311 - Advanced Physical Pharmacy I. Two (2) credits.
This course helps the students to understand the quantitative relationships between heat and other forms of energy. Also, it provides the students with the theories and principles involved in the three laws of thermodynamic. In addition, it will provide the students with the theories, concepts and fundamental principles of solutions. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6312 - Advanced Physical Pharmacy II. Two (2) credits. Pre-requisites: FAFI 6311.
This course is essential for helping the students in understanding the physical chemical foundations of the pharmaceutical sciences and their pharmaceutical applications and also update the students with the progress and new researches in the topics outlined in this course such as: physical properties of drug molecules; complexation and protein binding; principles of interfacial phases; theories and principles of the different types of dispersed systems and fundamental principles of rheology. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6313 - Advanced Physical Pharmacy III. Two (2) credits. Pre-requisite: FAFI 6312.
This course is essential for the students to understand the physical and chemical properties of new medicinal products. In this course will provide the students broad principles in an attempt to predict solubility, stability, compatibility and biological action of drug products. Emphasis is placed upon the application of scientific principles to practical professional problems. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6321 - Pharmaceutical Unit Operations I. Two (2) credits. Pre-requisite: FAFI 6311.
An introduction to the theory and applications of fluid flow, and the theory and mechanisms of heat transfer. The emphasis will be on applications in the pharmaceutical industry. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6322 - Pharmaceutical Unit Operations II. Two (2) credits. Pre-requisite: FAFI 6321.
Application of momentum, heat and mass transfer principles in the design of separation processes. An introduction to the theory and applications of particulate solids. The emphasis will be on the applications in the pharmaceutical industry. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6355 - Drug Metabolism. Two (2) credits.
The overall objective of this course is to enable the student to predict, from a drug's structure its probable metabolites and their potential for toxicity. In the first part of the course, the physiological processes of drug absorption, distribution and elimination will be briefly reviewed, and the major pathways of drug biotransformation will be studied in detail from an enzymatic basis. Phase I reactions due to monooxygenases (Cytochrome P-450 and Flavin Monooxygenases) will be studied in detail. Examples of metabolic activation and biotransformation of xenobiotics, including drugs, environmental pollutants and naturally occurring toxic chemicals will be given. The second part of the course will deal with the Phase II reactions. Various conjugating enzymes and the reactions they catalyze will be studied using examples of drugs and xenobiotic compounds. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6400 - Seminar in Industrial Pharmacy. Two (2) credits.
Research work under the supervision of a member of the Industrial Pharmacy faculty. The students will prepare and submit a report to be evaluated by the faculty. The students can take the course more than once with the authorization of the professor. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6500 - Projects in Industrial Pharmacy. Two (2) credits. Pre-requisites: FAFI 6511, FAFI 6512.
Research work under the supervision of a faculty member of Industrial Pharmacy. The students will prepare and submit a report to be evaluated by faculty. The students can register for the course more than once with the authorization of the professor. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6511 - Industrial Pharmaceutical Technology I. Two (2) credits. Pre-requisite: FAFI 6311.
This course will provide knowledge concerning design, manufacture and control of pharmaceutical dosage forms. This course will teach the students concepts, new theories and their practical applications in the development and production of dosage forms and in drug delivery systems. This course will direct the students to new production process and machines for manufacture, new control methods for accurate definition of drug delivery and new improved controlled procedures. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6512 - Industrial Pharmaceutical Technology II. Two (2) credits. FAFI 6511.
This course will provide knowledge related to the fundamental concepts that lead to an understanding of the techniques employed in the chemical and pharmaceutical industries to obtain satisfactory mixing. Through this course the fundamental concepts of drying and the principles of milling will be provided. In addition, the course describes the physics, mechanics and unit operation of compaction; tablet coatings principles, theories and equipment; granulation, microencapsulation, capsules among others. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6600 - Pharmaceutical Quality Control. Two (2) credits. Pre-requisite: FAGG 6100.
This course will discuss the concepts for statistical control and the improvement of quality in pharmaceutical processes. Furthermore, the management of total quality, control charts and experimental design will be addressed. Finally, the student will be able to estimate and interpret process capacity of pharmaceutical processes. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6650 - Statistical Quality Control. Two (2) credits.

FAFI 6700 - Advanced Biopharmaceutics and Pharmacokinetics. Two (2) credits.
The course exposes the student to the absorption, distribution, and drug elimination concepts. The factors in the formulation of the pharmaceutical products that affect bioavailability are discussed. The physiological conditions that can affect the kinetics and dynamics of some drugs are presented. The course also exposes the students to data shaping or pattern-making techniques. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFI 6750 - Industrial Management. Two (2) credits.
Basic theory and methods for analysis, design, installation, and maintenance of operational and management systems involved in the production and distribution of pharmaceutical goods and services will be covered. Planning, organization, scheduling, personnel, allocation, and control for productivity improvement and effective utilization of resources will be emphasized. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFT 6311 - Advanced Pharmacology I. Two (2) credits.
This course deals with the structure and function of biomolecules, including proteins, enzymes, nucleic acids, lipids, carbohydrates, vitamins and hormones. It also deals with the transformations, interactions and energy changes of these biomolecules (metabolism) in the different cells of the organism and how these reactions are regulated under ever changing environmental conditions and during cell differentiation (genetic and epigenetic regulation). The origin of “high energy” biomolecules are described mainly in relation to mitochondrial function and their participation in energy requiring processes. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFT 6312 - Advanced Pharmacology II. Two (2) credits.
Discussion of the action mechanisms of drugs in the systems and the organism. Examples are presented on how the drugs modify the biological function, and the therapeutic and adverse effects are studied. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAFT 6550 - Special Topics in Pharmacology. Two (2) credits.
Selected topics in Pharmacology will be discussed; depending on the professor, topics can include autonomic, cardiovascular or central nervous system agents. Student can register in this course more than once if topics to be discussed are different and with authorization of the professor. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAGG 6100 - Statistics in Pharmacy. Two (2) credits.
Basic statistical concepts, probability concepts, presentations, data charts, and parametric and non-parametric statistical methodology are discussed, in addition to experimental designs in the pharmaceutical sciences context. In this course, lecture, student oral presentation and internet search will be used among other instructional strategy.

FAGG 6200 - Drug Literature Evaluation. Two (2) credits.
Drug Literature Evaluation is designed to introduce the student to basic areas of study that enhance their ability to deal with and utilize this information. The course is a combination of group discussion and lecture. This course requires extensive hands-on practice by the student to create and execute effective search strategies of the medical literature. It also requires comprehensive evaluations of the medical literature. There is no standard text for this course. Material will be excerpted from journal reading assigned by the instructors. In this course, lecture, student oral presentation and internet search will be used among other instructional strategy.

FAGG 6213 - Special Topics in Pharmaceutical Sciences. Two (2) credits.
Selected Topics in Pharmaceutical Sciences will be discussed. It requires previous authorization of the professor in charge of the course. The topics included, depending on the professor in charge of the course, can be: antiinfectious, autonomic agents, molecular pharmacology concepts, neuropharmacology, nuclear pharmacy, structure activity relationships, biopharmaceutics, cardiovascular or central nervous system agents. Students are permitted to register more than once in this course with the professor and its mayor advisor's permission when the topics presented are different. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAGG 6300 - Principles of Research Design. Two (2) credits.
This course will supply and develop in the students the skills necessary for writing a successful research proposal including basic concepts, statement of the problem, hypothesis, objectives, design of experiments, experiment planning, analysis of the data and documentation of results. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAGG 6800 - MS Research. Two to four (2-4) credits.
Research oriented towards dissertation of the thesis for Master of Science in Pharmacy. Not more than four (4) credits will be accredited to the masters program, even though the student can register a total of 16 credits. Grading System: Passed (P), Not Passed (NP).

FAGG 6900 - Thesis. Two (2) credits.
Results are presented as a written dissertation. All candidates for Master of Science in Pharmacy (MS) have to register in this course in the trimester that there thesis defense will be presented. Grading System: Passed (P), Not Passed (NP).

FAQM 6351 - Instrumental Pharmaceutical Analysis I. Two (2) credits.
Presentation of the theoretical and practical principles of the advanced techniques used in the qualitative and quantitative analysis of drugs, its metabolites and excipients; in addition to endogenous substances in the biologic fluids and corporal tissues. The techniques are compared to determine the most capable in terms of applications depending on the situation. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAQM 6352 - Instrumental Pharmaceutical Analysis II. Two (2) credits. Pre-requisite: FAQM 6351.
The theoretical and practical aspects of instrumentation used in chemical separations are presented. Among the techniques discussed are gas chromatography, liquid chromatography and capilar electrophoresis with their respective detection modes which are used to identify drugs. Advantages and disadvantages of the separation techniques depending on the situation. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAQM 6701 - Medicinal Chemistry I. Two (2) credits.
This is an intensive course in Organic Chemistry, intended to lay the background for the subsequent courses in Medicinal and Pharmaceutical Chemistry. At the same time, the course is intended to fill in the gaps for those students who did not major in Organic Chemistry at the undergraduate level. Each topic is covered at the basic level, and then treated in-depth, so that at the end of the course the students are well-prepared to master the advanced topics taught in Medicinal Chemistry II and III. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAQM 6702 - Medicinal Chemistry II. Two (2) credits. Pre-requisite: FAQM 6701.
The course covers the physical-chemical purpose of the drug action theory and effector-receptor. The methods to characterize the receptors will be studied. The drugs will be presented in groups, acting over neurotransmitters and receptors, neurohormones and its receptors, and the drug that affect the membranes, cell wall, enzymes and nucleic acids. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAQM 6703 - Medicinal Chemistry III. Two (2) credits. Pre-requisite: FAQM 6702.
Study of the structure-activity relationship in the design of medicinal products. Among the subjects to be covered are, dopamine and its receptors, seratonine and its receptors, biosynthesis of dopamine, histamine and its receptors, agonists and antagonists of dopamine, neurotransmitters of aminoacids, steroidal and peptic hormones, among others. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAQM 6705 - Seminar in Medicinal Chemistry. Two (2) credits. Pre-requisite: FAQM 6703.
This course shows the student the fundamentals to prepare an oral and written presentation of a subject assigned by the professor or chosen by the student. The student will prepare a poster from the oral presentation following some general rules. Different aspects of presentations will be worked such as: choosing an appropriate title, logical sequence, background, material presentation, duration of presentation, visual aid, use of physical resources. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAQM 6707 - Pharmacognosy and Natural Products. Two (2) credits. Pre-requisites: FAQM 6351, FAQM 6703.
Pharmacognosy literally means “knowledge of drugs”. From a historical point of view, the first drugs used by humans came from natural products, and so, Pharmacognosy has retained its basic concept. Inside the natural products range, the superior plants compose the highest percent of the source from where the drugs have been isolated. The objectives of the course are centralized in the isolation and determination of the

structure of the compounds from plants. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAQM 6710 - Applied Inorganic Chemistry. Two (2) credits.
The following methods used in the analysis of drugs and chemical substances will be discussed: visible, ultraviolet, fluorescence, atomic absorption and mass spectrometry. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FAQM 6720 - Applied Organic Chemistry. Two (2) credits.
Theoretical and practical aspects of the infrared spectroscopy and nuclear magnetic resonance methods will be covered with emphasis in recent development on instrumentation and interpretation of drug and natural products spectra. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FARM 6001 - Unit Operations I. Two (2) credits.
This course is designed as an introductory course in the Industrial Pharmacy sequence. It deals with the Unit Operations frequently employed in the Pharmaceutical Industry both in the development as well as in the production environment. Special attention is given to an in-depth discussion of such processes as milling, mixing, blending, heat transfer, sieving, sizing and particle size analysis.

FARM 6002 - Unit Operations II. Two (2) credits.
The course is designed as an introductory course in the Industrial Pharmacy Program. It deals with the Unit Operations frequently employed in the Pharmaceutical Industry both in the development as well as in the production environment. Special attention is given to an in-depth discussion of such processes as fluid mixing, filtration and clarification, micrometrics and particle size analysis.

FARM 6011 - Disease States and Therapeutics I. Two (2) credits.
The study of Disease States of the Cardiovascular System, their clinical manifestations, and their treatment. The role of the pharmacist in the management and/or prevention of these conditions is emphasized.

FARM 6012 - Disease States and Therapeutics II. Two (2) credits.
The study of common chronic Disease States of Endocrine and Respiratory System, their clinical manifestations, and their treatment. The role of the pharmacist in the management and/or prevention of these conditions is emphasized.

FARM 6013 - Disease States and Therapeutics III. Two (2) credits.
Study of major psychiatric disorders and renal diseases, their clinical manifestations and their treatment. The role of the pharmacist in the management and/or prevention of these conditions is emphasized.

FARM 6014 - Disease States and Therapeutics IV. Two (2) credits.
Study of infections and oncologic diseases, their clinical manifestations and treatment, the role of the pharmacist in the management and/or prevention of these conditions is emphasized.

FARM 6089 - Institutional Pharmacy Administration I. Two (2) credits.
The focus of this course will be Procedure Manuals, Budgeting Process (Operational and Personnel), Cost Containment Procedures, Reimbursement Systems, Purchasing, Inventory Control and Personnel Management.

FARM 6095 - Institutional Pharmacy Administration II. Two (2) credits.
The focus of this course will be on Work Analysis and the Time Studies, Cost Analysis, Cost Control and Cost Benefit Studies.

FARM 6096 - Statistical Quality Control. Two (2) credits.
Basic aspects and methods for Quality Control Programs with emphasis on process control, acceptance techniques and special job studies.

FARM 6097 - Advanced Physical Pharmacy I. Two (2) credits.
Application of selected physical-chemical principles to homogeneous systems used in the development of pharmaceutical dosage forms.

FARM 6098 - Advanced Physical Pharmacy II. Two (2) credits.
Application of selected physical-chemical principles to homogeneous systems used in the development of pharmaceutical dosage forms.

FARM 6099 - Institutional Pharmacy Practice. Two (2) credits.
The pharmacist's role in 1, 2 and 3 Health Care Delivery Systems as well as basic institutional concerns such as unit-dose, intravenous additives, decentralized practice and quality assurance programs will be covered.

FARM 6105 - Advanced Biopharmaceutics and Pharmacokinetics. Two (2) credits.
Methods of optimizing drug delivery systems for various routes of administration based on biopharmaceutical and pharmacokinetics considerations.

FARM 6106 - Special Topics in Pharmacology. Two (2) credits.
Select topics in Pharmacology will be discussed. Depending on the instructor's preferences, topics may include, among others, Automatic Agents, Cardiovascular Agents or Central Nervous System Agents. Students will be allowed to take this course more than once, when and if the subject matter is different, by permission of the instructor.

FARM 6150 - Phytochemistry. Two (2) credits.
Biosynthesis routes and the chemotaxonomic relations of the alkaloids, flavonoids, steroids, terpenoids and secondary products related to natural origins which are very important in Pharmacy will be covered. In this course lecture, student oral presentation and internet search will be used among other instructional strategy.

FARM 6201 - Spectroscopic Analysis I. Two (2) credits.
Discussion of visible, ultraviolet, fluorescence, atomic absorption and mass-spectrometric methods of analysis of drugs and chemicals.

FARM 6202 - Spectroscopic Analysis II. Two (2) credits.
This course focuses on the theoretical and practical aspects of Infra Red (IR) and Nuclear Magnetic Resonance (NMR) Spectroscopy. Special emphasis is placed on recent development in instrumentation and on interpretation of drug and natural product spectra.

FARM 6210 - Statistics in Pharmacy. Two (2) credits.
Introduction to basic statistical methods used in Pharmacy with special emphasis on areas of faculty activity and interests.

FARM 6231 - Advanced Pharmaceutical Analysis I. Two (2) credits.
A presentation of the theoretical and applied principles of advanced techniques used in the quantitative analysis of drugs, their metabolites and endogenous substances in biological fluids and tissues.

FARM 6241 - Advanced Biological Chemistry I. Two (2) credits.
Introduction to biomolecules and their importance in cell structure, genetics, intermediary metabolism and bioenergetics. Also included is a discussion of enzymes, enzyme kinetics, and mechanisms of enzyme reactions.

FARM 6251 - Advanced Pharmacology I. Two (2) credits.
A discussion of the pharmacological basis of drug action at the molecular level. Topics covered will include: Dose Response Relationships, Mechanism of Drug Action and Interaction at the Receptor Level, Relationships between Chemical Structure and Pharmacological Activity, Neurotransmitter Dynamics, and Biochemistry and Metabolism.

FARM 6301 - Industrial Pharmaceutical Technology I. Two (2) credits.
A study of the processes and equipment involved in the manufacture of solid dosage form.

FARM 6302 - Industrial Pharmaceutical Technology II. Two (2) credits.
A study of the processes and equipment involved in the manufacture of semi-solid and liquid dosage forms.

FARM 6303 - Evaluation of Pharmaceutical Dosage Forms. Two (2) credits.
A discussion of the physical and physical-chemical methods used to evaluate pharmaceutical dosage forms.

FARM 6310 - Seminar in Industrial Pharmacy. Two (2) credits.
Seminar in Industrial Pharmacy in which discussions will focus on current literature with a view toward evaluation of methodology and presentation of data.

FARM 6315 - Projects in Industrial Pharmacy. Two (2) credits.
Investigation work in Industrial Pharmacy under the supervision of a member of the Industrial Pharmacy Faculty. Preparation and submission of report to be evaluated by the faculty. Students may be allowed to take this course more than once, by permission of the instructor.

FARM 6321 - Pharmaceutical Unit Operations I. Two (2) credits.
Theory and practice of the Unit Operation related to Industrial Pharmaceutical Technology such as drying, communication, micrometrics and particle size analysis, blending and compaction will be covered.

FARM 6322 - Pharmaceutical Unit Operations II. Two (2) credits.
Basic of theory and practice of the Unit Operations related to Industrial Pharmaceutical Technology II such as heat transfer, filtration, clarification, and fluid mixing will be covered.

FARM 6330 - Industrial Management. Two (2) credits.
Methods and theoretical foundation for analysis, design, installation, and maintenance of operational and management systems involved in the production and distribution of pharmaceutical goods and services are discussed. Planning, organization, scheduling, personnel, allocation, and control for productivity improvement and effective utilization of resources are emphasized.
FARM 6340 - Controlled Release Drug Delivery Systems. Two (2) credits.
A study of the theory and technology of Controlled Release Drug Delivery Systems.

FARM 6410 - Seminar in Institutional Pharmacy. Two (2) credits.
Seminar in Institutional Pharmacy in which each student independently carries out a chosen in-depth literature review of a subject of interest with guidance of the faculty responsible for the course. The student presents a written report and gives an oral presentation of the subject.

FARM 6420 - Health Care Administration. Two (2) credits.
The socioeconomic and statistics of health care, including governmental programs, legislative trends, third-party insurance and welfare programs, and other areas that may affect the management of the modern Institutional Pharmacy.

FARM 6550 - Thesis. Two (2) credits.

FARM 6552 - Advanced Pharmacology II. Two (2) credits.
The mechanisms of drug action as applied to specific organ systems as well as to the intact organism will be discussed. Examples of the modification of biological function and the therapeutic and adverse effects of drugs will be presented.

FARM 6990 - Master in Sciences Research Proposal. Two (2) credits.
Development of a MS Research Proposal that can be submitted to the students advisory committee, following the "Guidelines for the Master Thesis Proposal". A student may register for this course without credit, only to complete work "In Progress", for a maximum of two additional trimesters.

FARM 6995 - Master in Sciences Research. Two to four (2-4) credits.
Research toward the student's Dissertation. No more than four trimester credits in M.S. Research may be applied toward the Master Degree.

Interdisciplinary Course Descriptions
Undergraduate or Graduate Level Course Descriptions

INTD 5005 - Human Communications. Three (3) credits.
The course provides the students the opportunity to understand the normal development of communication in man. It identifies those factors that facilitate or hinder normal development of communication. Also, it will provide the opportunity to study the limitations due to physical, social and psychological variables and their management. This course is designed for graduate and post-bachelor level students.

INTD 5006 - Interdisciplinary Health Team Experience. Three (3) credits.
Field experiences with concurrent daily sessions for the development of the team, including analysis of the team concept, team characteristics, group dynamics, communication patterns, others. The conceptual framework of this course evolves around the development of a special project which can be of a clinical, community or organizational nature. Instructional methodology will include group exercises for teamwork skill development, group discussions and development, group discussions and development of a special project.

INTD 5116 - Incorporation of Technology in the Designing of Educational Activities. Three (3) credits
This is a multidisciplinary course created for undergraduate and graduate students. The course exposes students to the basic concepts of teaching-learning and develops skills in the use of technology for the development of educational activities relevant to the discipline of the student. The course will discuss topics as: planning and implantation of educational activities and the use of computerized programs of word processing and design of presentations, for the creation of articles and poster boards as educational materials.

Graduate Level Course Descriptions

INTD 6025 - Interdisciplinary Health Team Practice. Three (3) credits
Students from different health disciplines will be introduced to the basic concepts of interdisciplinary team practice in the delivery of health care services. Future health professionals will be provided with the basic skills required to work effectively in interdisciplinary health teams. They will collaborate in group exercises and activities designed to develop a greater understanding of the roles of different professions in an interdisciplinary health team. Students will be able to recognize and define their professional perspective and expertise, as well as, identify the expertise and competence of other health professionals. The course will combine classroom lectures, group discussions, and exercises with practice in a health care center. At the health care center, students will consult with health care providers working in interdisciplinary teams. They will also participate in case conferences, and will develop health care plans

INTD 7005 - Interdisciplinary Health Team Practice. Eighty to one hundred and sixty (80-160) Hours
Students from different health disciplines will be introduced to the basic concepts of interdisciplinary team practice in the delivery of health care services. Future health professionals will be provided with the basic skills required to work effectively in interdisciplinary health teams. They will collaborate in group exercises and activities designed to develop a greater understanding of the roles of different professions in an interdisciplinary health team. Students will be able to recognize and define their professional perspective and expertise, as well as, identify the expertise and competence of other health professionals. The course will combine classroom lectures, group discussions, and exercises with practice in a health care center. At the health care center, students will consult with health care providers working in interdisciplinary teams. They will also participate in case conferences, and will develop health care plans. Grading System: Passed (P), Not Passed (NP)

INTD 7995 - Complementary Practices for Health and Healing. Three to five (3-5) credits
The course gives an overview of various health belief systems in Complementary and Alternative Medicine (CAM) and examines the current trends in the utilization of some of these practices and its implications. Specific therapeutic practices will be discussed. Information resources of natural products will also be reviewed. The paradigms in which biomedical model is based, its strengths and limitations will be discussed, as well as comparison with other healing philosophies and practices. Most common forms of healing practices, its theories, proposed mechanism of action, specific indication, expected results, available scientific evidence, contraindications, adverse effects, and interactions or interference between conventional and non-conventional practices will be study. This course will be offered at the undergraduate, graduate, and first professional level. For medical school students the number of hours will fluctuate between 80-160 hours. The instructional strategies will include lecture, discussion, practical experience, case study, and workshop.

Faculty

ALMODÓVAR-CARABALLO, EDNA N. - *Associate Professor*; PharmD, 1997, University of Kansas.
BLOOM-OQUENDO, JOSEPH - *Professor*; PhD, 1991, University of Puerto Rico- Río Piedras Campus.
BRIGANTTI BENGOCHEA, CLARA T. - *Instructor*; MA, 1994, New York University.
CARO-DÍAZ EDUARDO- *Associate Professor; PhD, 2014, University of California, San Diego.*
COLÓN SÁEZ, JOSÉ O. – *Associate Professor*; PhD, 2008, University of Minnesota.
CRUZ-GONZÁLEZ, IADELISSE - *Professor*; PharmD, 2001, Nova Southeastern University.
DAHIYA SUNITA- *Associate Professor; PhD, 2012, Gautam Buddha University-Uttar Pradesh-India.*
DUCONGE-SOLER, JORGE - *Professor*; PhD, 1999, University of Havana - Cuba.
FIGUEROA-RÍOS, DENISE - *Associate Professor*; PharmD, 2004, Nova Southeastern University.
GARCÍA-BERDECIA, RAFAEL - *Assistant Professor*; MPH, 1989, University of Puerto Rico - Medical Sciences Campus.
GUZMÁN-BADILLO, JENNIFER - *Professor*; PharmD, 1999, Nova Southeastern University.
HERNÁNDEZ AGOSTO, JONATHAN – Associate Professor; EdD., 2008, Interamerican University of Puerto Rico.
HERNÁNDEZ-O'FARRILL, ELIUD - *Associate Professor*; PhD, 2006, University of Puerto Rico - Río Piedras Campus.
JIMENEZ-RAMIREZ, FRANCISCO J. - *Professor*; PharmD, 1999, Temple University.
LÓPEZ-NIEVES, MARISOL – *Assistant Professor*; PharmD, 2021, Shenandoah University.
MALDONADO-DÁVILA, WANDA T. - *Professor*; PharmD, 1986, University of Maryland.
MARTÍNEZ-FERRER, MAGALY - *Professor*; PhD, 2003, Alabama A&M University.
MELIN, KYLE – *Associate Professor*; PharmD, 2009, Ohio Northern University.
MIRANDA-MASSARI, JORGE R. - *Professor*; PharmD, 1990, Philadelphia College of Pharmacy and Sciences.
ORTIZ-DE HOYOS, NESTOR - *Adjunct Professor*; JD, 2017, Interamenrican University of Puerto Rico.
PEDRO-GUTIERREZ, ELSA - *Associate Professor*; PharmD, 2006, Nova Southeastern University.
REYES-PEREZ, ZAYRA M. - *Counselor*; MRC, 1989, University of Puerto Rico – Río Piedras Campus.
RIVERA-SARATE, SACHA - *Professor*; PharmD, 2001, Purdue University.
RODRÍGUEZ NAZARIO, ILEANA – *Associate Professor;* PharmD, 2014, University of Puerto Rico – Medical Sciences Campus.
RODRÍGUEZ-CINTRÓN, FRANCES M. - *Professor*; PharmD, 1993, University of Michigan.
RODRIGUEZ-ESCUDERO, IDALIZ- *Associate Professor;* PharmD, 2017, University of Puerto Rico – Medical Sciences Campus.
SANTIAGO-QUIÑONES, DARLENE - *Associate Professor*; PhD, 2012, University of Puerto Rico - Mayagüez Campus.
STELZER-WIEGLEB, TORSTEN – *Associate Professor;* PhD, 2009, Marten Luther University Halle-Wittenberg, Germany.
TORRES-HERNANDEZ, BIANCA- *Assistant Professor*; PhD, 2014, University of Puerto Rico – Medical Sciences Campus.
VEGA-GERENA, MAYRA L. - *Associate Professor*; MPHE, 1990, University of Puerto Rico - Medical Sciences Campus.
VLAAR-STOOP, CORNELIS P. - *Professor*; PhD, 1994, VRYE Universiteit - Amsterdam.

FACULTY OF BIOSOCIAL SCIENCES AND GRADUATE SCHOOL OF PUBLIC HEALTH

HISTORY

The Faculty of Biosocial Sciences and Graduate School of Public Health is the unit of the Medical Sciences Campus dedicated to teaching, research, and service in the areas of public health and biosocial disciplines as they relate to the health sciences. Besides offering its master's and doctoral degree programs in core areas of public health, the School is responsible for the teaching of public health and biosocial contents to medical students and students in other schools of the Medical Sciences Campus.

The School of Public Health had its origin in the School of Tropical Medicine, which was founded in 1926 with support from the Rockefeller Foundation and under the auspices of Columbia University. The School of Tropical Medicine soon became a renowned center for research and postgraduate studies.

In 1941, at the request of the Department of Health, the School of Tropical Medicine developed graduate courses in the field of public health. These were primarily courses in sanitary engineering leading to a Master of Sanitary Sciences developed in response to the need for specialized personnel in that area. Subsequently, programs toward the Master of Public Health, Master of Health Education, and Master of Nursing were developed.

On May 15, 1949, the Puerto Rico Legislature approved Public Law No.378 authorizing the creation of a School of Medicine at the University of Puerto Rico. The School began operations in the fall of 1950. The Department of Preventive Medicine and Public Health was part of the School of Medicine from its inception. It offered courses in preventive medicine and public health to medical students. In 1955, the Department of Preventive Medicine and Public Health was accredited by the American Public Health Association, a function carried by APHA until 1974 when the Council on Education for Public Health was created. In 1956, the School (still a department of the School of Medicine) assumed an important role in the regionalization of health services in the Island, a plan by which primary, secondary, and tertiary care services were delivered in a coordinated fashion throughout the Island in order to maximize utilization of resources. The School's primary role was and continues to be to train the necessary human resources to deliver many of those services, and one of assessing health needs in the community in order to respond with relevant curricular changes.

Due to the outstanding contribution of the Department of Preventive Medicine and Public Health and its teaching programs in the development and organization of health care services in the Island, and due to the growth of its programs, the Academic Senate of the Medical Sciences Campus recommended the creation of the Graduate School of Public Health. On January 27, 1970, the Council on Higher Education authorized, through Certification 42, the creation of the Graduate School of Public Health of the Medical Sciences Campus, which comprised 13 programs. The School thus gained independent status. In 1972, the Medical Sciences Campus moved from the old building of the School of Tropical Medicine in San Juan to a new 10-story building near the University Hospital and other health institutions within the Puerto Rico Medical Center in Río Piedras. That same year the Graduate School of Public Health moved to its facilities within the new building (now Guillermo Arbona Irizarry Building). In 1976, the Council on Higher Education authorized a total reorganization of the Medical Sciences Campus. As part of that reorganization, the School became the Faculty of Biosocial Sciences and Graduate School of Public Health.

In 1981, following the recommendation of the faculty, the School was reorganized into five departments: Health Services Administration, Biostatistics and Epidemiology, Environmental Health, Human Development, and Social Sciences.

This new organization reflected more adequately the School's mission, goals, its interdisciplinary character, and commitment to train a new type of public health professional. The eighties were a decade of growth and strengthening of the School's programs in response to social needs and areas of concern in the field of public health. It was a period of development of the biosocial sciences, as evidenced by the creation of the Center for Census Data, the Center for Sociomedical Research, and the Center for Demographic Research. In keeping with the needs of an aging population, the School also created a graduate certificate in Gerontology. It was also involved in outreach efforts through continuing education, extension and extramural courses and programs. In 1984 and 1985, it began offering Master of Science with specialty in Environmental Health, currently an MPH with specialty in Environmental Health, and a Master of Public Health evening programs. An extramural program with the University of Cádiz, Spain, began in 1986. Through this collaborative effort, the faculty offered courses at the University of Cádiz leading to the Master of Public Health and a Master of Science with specialty in Environmental Health.

In 1993, the School established the Child Development Center as an exemplary service center, practicing inclusion of infants and toddlers from two months to three years of age. New additions to the School's academic offerings in the 1990s included a graduate certificate in Developmental Disabilities-Early Intervention, offered by the Center for Developmental Disabilities though the Human Development Department, and an MPH program with a specialty in Gerontology and a program leading to a Master of Public Health Education, both offered as evening programs. In 1996, the Occupational Health Program became a Master of Science with specialty in Industrial Hygiene. In 1998-1999, the Department of Human Development added two new programs, a Master of Public Health with specialty in Nurse Midwifery and a Graduate Certificate in Nurse-Midwifery. These programs prepared professionals in the women's health care area, particularly in the processes of pregnancy and childbirth, as well as in family planning and newborn care.

In 1999-2000, the School began offering the Doctor of Public Health with a specialty in Environmental Health degree. A second DrPH program in Health Systems Analysis began in 2010-2011 and a third one in Social Determinants of Health began in 2011-2012. The School is currently working on the creation of a doctoral degree in Biostatistics and Epidemiology.

VISION

Be the leading institution in public health for the development and integral well-being of the population at the community, national and international levels.

MISSION

Advance public health through the development of leaders, the creation of new knowledge, and the offering of services that contribute to the sustainable well-being of society.

VALUES

Graduate School of Public Health is guided by universal human values of Social Justice and Equity. Its commitment is with the following core values identified through the strategic planning process:

- Recognition of health as an inalienable right of every human being.
- Respect for the dignity, diversity, and integrity of the human being.
- Solidarity with and sensitivity towards vulnerable populations.
- Responsibility, honesty, and professionalism in our academic work.
- Interdisciplinary and interprofesional teamwork.

- Continuous and responsible improvement.
- Commitment with socio-cultural values of the Puerto Rican nation.

ORGANIZATION AND ADMINISTRATION

The School is headed by the Dean, who is assisted by the Associate Dean for Academic Affairs, the Assistant Dean for Student Affairs, the Associate Dean for Research, and administrative personnel. Five departments offer academic programs in basic areas of public health. These are the Departments of Health Services Administration, Biostatistics and Epidemiology, Environmental Health, Human Development, and Social Sciences.

The Division of Continuing Education and Professional Studies, the Curriculum and Evaluation Office, and the Office of the Dean for Student Affairs, as well as several research and service programs, are other significant components of the School.

PROGRAMS OF STUDY

The School currently offers nine professional masters' degree programs, four academic masters' degree programs, four graduate certificates and three doctoral programs. The Master of Public Health Program has five specialty options: Epidemiology, Biostatistics, Environmental Health, Gerontology, Public Health Education, and a General Option. Some of these programs are offered in day and evening schedules. The academic masters' degrees are Demography, Nutrition, Industrial Hygiene, and Epidemiology. The school offers a Master of Public Health equivalent degree program in Health Services Administration. A Doctor of Public Health Program began in 1999-2000 offering a specialty in Environmental Health and in 2010-2011 began the Doctor of Public Health with Specialty in Health Systems Analysis and Management. A third doctoral program of Public Health with specialty in Social Determinants of Health began in 2011-2012. **Students are encouraged to contact individual programs for updates on requirements, curricula, and new offerings**.

ACCREDITATION

The Graduate School of Public Health is the only school in Puerto Rico accredited by the Council on Education for Public Health, 1010 Wayne Avenue, Suite 220, Silver Spring, MD 20910.

Phone: (202) 789-1050
Fax: (202) 789-1895
Web: http://www.ceph.org/

GENERAL ADMISSION REQUIREMENTS OF THE SCHOOL

MASTER's DEGREES AND GRADUATE CERTIFICATE PROGRAMS

Applicants for admission to the Graduate School of Public Health master's degrees and graduate certificates must meet the general admission requirements of the School as listed below and specific program requirements. The general admission requirements for the School are:

- Hold a bachelor's degree or equivalent by a college or university of recognized standing with a GPA 2.85 or more.

- The Faculty of Biosocial Sciences and Graduate School of Public Health established a minimum admission index of 65% for certificate programs and 70% for the master's degrees.
- Fluency in Spanish and ability to read and understand English (Classes are conducted in Spanish).
- Personal interview.
- Submit two letters of recommendation that address the candidate's academic and professional development and performance (candidate's work and professional and/or research experience and/or service experience).
- Resume or CV that provides evidence for the evaluation of work experience in conjunction with the letters of recommendation.
- Submit an essay in the format established by the selected academic program.
- Meet the specific requirements of the student's program of choice. (See sections on individual programs).

DOCTORAL DEGREE PROGRAMS

Applicants for admission to the Graduate School of Public Health doctoral degrees must meet the general admission requirements of the School as listed below and specific program requirements. The general admission requirements for the School are:

- A Master's degree in a discipline offered by a school of public health recognized by the international academic community. Applicants who hold a Master's degree in other disciplines must have completed a graduate course in Biostatistics or Statistics, Inferential Statistics, Epidemiology, and an Introductory Course in Public Health with A or B. It is highly recommended that they have knowledge and skills in information literacy/systems and their applications.
- It is highly recommended that applicants be fluent in Spanish and have adequate/proper comprehension of the English language.
- Grade point average of 3.00 (on a scale of 4.00) at the master's level or its equivalent. Applicants should have a composite admission score of 75% or more, as calculated by the GSPH admission formula.
- Teaching, research, or service experience in the field of public health.
- All DrPH specialties require students to approve a statistical inference course at the graduate level with A or B prior to admission to the doctoral program.
- Once students are enrolled in the doctoral program, no waivers will be granted regarding the requirement of core courses or specialty courses that pertain to the DrPH curricular sequence. This norm will be applicable to all DrPH specialties.
- Interview with the Doctoral Program Admissions Committee.

MASTER OF PUBLIC HEALTH GENERAL OPTION (DAY AND EVENING PROGRAMS)

The Master of Public Health Program focuses on the study of concepts and practices related to the socio-cultural aspects of health. Its curriculum covers topics on community health problems, underscoring the identification and understanding of factors and circumstances that determine health and disease.

The study of public health requires skills in the diagnosis of community health problems and the planning, implementation, administration, and evaluation of community health programs. The field of public health seeks the integration of several areas of knowledge in order to design and implement health programs that will meet the needs of the community.

In order to promote changes in health status of population, the public health graduate will be qualified to participate in research community health issues. The graduate will also be competent to design, apply and evaluate public health policies, health promotion and prevention interventions, and program development and management in organizational and community initiatives. Graduates are usually employed by the government, as well as by the private sector.

Specific Admission Requirements

Besides the general admission requirements of the School, the applicant should have approved a statistics or biostatistics course of higher education level.

Graduation Requirements

Upon meeting the following requirements, the student will receive a Master of Public Health degree:

- Completion of the 55-credit hour + 12 hours program (52 in required courses, and 3 in elective courses).
- Overall grade point average of at least 2.50 and 3.00 in the specialty.

MASTER OF PUBLIC HEALTH GENERAL OPTION CURRICULUM

Total Trimester Credit-Hours: 55 + 12 hours

SALP 6006	Introduction to Public Health	3
ADSS 6516	Fundamentals of Health Policy and Management in Public Health	4
BIOE 6525	Statistical Analysis	5
CISO 6546	Social Determinants and Equity in Public Health	3
EPID 6523	Epidemiological Methodology	4
ADSS 6594	Public Health Program Planning and Evaluation	4
SAAM 6528	Principles of Environmental Public Health	3
SALP 6250	Applied Public Health Research Methods	3
SALP 6251	Leadership in Public Health	2
INTD 6996	Inter-professional Collaborative Practice in Public Health	0 (12 hours)
ADSS 6555	Legislative Process for Public Health Professionals	3
ADSS 6621	Financial Resources Management for Public Health Organizations	3
ADSS 6584	Health Politics and Policy	3
SALP 6005	Foundations of Health Promotion	3

ADSS 6620	Advanced Public Health Policy Analysis	3
SALP 6997	Integrative Experience in General Public Health	5
SALP 6995	Applied Practice Experience: General Public Health	1
Electives		3

MASTER OF PUBLIC HEALTH WITH SPECIALTY IN BIOSTATISTICS

The Master of Public Health with Specialty in Biostatistics develops in students the knowledge, skills, and attitudes needed to apply statistical methodologies in the planning and implementation of studies and research in the area of community health.

Specifically, the program graduate will deal proficiently with statistics in the health field, apply appropriate statistical methodology in the classification, presentation, analysis, and interpretation of health data, as well as collaborate in the design and implementation of evaluation models for health programs. Graduates also advise health agencies and organizations on the application of statistical theories and methodologies.

Specific Admission Requirements

Approve with a minimum grade of B three (3) credits in:
Introductory course in statistics, biostatistics, or their equivalent at a college level.
Approve Calculus I, MECU, or equivalent.

Graduation Requirements
Students will receive a Master of Public Health degree with Specialty in Biostatistics upon meeting the following requirements:

Completion of the 56-credit hour + 12 hours program (56 required courses) credits).
Overall grade point average of at least 2.50 and 3.00 in the specialty.

MASTER OF PUBLIC HEALTH WITH SPECIALTY IN BIOSTATISTICS CURRICULUM

TOTAL TRIMESTER CREDIT HOURS: 56 + 12 hours

SALP 6006	Introduction to Public Health	3
ADSS 6516	Fundamentals of Health Policy and Management in Public Health	4
BIOE 6525	Statistical Analysis	5
CISO 6546	Social Determinants and Equity in Public Health	3
EPID 6523	Epidemiological Methodology	4
ADSS 6594	Public Health Program Planning and Evaluation	4
SAAM 6528	Principles of Environmental Public Health	3
SALP 6250	Applied Public Health Research Methods	3
SALP 6251	Leadership in Public Health	2
INTD 6996	Inter-professional Collaborative Practice in Public Health	0 (12 hours)
BIOE 6535	Statistical Inference	4
BIOE 6537	Non-Parametric Statistical Inference	3
BIOE 6545	Introduction to Sampling Theory	3
BIOE 6555	Regression and Correlation Analysis	3
BIOE 6605	Statistical Computing Applied to Public Health	4
EPID 6524	Community Health Needs Assessment	2
SALP 6999	Capstone Project in Public Health: Epidemiology and Biostatistics	5

EPID 6995	Applied Practice Experience: Epidemiology and Biostatistics	1

MASTER OF PUBLIC HEALTH WITH SPECIALTY IN EPIDEMIOLOGY

The Master of Public Health with Specialty in Epidemiology prepares students to analyze data on diseases, investigate epidemics, and collaborate with other professionals in the prevention and control of diseases. As professionals in one of the main areas of public health, epidemiologists study the distribution of disease in the population, as well as factors associated with the increase or decrease in the incidence of such diseases.

Graduates often work for government agencies and the private sector in research programs focusing on the distribution of disease in the population and on related factors. They also participate in educational activities geared towards prevention.

Specific Admission Requirements

Besides the general admission requirements of the School, the applicant should have approved a statistics or biostatistics course of higher education level.

Graduation Requirements

Students will receive a Master of Public Health degree with Specialty in Epidemiology upon meeting the following requirements:

Completion of the 56-credit hour + 12 hours program (56 in required courses).
Overall grade point average of at least 2.50 and 3.00 in the specialty.

MASTER OF PUBLIC HEALTH WITH SPECIALTY IN EPIDEMIOLOGY CURRICULUM

TOTAL TRIMESTER CREDIT HOURS: 56 + 12 hours

SALP 6006	Introduction to Public Health	3
ADSS 6516	Fundamentals of Health Policy and Management in Public Health	4
BIOE 6525	Statistical Analysis	5
CISO 6546	Social Determinants and Equity in Public Health	3
EPID 6523	Epidemiological Methodology	4
ADSS 6594	Public Health Program Planning and Evaluation	4
SAAM 6528	Principles of Environmental Public Health	3
SALP 6250	Applied Public Health Research Methods	3
SALP 6251	Leadership in Public Health	2
INTD 6996	Interprofessional Collaborative Practice in Public Health	0 (12 hours)
EPID 6528	Epidemiology of Mental Disorders	3
EPID 6529	Epidemiology of Chronic Diseases	3
BIOE 6526	Applied Statistics Methods in Epidemiology	2
EPID 6535	Epidemiology of Infectious Diseases	4
EPID 6536	Epidemiology and Pathogenesis of Cancer	3
EPID 6527	Public Health Surveillance	2
EPID 6524	Community Health Needs Assessment	2
SALP 6999	Capstone Project in Public Health: Epidemiology and Biostatistics	5
EPID 6995	Applied Practice Experience: Epidemiology and Biostatistics	1

MASTER OF PUBLIC HEALTH WITH SPECIALTY IN ENVIRONMENTAL HEALTH
(DAY AND EVENING PROGRAMS)

The Master of Public Health with Specialty in Environmental Health Program prepares specialists in environmental health with skills to assume responsibilities in the planning and administration of environmental health programs, conduct research, and work in numerous community programs focusing on environmental concerns.

The program graduate is familiar with social, economic, and scientific factors bearing on appropriate solutions to contemporary problems in environmental health, particularly those affecting Puerto Rico. This entails viewing natural resources, industrial growth, energy use, and demographic factors as they affect the environment.

Students have the opportunity to explore several areas of environmental health including water and air pollution, food hygiene, environmental radiation, solid waste management, environmental microbiology, environmental law, and geographical information systems, among others.

Specific Admission Requirements

Applicants must have approved the following courses at the undergraduate level:

a) A minimum of three credits course in each of the following areas:
Human Biology, General Biology, Physics, or Chemistry — 9 credits
b) College level Mathematics or Statistics — 3 credits

Graduation Requirements

The student will receive a Master of Public Health with Specialty in Environmental Health degree upon meeting the following requirements:

- Completion of the 58 credit hours + 12 hours program (52 in-required courses, and 6 in elective courses).
- Overall grade point average of at least 2.50 and 3.00 average in the field of specialty.

MASTER OF PUBLIC HEALTH WITH SPECIALTY IN ENVIRONMENTAL HEALTH CURRICULUM
(DAY AND EVENING PROGRAM)

Total Trimester Credit-Hours: 58 + 12 hours

SALP 6006	Introduction to Public Health	3
ADSS 6516	Fundamentals of Health Policy and Management in Public Health	4
BIOE 6525	Statistical Analysis	5
CISO 6546	Social Determinants and Equity in Public Health	3
EPID 6523	Epidemiological Methodology	4
ADSS 6594	Public Health Program Planning and Evaluation	4
SAAM 6528	Principles of Environmental Public Health	3
SALP 6250	Applied Public Health Research Methods	3
SALP 6251	Leadership in Public Health	2
INTD 6996	Inter-professional Collaborative Practice in Public Health	(12 hours)
SAAM 6531	Aquatic Systems and Public Health	3

SAAM 6534	Air Pollution and Public Health	3
SAAM 6535	Environmental Toxicology	3
SAAM 6541	Environmental Legislation	3
SAAM 6545	Food Safety	3
SAAM 6999	Capstone Project in Public Health: Environmental Health	3
SAAM 6995	Applied Practice Experience: Environmental Health	3
Electives		6

MASTER OF PUBLIC HEALTH WITH SPECIALTY IN GERONTOLOGY
(DISTANCE LEARNING PROGRAM IN HYBRID MODALITY AND EVENING PROGRAM)

The main goal of the Master of Public Health with Specialty in Gerontology Program is to train students in the design and management of programs that meet the needs of the elderly. The program is geared to applied areas, both academically and in the community setting, stressing an interdisciplinary approach. Program graduates are expected to promote changes that will benefit the elderly by advocating for better and more adequate public policies and providing services for this segment of the population.

The curriculum has been designed to analyze the process of aging with a holistic and interdisciplinary approach. Psychological, biological, sociological, anthropological, clinical, nutritional, and administrative aspects are examined as they relate to the elderly and the aging process, and from a public health perspective. Knowledge and skills acquired are applied in community practice activities.

Admission Requirements

Candidates for admission to the Master of Public Health with Specialty in Gerontology must comply with the general admission requirements of the School. In addition, applicants must have three credits in social sciences courses, three credits in biology, three credits in psychology, three credits in college level algebra, and 3 credits in statistic and biostatistics course of higher educational level. Applicants will also be required to present evidence of computer literacy. If the applicant does not possess these skills, arrangements will be made to provide training during the course of study.

Graduation Requirements

Students will receive a Master of Public Health degree with Specialty in Gerontology upon meeting the following requirements:

- Completion of the 58 credit hours + 12 hours program (55 in-required courses, and 3 in elective courses).
- Overall grade point average of at least 2.50 and 3.00 in the specialty.

MASTER OF PUBLIC HEALTH WITH SPECIALTY IN GERONTOLOGY CURRICULUM

Total Trimester Credit-Hours: 58 + 12 hours

SALP 6006	Introduction to Public Health	3
ADSS 6516	Fundamentals of Health Policy and Management in Public Health	4
BIOE 6525	Statistical Analysis	5
CISO 6546	Social Determinants and Equity in Public Health	3
EPID 6523	Epidemiological Methodology	4
ADSS 6594	Public Health Program Planning and Evaluation	4

SAAM 6528	Principles of Environmental Public Health	3
SALP 6250	Applied Public Health Research Methods	3
SALP 6251	Leadership in Public Health	2
INTD 6996	Inter-professional Collaborative Practice in Public Health	(12 hours)
GERO 6005	Introductory Seminar in Gerontology	1
GERO 6501	Biological Aspects of Aging	3
GERO 6503	Psychological Aspects of Aging	3
GERO 6505	Clinical Aspects of Aging	3
GERO 6507	Social Aspects of Aging	3
GERO 6509	Policy and Management Aspects in Gerontology	3
GERO 6508	Planning Field Experience in Public Health Gerontology	2
GERO 6997	Integrative Experience in Public Health: Gerontology	5
GERO 6995	Applied Practice Experience: Gerontology	1
Electives		3

MASTER OF SCIENCE WITH SPECIALTY IN EVALUATION RESEARCH OF HEALTH SYSTEMS

Note: The Master of Science with Specialty in Evaluation Research of Health Systems program is in a moratorium status.

MASTER OF HEALTH SERVICES ADMINISTRATION

The Master of Health Services Administration Program prepares health services administrators to be proficient in the planning, administration, operation, and evaluation of health services delivery systems.

In preparing highly qualified health services administrators to assume leadership positions in the health care field, the program emphasizes analytical research methodology focusing on an interdisciplinary approach for the solution of problems in the health care field.

Upon completion of the program of studies, graduates are eligible to apply for the licensure examination in Health Services Administration. Once they are licensed, they may serve as executive directors of health services facilities, executives or managers in the health insurance industry, consultants for pharmaceutical companies, and evaluators of health services institutions.

Specific Admission Requirements

Before admission, applicants must have completed the following courses, or their equivalents, in the areas specified below:

Required Courses	**Credit-Hours**
Accounting	3
Statistics or biostatistics	3
Economics	3
Mathematics (algebra, precalculus or calculus)	3
Business Finance	3

Work experience in the health care field is desirable.

Graduation Requirements

Students will receive a Master of Health Services Administration degree upon meeting the following requirements:

- Completion of the 67 credit-hour + 800 hours program (61 in required courses, and 6 in elective courses).
- Overall grade point average of at least 2.50 and 3.00 in the field of specialty.

MASTER OF HEALTH SERVICES ADMINISTRATION CURRICULUM

Total Trimester Credit-Hours: 67 + 800 hours

SALP 6006	Introduction to Public Health	3
EPID 6523	Epidemiological Methodology	4
SALP 6251	Leadership in Public Health	2
ADSS 6525	Introduction to Healthcare Management	3
ADSS 6535	Continuous Quality Improvement in Health Care	3
ADSS 6579	Organization Behavior	3
ADSS 6583	Legal Aspects in Health Services	3
ADSS 6584	Health Politics and Policy	3
ADSS 6585	Health Economics	3
ADSS 6586	Health Systems	3
ADSS 6591	Quantitative Decision-Making for Health Services Administration I	3
ADSS 6592	Quantitative Decision-Making for Health Services Administration II	3
ADSS 6490	Strategic Planning for Health Services Organizations	3
ADSS 6598	Information Systems in Health Services Administration	3
ADSS 6607	Health Care Cost	3
ADSS 6609	Health Care Financial Management	3
ADSS 6610	Principles of Health Insurance and Managed Care	3
ADSS 6625	Human Resources Management	4
ADSS 6548	Hospital Administration	3
ADSS 6606	Capstone Seminar in Health Services Administration	3
ADSS 6597	Administrative Residency	800 hours
Electives		6

MASTER OF SCIENCE WITH SPECIALTY IN EPIDEMIOLOGY

The Master of Science with Specialty in Epidemiology Program prepares professionals proficient in the utilization of epidemiological methodology in the study and solution of community health problems, and who will engage in teaching, research, and service in this area.

Program graduates are employed by government agencies and the private sector as epidemiologists, research assistants, data analysts, and coordinators of programs focusing on prevention.

Specific Admission Requirements

Students requesting admission to the Master of Science with Specialty in Epidemiology Program must have completed the following number of credits in the subjects specified below:

Required Courses	Credit-Hours
Biology	4
Psychology, Sociology or Anthropology	6
Mathematics (Including Calculus, and statistic or biostatistics in higher education level)	6

Graduation Requirements
Students will receive a Master of Science with Specialty in Epidemiology degree upon meeting the following requirements:

- Completion of the 76 credit-hour program (63 in required courses, and 13 in elective courses).
- Overall grade point average of at least 2.50 and 3.00 in the specialty.

MASTER OF SCIENCE WITH SPECIALTY IN EPIDEMIOLOGY CURRICULUM

Total Trimester Credit-Hours: 76

SALP 6006	Introduction to Public Health	3
SAAM 6528	Principles of Environmental Public Health	3
DEMO 6546	Mortality	4
BIOE 6525	Statistical Analysis	5
BIOE 6535	Statistical Inference	4
BIOE 6545	Introduction to Sampling Theory	4
BIOE 6555	Regression and Correlation Analysis	3
BIOE 6605	Statistical Computing Applied to Public Health	4
EPID 6523	Epidemiological Methodology	4
EPID 6527	Epidemiologic Surveillance	2
EPID 6528	Epidemiology of Mental Disorders	3
EPID 6529	Epidemiology of Chronic Diseases	3
EPID 6535	Epidemiology of Communicable Diseases and Epidemiological Surveillance	4
EPID 6539	Epidemiological Aspects of Public Health Problems	2
EPID 6552	Seminar in Epidemiology I	1
EPID 6553	Seminar in Epidemiology II	1
EPID 6554	Seminar in Epidemiology III	1
EPID 6555	Seminar in Epidemiology IV	1
EPID 6556	Seminar in Epidemiology V	1
EPID 6561	Epidemiological Research I	4
EPID 6562	Epidemiological Research II	4
EPID 6563	Epidemiological Research III	2
Electives		13

MASTER OF SCIENCE IN DEMOGRAPHY

The Master of Science in Demography Program prepares professionals in the theoretical and methodological aspects of the study of human populations. These include population growth, distribution, and characteristics, as well as mortality, fertility, migration, population problems, and policies.

Upon completion of the program of studies, graduates may conduct research, offer consulting services, and work as teachers in demography, population analysis, and other related areas. They will also be able to participate in programs geared to the solution of problems of a collective nature.

Specific Admission Requirements

Applicants must have approved the following number of credits in the subjects specified below:

Required Courses	Credit-Hours
Statistics or biostatistics	3

College Algebra 3

Graduation Requirements
Students will receive a Master of Science in Demography degree upon meeting the following requirements:

- Completion of the 70 credit-hour program (59 in required courses, and 11 in elective courses).
- Overall grade point average of at least 2.50 and 3.00 in the specialty.

MASTER OF SCIENCE IN DEMOGRAPHY CURRICULUM

Total Trimester Credit-Hours: 70

SALP 6006	Introduction to Public Health	3
BIOE 6525	Statistical Analysis	5
BIOE 6535	Statistical Inference	4
CISO 6547	Population and Society	3
EPID 6523	Epidemiological Methodology	4
DEMO 6500	Introduction to Demography	4
DEMO 6546	Mortality	4
DEMO 6555	Fertility and Population Growth	4
DEMO 6560	Research Methods	4
DEMO 6565	Migration, Population Distribution, and Urbanism	4
DEMO 6602	Seminar on Demographic Studies in Puerto Rico	3
DEMO 6606	Use of SPSS Program and other Scientific Research	4
DEMO 6607	Population and Economics	4
DEMO 6615	Supervised Practice in Demography	3
DEMO 6621	Research Project I	2
DEMO 6622	Research Project II	4
Electives		11

MASTER OF PUBLIC HEALTH EDUCATION
(DISTANCE LEARNING PROGRAM IN HYBRID MODALITY AND EVENING PROGRAMS)

The Master of Public Health Education Program trains professionals to promote the health of individuals and families through education, behavior modification, and the development of attitudes that result in the protection and maintenance of health.

The program addresses today's health issues through teaching, research, consulting, and community services. The curriculum offers elective courses in areas such as patient education, school health, and human sexuality. The program seeks to promote quality of life and healthy life-styles among the population by means of an interdisciplinary and participatory approach.

Specific Admission Requirements

The applicant should have completed the following number of credits in the subjects specified below:

Required Courses	Credit-Hours
Education (or equivalent as approved by the program)	6
Statistics at biostatistics at undergraduate level	3
Social Sciences (or their equivalent as approved by the program)	6

Graduation Requirements

Students will receive a Master of Public Health Education degree upon meeting the following requirements:

- Completion of the 63 credit hours + 12 hours program (57 in-required courses, and 6 in elective courses).
- Overall grade point average of at least 2.50 and 3.00 in the specialty.

MASTER OF PUBLIC HEALTH EDUCATION CURRICULUM

Total Trimester Credit Hours: 63

SALP 6006	Introduction to Public Health	3
ADSS 6516	Fundamentals of Health Policy and Management in Public Health	4
BIOE 6525	Statistical Analysis	5
CISO 6546	Social Determinants and Equity in Public Health	3
EPID 6523	Epidemiological Methodology	4
EDSA 6573	Assessment and Planning in Health Promotion and Health Education	3
SAAM 6528	Principles of Environmental Public Health	3
EDSA 6250	Applied Research in Health Promotion and Health Education	3
SALP 6251	Leadership in Public Health	2
INTD 6996	Inter-professional Collaborative Practice in Public Health	(12 hours)
EDSA 6401	Perspectives and Contexts of Health Promotion and Health Education	2
EDSA 6476	Social and Behavioral Theories and Models	2
EDSA 6405	Health Communication Programs Design	3
EDSA 6475	Intervention Approaches for Health Promotion and Disease Prevention	3
EDSA 6568	Group Facilitation Skills	3
EDSA 6567	Advocacy, Intersectoriality, and Community Mobilization	3
EDSA 6571	Health Promotion and Health Education Evaluation and Measurement	3
EDSA 6474	Managerial Considerations for Developing and Implementing Health Education Programs	2
EDSA 6997	Integrative Experience in Health Promotion and Health Education	2
EDSA 6996	Supervised Practice in Health Promotion and Health Education	4
Electives		6

MASTER OF SCIENCE IN INDUSTRIAL HYGIENE

The Master of Science in Industrial Hygiene Program trains industrial hygienists to supply the demand for this professional in Puerto Rico. The industrial hygienist deals with the anticipation, recognition, evaluation, and control of occupational health hazards in the workplace and in the community. It is expected that these professionals contribute to the reduction of occupational injuries and illnesses among Puerto Rican workers.

The curriculum in this two-year program includes 18 trimester credit hours in public health, 15 in public health area, 55 in industrial hygiene and related areas.

Specific Admission Requirements

Applicants must have approved the following courses:

Required Courses	Credit-Hours
Biology	6

Chemistry	8
Organic Chemistry	4
Calculus	3
Physics	6

Graduation Requirements

Students will receive a Master of Science in Industrial Hygiene degree upon meeting the following requirements:

- Completion of the 66-credit hour program (all required courses).
- Overall grade point average of at least 2.50 and a 3.00 average in the field of specialty.

MASTER OF SCIENCE IN INDUSTRIAL HYGIENE CURRICULUM

Total Trimester Credit-Hours: 66

SALP 6006	Introduction to Public Health	3
BIOE 6525	Statistical Analysis	5
EPID 6523	Epidemiological Methodology	4
ADSS 6518	Organizational and Administrative Aspects of Occupational Health & Industrial Hygiene Programs	3
SAAM 6512	Physical Hazards Control	3
SAAM 6513	Physical Hazards Laboratory	1
SAAM 6524	Occupational Health Principles	3
SAAM 6526	Principles Industrial Ergonomics	3
SAAM 6528	Principles of Environmental Health	3
SAAM 6543	Industrial Hygiene	3
SAAM 6547	Basic Principles in Occupational Safety	3
SAAM 6548	Industrial Hygiene Laboratory	2
SAAM 6565	Chemical Risks Control	3
SAAM 6566	Field Studies of the Workplace	2
SAAM 6567	Management Tools for Industrial Hygienists	3
SAAM 6568	Laws and Regulations Applied to Occupational Safety	3
SAAM 6570	Response and Preparation for Emergencies and Hazardous Operations	3
SAAM 6571	Research Topics in Occupational Epidemiology and Health	3
SAAM 6572	Design of Controls in Ergonomics	3
SAAM 6573	Chemical Risk Laboratory	1
SAAM 6636	Occupational Toxicology	3
SAAM 6696	Industrial Hygiene Internship	6

MASTER OF HEALTH SCIENCES WITH SPECIALTY IN NUTRITION

The program leading to the Master of Health Sciences with Specialty in Nutrition trains health professionals in the field of public health nutrition. Graduate's plan and implement nutrition programs, conduct research, and teach nutrition at graduate and undergraduate levels.

Program graduates develop skills in the methodology of health services research as it applies to nutrition, and study nutritional problems of the population. Most find employment in public and private teaching institutions, health services agencies, food industry, and pharmaceutical companies.

Specific Admission Requirements

Applicants must have approved the following courses:

Required Courses	Credit-Hours
General Chemistry	5
Organic Chemistry	4
Biochemistry	3
Biology	8
Calculus	4
Social Sciences	6

The Graduate School of Public Health offers numerous courses in the areas of administration, biostatistics, maternal and child health, epidemiology, and social sciences that may be of interest to nutrition students. If interested, students must take those courses as electives in addition to the program outlined below.

Graduation Requirements

Students will receive a Master of Health Sciences with Specialty in Nutrition degree upon meeting the following requirements:

- Completion of the 47-credit-hour program (44 in required courses, and 3 in elective courses).
- Overall grade point average of at least 2.50 and a 3.00 average in the area of specialty.

MASTER OF HEALTH SCIENCES WITH SPECIALTY IN NUTRITION CURRICULUM

Total Trimester Credit-Hours: 47

SALP 6006	Introduction to Public Health	3
BIOE 6525	Statistical Analysis	5
DEMO 6606	Use of SPSS Program and other Scientific Research	4
EPID 6523	Epidemiological Methodology	4
NUTR 6521	Biochemistry and Nutrition I	2
NUTR 6523	Biochemistry and Nutrition II	2
NUTR 6528	Seminar in Public Health Nutrition	2
NUTR 6531	Human Nutrition	3
NUTR 6533	Nutrition in Public Health	3
NUTR 6535	Research Project	6
NUTR 6538	Evaluation of Nutritional Status	3
NUTR 6570	Nutritional Research Methodology	3
NUTR 6555	Quality of Life and Nutrition of Persons Fifty Years and Over	2
NUTR 6560	Planning of Nutrition Program	2
Electives		3

GRADUATE CERTIFICATE IN GERONTOLOGY
(DISTANCE LEARNING PROGRAM IN ONLINE MODALITY AND EVENING PROGRAM)

The Graduate Certificate in Gerontology Program trains professionals from diverse health professions by offering a basic content in gerontology and focusing on the biological, psychological, social, clinical, and administrative aspects related to the aging process. The program is geared to improve the professionals' knowledge, skills, and attitudes for a better understanding of the aging process, and in this way contribute

to an effective service delivery to meet the health needs of the elderly population. The Graduate Certificate in Gerontology has a total of 20 credits, which emphasize a holistic perspective and an interdisciplinary health team approach in the delivery of health services to the elderly population.

Specific Admission Requirements

Applicants must hold at least a bachelor's degree and have completed a total of 3 credits in social sciences, 3 credits in biology, and 3 credits in psychology.

Graduation Requirements

Students will receive a Graduate Certificate in Gerontology upon completion of the 20-trimester credit-hour program.

GRADUATE CERTIFICATE IN GERONTOLOGY CURRICULUM

Total Trimester Credit-Hours: 20

GERO 6005	Introductory Seminar to Gerontology	1
GERO 6501	Biological Aspects of Aging	3
GERO 6503	Psychological Aspects of Aging	3
GERO 6505	Clinical Aspects of Aging	3
GERO 6507	Social Aspects of Aging	3
GERO 6509	Administrative Aspects of Gerontology	3
GERO 6495	Planning the Interdisciplinary Intervention in Gerontology	1
GERO 6511	Interdisciplinary Intervention	3

GRADUATE CERTIFICATE IN DEVELOPMENTAL DISABILITIES EARLY INTERVENTION (EVENING PROGRAM)

The Graduate Certificate in Developmental Disabilities - Early Intervention constitutes an innovative contribution to the academic offerings of the Medical Sciences Campus in a high priority area.

The curriculum has an interdisciplinary and transdisciplinary approach to intervention, with emphasis on prevention, rehabilitation, and family participation. It also has a strong component of hands-on experiences with a significant number of hours devoted to field experiences in programs servicing children 0 to 5 years of age who present developmental delay or who are at risk.

The program is open to professionals in the areas of health education, occupational therapy, physical therapy, speech and language pathology, audiology, special education, psychology, and social work who are currently working with children 0 to 5 years old with developmental disabilities or delay.

The program's interdisciplinary and transdisciplinary approach is achieved through curricular design, by faculty from various fields, a heterogeneous group of students, and varied field experiences. This is three trimesters and one summer program in which students are expected to complete 22 credits in core courses and four (4) credits in an area of interest (service coordination, public policy, or clinical intervention).

Specific Admission Requirements

In order to be admitted to the program, the candidates will be evaluated according to the following:

- Professional background in the fields of health, education, psychology, social work, or administration.
- License to practice a profession, when appropriate.
- Work experience (over one year).

Graduation Requirements

Students will receive a Graduate Certificate in Developmental Disabilities - Early Intervention upon meeting the following requirements:

- A grade point average of at least 3.00.
- Approval of 26 credits as indicated.
- Completion of practicum activities.

GRADUATE CERTIFICATE IN DEVELOPMENTAL DISABILITIES EARLY INTERVENTION CURRICULUM

Total Trimester Credit Hours: 26

DDIT 6505	Introduction to Public Health and Developmental Disabilities	3
DDIT 6506	Typical and Atypical Child Development from 0 to 5 Years	3
DDIT 6507	Assistance to Families with Children with Special Needs	3
DDIT 6508	Assessment of Infants and Pre-Schoolers with Developmental Disabilities	3
DDIT 6509	Community Service Delivery in Early Intervention	3
DDIT 6510	Planning, Implementation, and Evaluation of Developmental Disabilities - Early Intervention Programs	3
DDIT 6545	Interdisciplinary Practicum in Developmental Disabilities-Early Intervention	4

One (1) elective course must be selected from these options:

DDIT 6537	Service Coordination	4
DDIT 6539	Legislation and Public Police in the Developmental Disabilities - Early Intervention Area	4
DDIT 6535	Seminar in the Management of Conditions and Specific Risks	4

DOCTOR IN PUBLIC HEALTH WITH SPECIALTY IN ENVIRONMENTAL HEALTH

The Doctor in Public Health (DrPH) with a specialty in Environmental Health develops through its curriculum, the knowledge and skills required to analyze and assess environmental health problems and risks at the community level. This DrPH Program prepares future public health leaders by broadening their applied sciences skills in order to offer solutions to environmental health problems and exercise professional leadership in the area of community health. The DrPH with a specialty in Environmental Health provides advanced level training in decision-making analysis, leadership, and applied public health research to address and reduce environmental health problems and risks. The environmental health specialty stresses the study of environmental factors (including biological, physical and chemical) that affect the health of the community. This program prepares public health professionals for Puerto Rico and other countries to occupy upper management and leadership positions, to work in policy making, and to act as consultants in the analysis and evaluation of environmental health problems and risks.

Admission Requirements

Applicants must meet the following requirements:

- Submit an application form, including the following documents: Official transcript of graduate studies and *Curriculum Vitae;* Evidence of professional experience for the past five (5) years of employment issued by the Human Resources Department of the employer and the immediate supervisor; Three (3) letters of recommendation (One of the three letters must be from a professor in the applicant's master's program who is able to comment on the applicant's qualifications to undertake doctoral studies).
- A written essay, on the day of the interview, using a word processor. The format for this written component of the evaluation may vary.
- Applicants must have approved at least a graduate level introductory course in Environmental Health with at least a grade of "B".
- Computer literacy in MS Word, MS Excel, MS Power Point, and at least one statistical software package such as SPSS, STATA, EPI-INFO, SYSTAT or SAS is highly recommended.

Graduation Requirements

In order to be eligible for the degree, students must meet the following requirements:

- Completion of the 55 credit hours (52 in required courses, and 3 in elective courses) with a minimum grade point average of 3.00 (on a scale of 4.00) and remain in good academic standing consistent with the Graduate School of Public Health policies.
- Specialty grade point average of at least 3.00 (on a scale of 4.00).
- Successfully complete a written comprehensive qualifying examination.
- Successfully complete an oral defense of proposal for a dissertation project.
- Successfully complete and defend a dissertation project.
- Complete the 200 hours practicum experience successfully.
- Complete all requirements within an eight-year period.

DOCTOR IN PUBLIC HEALTH WITH SPECIALTY IN ENVIRONMENTAL HEALTH CURRICULUM

Total Trimester Credit-Hours: 55 and 200 Hours of Practice Experience*

BIOE 8005	Advance Methods in Biostatistics	3
EPID 8002	Advanced Methods in Epidemiology	3
CISO 8005	Culture, Social Inequity, and Community Health	3
ADSS 8011	Health Systems and Policy	3
SAAM 8027	Environmental Public Health of Urban Communities	2
ADSS 8105	Applied Public Health Leadership Seminar	2
SALP 8106	Research Design Approaches For Public Health	3
SALP 8026	Public Health Leader as Educator	3
SALP 8005	Health Promotion Seminar	2
ADSS 8008	Health Systems Planning and Strategic Management	3
SAAM 8120	Changing Climate: A Public Health Response	3
SAAM 8119	Exposure Assessment for Environmental Public Health	2
SAAM 8118	Prevention and Control of Environmental Hazards: A system thinking approach	3
SAAM 8017	Health Risk Assessment	3

SAAM 8015	Global Changes, Health, and International Law	3
SAAM 8016	Environmental Policy and Management	3
SAAM 8995	Environmental Health Doctoral Research Seminar I	1
SAAM 8996	Environmental Health Doctoral Research Seminar II	1
SALP 8006	Doctoral Applied Practice Experience in Public Health	200 hrs
SAAM 8198	Dissertation Proposal in Environmental Health	3
SAAM 8199	Doctoral Dissertation in Environmental Health	3
Electives		3

*All doctoral courses must be approved with A or B.

DOCTOR IN PUBLIC HEALTH WITH SPECIALTY IN HEALTH SYSTEMS ANALYSIS AND MANAGEMENT

The Doctor in Public Health represents advanced competency training in public health practice skills, differentiating it from the MPH. The DrPH in Health Systems Analysis and Management incorporate through its curriculum the knowledge and skills needed to facilitate the analysis and evaluation for evidence-based decisions in the public health systems among its students. The DrPH program prepares future public health leaders capable of influencing policies, programs, and institutions through their knowledge, skills and attitudes in health systems in order to maximize public health.

The doctoral program in Public Health with a specialty in HSAM provides advanced level training in decision-making analysis leadership, and applied public health research for the improvement of health systems in order to enhance public health. It is focused on understanding and learning to apply advanced knowledge and skills to complex and real-world problems in the public health field in general, and health systems and services, to assure that public health systems are capable of performing essential functions. The Program prepares public health professionals for PR, the US and other countries with the competencies to perform as advisors, consultants, and any other position that deals with analysis, design, planning, development, management, and improvement of health systems.

Specific Specialty Admission Requirements

- Applicants interested in the Health Systems Analysis and Management specialty must have completed the following requisite courses at the graduate level, prior to admission to the DrPH: (1) precalculus or equivalent, (2) finances, (3) statistical inference or equivalent, and (4) economics; each requisite course with a passing grade of at least a “B”.
- Applicants interested in the Health Systems Analysis and Management specialty must have completed the precalculus or equivalent at undergraduate level with a passing grade of at least a “B”.
- Computer literacy in MS Word, MS Excel, MS Power Point, and at least one statistical software package such as SPSS, STATA, EPI-INFO, SYSTAT or SAS is highly recommended.
- Write an essay using a word processor the day of the oral interview.

Graduation Requirements

Students must maintain a minimum grade point average of 3.00 (on scale of 4.00) to remain in the Program. To qualify for graduation, doctoral students must fulfill the following requirements:

- Complete the Dr PH degree in a maximum period of 8 years of study.

- Completion of the 57 credit hours (54 in required courses, and 3 in elective courses) with a minimum grade point average of 3.00 (on a scale of 4.00) and remain in good academic standing consistent with the Graduate School of Public Health policies.
- Specialty grade point average of at least 3.00 (on a scale of 4.00).
- Successfully complete a written comprehensive qualifying examination.
- Successfully complete an oral defense of proposal for a dissertation project.
- Successfully complete and defend a dissertation project.
- Complete the 200 hours practicum experience successfully.

DOCTOR IN PUBLIC HEALTH WITH SPECIALTY IN HEALTH SYSTEMS ANALYSIS AND MANAGEMENT CURRICULUM

Total Trimester Credit-Hours: 57 and 200 Hours of Practicum Experience*

BIOE 8005	Advanced Methods in Biostatistics	3
EPID 8002	Advanced Methods in Epidemiology	3
CISO 8005	Culture, Social Inequity, and Community Health	3
ADSS 8011	Health Systems and Policy	3
SAAM 8027	Environmental Public Health of Urban Communities	2
ADSS 8105	Applied Public Health Leadership Seminar	2
SALP 8106	Research Design Approaches for Public Health	3
SALP 8026	Public Health Leader as Educator	3
SALP 8005	Health Promotion Seminar	2
ADSS 8008	Health Systems Planning and Strategic Management	3
ADSS 8007	Health Policy	3
ADSS 8010	Organizational Development and Change in Health Service Organizations	3
ADSS 8006	Health Law	3
ADSS 8206	Economic Analysis for Health Systems Management in Health Systems	3
ADSS 8009	Measurement of Quality and Outcomes in Health Systems	2
ADSS 8307	Health Services Evaluation	2
ADSS 8205	Financial Management in Health Systems	3
ADSS 8305	Health Services Research	2
SALP 8006	Doctoral Applied Practice Experience in Public Health	200 hrs
ADSS 8306	Dissertation Proposal in Health Systems Analysis and Management	3
ADSS 8401	Doctoral Dissertation in Health Systems Analysis and Management	3
Electives		3

*All doctoral courses must be approved with A or B.

DOCTOR IN PUBLIC HEALTH WITH SPECIALTY IN SOCIAL DETERMINANTS OF HEALTH

The Doctor in Public Health (DrPH) with specialty in Social Determinants of Health is a graduate program with a duration of four (4) years which has as core the five disciplines of public health (Biostatistics, Epidemiology, Social Sciences/Behavior, Environmental Health and Health Services Administration), were the content and practice of public health guide the determinants of health. Its curricular content is targeted specifically to study inequities and inequality within the social determinants of health. This program directs its focus of attention to the study of social conditions related to where people live and work; therefore, it is framed in the core area of public health that has to do with the Social Sciences and behavior.

Specific Specialty Admission Requirements

- Submit an updated Curriculum Vitae
- Submit three (3) letters of recommendation, one of which should be from the master's thesis advisor. If the thesis advisor is not available, the applicant must submit contact information of two professors who can comment on the applicant's qualifications for graduate studies.
- Write a 5–7-pages essay describing his/her interest in social determinants of health; his/her experience in advocacy, research, teaching, and service in the promotion and protection of public health; and what kind of in-depth project he/she wishes to develop if admitted to the specialty.
- Applicants will be required to perform other tasks on the day of the interview, such as reading and writing a professional article or essay as part of the admission process.
- Approve a course in statistical inference prior to admission to the doctoral program.

Graduation Requirements

Students must maintain a minimum grade point average of 3.00 (on a scale of 4.00) to remain in the Program. To qualify for graduation, doctoral students must fulfill the following requirements:

- Complete the Dr PH degree in a maximum period of 8 years of study.
- Completion of the 57 credit hours (51 in required courses, and 6 in elective courses) with a minimum grade point average of 3.00 (on a scale of 4.00) and remain in good academic standing consistent with the Graduate School of Public Health policies.
- Specialty grade point average of at least 3.00 (on a scale of 4.00).
- Successfully complete a written comprehensive qualifying examination.
- Successfully complete an oral defense of proposal for a dissertation project.
- Successfully complete and defend a dissertation project.
- Complete the 200 hours practicum experience successfully.

DOCTOR IN PUBLIC HEALTH WITH SPECIALTY IN SOCIAL DETERMINANTS OF HEALTH CURRICULUM

Total Trimester Credit-Hours: 57 and 200 Hours of Practicum Experience*

BIOE 8005	Advanced Methods in Biostatistics	3
EPID 8002	Advanced Methods in Epidemiology	3
CISO 8005	Culture, Social Inequity, and Community Health	3
ADSS 8011	Health Systems and Policy	3
SAAM 8027	Environmental Public Health of Urban Communities	2
ADSS 8105	Applied Public Health Leadership Seminar	2
SALP 8106	Research Design Approaches for Public Health	3
SALP 8026	Public Health Leader as Educator	3
SALP 8005	Health Promotion Seminar	2
ADSS 8008	Health Systems Planning and Strategic Management	3
DESS 8011	Social Determinants of Health Graduate Seminar I	1
DESS 8012	Social Determinants of Health Graduate Seminar II	2
DESS 8105	Social Theory and Public Health	3
DESS 8201	Qualitative Methods in Social Determinants of Health	3
DESS 8202	Statistical Measurement and Argumentation in Social Determinants of Health	3
DESS 8206	Community Building and Action on the Social Determinants of Health	3
DESS 8208	Political Economy of Health	3
DESS 8305	Health and Social Policy Analysis	3

SALP 8006	Doctoral Applied Practice Experience in Public Health	200 hrs
DESS 8198	Dissertation Proposal in Social Determinants of Health	3
DESS 8199	Doctoral Dissertation in Social Determinants of Health	3
Electives		6

*All doctoral courses must be approved with A or B.

PROFESSIONAL STUDIES CERTIFICATION IN MATERNAL AND CHILD HEALTH (ONLINE)

The Professional Studies Certification in Maternal and Child Health prepares professionals with leadership capacity, able to analyze the determinants of the health in order to articulate a system of care based in mothers and children. The students will increase new knowledge of maternal and child health care through applied research, intercession, continuing education, the provision of technical assistance, professional advice, and information dissemination. This offer of professional studies is completely online thus allowing maximum comfort and convenience for the interested student. The curriculum is based on leadership competencies in Mother and Child Health.

The curriculum of the program includes 17 trimester credit hours in 3 trimesters with a total duration of one academic year. These will include 5 core courses in maternal and child health and one elective. The student has a minimum of one and a maximum of 3 years to complete the professional studies program.

Specific Admissions Requirements

1. Possess a baccalaureate degree or its equivalent in other countries, of a university certified as an institution of higher education with a recommended general average of 2.85 or more (of a maximum scale of 4.00).
2. Have approved a course of three credits of algebra and a course of statistics or biostatistics at university level.
3. You must have mastery of the use of your computer and be familiar with the use of basic personal computer applications.
4. Broadband internet access at home or work.

Graduation Requirements

Students will receive a Professional Studies Certification in Maternal and Child Health upon meeting the following requirements:

- Completion of the 17 trimester credit hours in required courses with a minimum of A or B.
- Overall GPA of minimum 3.0 after completion of courses and assessment strategies.

PROFESSIONAL STUDIES CERTIFICATION IN MATERNAL AND CHILD HEALTH CURRICULUM

Total Trimester Credit Hours: 17

SALP 6601	Fundamentals of Maternal and Child Health	3
SALP 6602	Reproductive Health	3
SALP 6606	Seminar of Maternal and Child Health	2
SALP 6604	Bioethical Aspects of Maternal and Child Health	3
SALP 6603	Public Policy and Advocacy for Women, Children and Families	3
Elective		3

COURSE DESCRIPTIONS

ADSS 6490 - Strategic Management for Health Services Organization. Three (3) credits. Pre-requisite: ADSS 6525.
This course is designed to develop a comprehensive understanding of strategic planning for health care organizations based on theory, models and methods in the health care planning and administration field. The course is targeted for Master in Health Services Administration students who will become competent at applying systemic thinking in conceptualizing strategic problems and issues, performing environmental scanning, formulating organizational mission, vision, goals and objectives, evaluating strategic and marketing options, implementing operational plans and monitoring and evaluating strategic actions. Teaching strategies include case study analysis, examinations, strategic plan oral presentations and report writing and class participation.

ADSS 6505 - Quantitative Decision Analysis. Four (4) credits. Pre-requisite: BIOE 6525.
This course introduces the student to the methods of operations research and its role in the decision making process, some topics to be covered will be: queueing theory, decisions under risk and uncertainty, decision trees, projection methods, break even and inventory analysis.

ADSS 6508 - Written and Oral Communication. One (1) credit.
Course designed for the preparation of minute, memorandum, reports, bulletins, written messages, and the different types of oral communication through analysis, discussion, and practice exercises.

ADSS 6510 - Seminar on Supervision. Four (4) credits.
This course provides the learning experiences necessary to guide the student in the development and clear understanding of the supervisor's role. The course emphasizes the development of skills necessary for supervision, such as: communication, delegation, and leadership. Different educational skills are used, giving emphasis to practical exercises and case studies.

ADSS 6516 - Fundamentals of Health Policy and Management in Public Health. Four (4) credits.
This course introduces the fundamentals of program management, leadership, and organizational dynamics. It includes understanding the role of the manager; the importance of leadership; the structure and function of organizations; selected human resources issues; and managerial skills, such as communication, problem solving, decision making, team building, and power and influence. Since the manager is critical to the organization's success, students learn how to define and measure program performance, develop plan and deal with human resources issues. Using case studies and group exercises, students are expected to demonstrate effective group management and analyzed typical management scenarios.

ADSS 6525 - Introduction to Healthcare Management. Three (3) credits.
The purpose of this course is to provide the student with a conceptual and applied vision of the organization theories and the inherent administrative processes to the field of the Administration of Health Services. Likewise, the impact in the dynamics of the health sector and the impact on the administration of the system of health care services. The administrative process is presented from a theoretical/practical perspective, considering that the essential of a certain system of health constitutes the group of services that you provide and how these services satisfy the necessities and the population's demand to serve. The objective of the course will be achieved through a series of lectures, case studies, presentations and selected readings. At the end of this course, the student will review the major aspects of management and the skills necessary to be successful as an executive in the healthcare system.

ADSS 6535 - Continuous Quality Improvement in Health Services Organizations. Three (3) credits. Pre-requisite: ADSS 6525.
The course is designed to provide the Health Services Administration students with a conceptual framework of the continuous quality improvement movement and its application to healthcare. It examines The Philosophy of Continuous Quality Improvement (CQI) and Total Quality Management (TQM) and provides guidelines for its implementation in healthcare organizations. There are four prime components to the course: 1) Concepts, principles and theory driving the quality movement since these serve as the theoretical bases for quality requirements in health care, 2) Techniques commonly used in quality programs and strategies for its implementation through reading, discussion, and through a final project, 3) Some of the more common quality measurements used by regulatory, accrediting, or their institutions, 4) Correlation between quality and cost in healthcare.

ADSS 6548 - Hospital Administration. Three (3) credits. Pre-requisites: ADSS 6525.
Basic concepts of hospital administration, focusing the hospital as a prototype of a complex organization, with multiple and diverse objectives. The hospital is presented as an open system, capable of solving problems related to its internal and external analyze environment. The organizational structure analyze its processes and the necessary behavior to solve the problems of the hospital organization with efficiency and effectiveness.

ADSS 6549 - Problems in Hospital Administration. One to three (1-3) credit(s).
Mayor problems as well as typical situations of hospital administration are reviewed. Basic concepts are then applied using methodology and simulation models to provide the student a practical experience using updated management knowledge and techniques.

ADSS 6550 - Introduction to Health Care Management. Zero (0) credit.
The student will acquaint himself with general field of administration and in addition, according to the individual students' interest, he will be able to intensify his knowledge in any one of the following subtopics: Health Financing, Health Care Organization or Quality, and Patterns of Health Care Utilization.

ADSS 6551 - Legal Aspects in Medicine. Six and a half (6.5) credits.
This course provides the medical student an opportunity to learn the laws and jurisprudence which affects the practice of medicine as well as to learn the importance of informed consent and new medico legal trends in medicine such as abortion, family planning, euthanasia, etc.

ADSS 6555 - Legislative Process for Health Professionals. Three (3) credits.
This course introduces students to legislative process of Puerto Rico and United States as it is state in both Constitutions. Students will develop skills to analyze and evaluate health legislation addressing public health needs and determinants of health at local and federal level. Ethical issues will be addressed within each of the topics discussed. Through the use of diverse resources such as information in web sites of the Puerto Rico Legislative Services Office and the United State Congress, visits to the Puerto Rico Legislature public hearings, examine evidence base reports and articles, student will research about public health legislation. After completing this course, the student will be able to work on draft papers or legal report related to actual public health issues important in the island that improve the health and welfare of the population.

ADSS 6568 - Special Projects. Three (3) credits.
Discussion of administrative problems in the field of Public Health. Emphasis is given to hospital problems.

ADSS 6571 - Budgeting Theories and Practices. Three (3) credits. Pre-requisite: SALP 6006.
Modern budgeting concepts as instruments for the planning and programming of private and public activities in the health sector. Budgeting theories are studied and applied to the practice of designing and administering a budget.

ADSS 6576 - Comparative Health Systems. Three (3) credits.
Health system in our contemporary state as basic source of comparison and study. Analysis of the ecology of the sector with special emphasis in the relation of bureaucratic models, political, and economic systems. The course includes the study of bureaucratic and political models in development stage, with special attention given to the role of health administration in the promotion and development of emergent health systems.

ADSS 6579 - Organizational Behavior. Three (3) credits. Pre-requisites: ADSS 6525.
The course is designed for students in the Program of Health Services Administration. This course examines the nature and dynamics of organizational behavior affecting the health services administrator and other individuals. Aims to students' awareness of their own behavior and how it can affect their work within health service organizations. Behavioral patterns, organizational design, organizational development and assessment are studied in order to guide students in the decision-making process within health organizations and their role as health services administrators. At the end of the course, the students will evaluate the importance of individuals' characteristics of the members of the organizations and the impact in the performance of the organizations in the healthcare sector. The instructional mode includes lectures, case discussion, oral presentations and web interactions.

ADSS 6580 - Health and Development. Three (3) credits.
Structural innovations in the health sector facing the changing needs and opportunities of developing countries. It Is based on the assumption that in a society with accelerated social change innovation goes further than the mere satisfaction of the additive growth of the society. To preserve its relevance the health sector must keep open the real innovative change. The economic and social structural change that occurs in the development process and the effect of this process on the health of the population is discussed.

ADSS 6581 - Labor Relations. Two to three (2-3) credits.
Comprehensive overview of the nature, origin, development, and dynamics of the labor movement, the important legal aspects and regulations that govern the labor relations; the structures and processes to channel those of unions and employers to deal in each one of those stages with special emphasis on the aspects of collective bargaining.

ADSS 6582 - Personnel Administration. Two to three (2-3) credits.
Manpower development and direction are viewed as the focal point of personnel administration. Personnel administration concepts are correlated with general administration generally in order to have a complete overview of the personnel administration spectrum.

ADSS 6583 - Legal Aspects in Health Services. Three (3) credits. Pre-requisites: ADSS 6525.
This course is designed to provide a thorough insight of the ever-expanding interface between the law and health services administration in the civil and administrative realms focusing in risk management to the health service administration students. The course familiarizes the student with the application of legislation and regulations both in the commonwealth as well as the federal scenario. Lectures will be held covering those topics of major relevance and interest to the practice of health care services. Ethical issues will be attended as part of every topic discussed in class. At the end of the course, the student will be able to interpret the basic legal principle affecting how healthcare services operate upon health policy issues.

ADSS 6584 - Health Politics and Policy. Three (3) credits. Pre-requisites: SALP 6006.
This course is designed to introduce students to health care policy and its impact on the organization, financing and delivery of health services. The students will examine the role of major actors and institutions, including government, providers, consumers and insurers, as well as professional societies, in shaping and influencing health policy. Topics are presented from the perspective of the health care environment of Puerto Rico and the united states employing a comparative approach. The policy decision process at different levels will be discussed using political, social and economic frameworks. Through interactive lectures, documentaries and group discussions, students learn specific policy issues that are currently being debated and are of major relevance in the health care environment.

ADSS 6585 - Health Economics. Three (3) credits. Pre-requisite: ADSS 6525.
This course has the main purpose of providing the student with analytical tools of economic theory to better understand the economic forces shaping the health care sector. Emphasis is given to issues related to demand, and supply of health services cost containment measures, the role of health insurance, provider reimbursement and theories regarding health care cost inflation.

ADSS 6586 - Health Care Delivery Systems. Three (3) credits. Pre-requisite: ADSS 6525.
This course has as purpose to carry out a critical analysis of the different systems and models of health services delivery, particularly in Puerto Rico and in the United States. It discusses the organizations of government and private health services from a historical perspective and the same one is compared with the current state of these systems, especially by the light of the Healthcare Reform of Puerto Rico and the United States. Also analyzes, these systems of health in function of generally accepted approaches of accessibility, quality, effectiveness, efficiency and integrity. The course is designed for students in the Program of Health Services Administration. At the end of the course the students acquire a critical knowledge of the health systems for analysis and evaluation considering the application of the conceptual models. The instructional mode includes lectures, case discussion, oral presentations and team work experiences.

ADSS 6587 - Health Systems II. Two (2) credits. Pre-requisite: ADSS 6586.
Students spend most of the time in a health institution, service or program to become acquainted with its day-to-day operation. May be considered a pre-residency, a bridge between the theoretical framework and the intensive work experience to be provided in the residency.

ADSS 6589 - Bioethics in Healthcare Management. One (1) credit. Pre-requisite: ADSS 6583.
The purpose of this course is to provide the student a framework for addressing bioethical issues in business, medicine and health care delivery with emphasis on the role of the manager. The course approaches bioethical issues in health care from societal, institutional and individual, and clinical perspectives. To achieve the objectives of the course the student will analyze case studies from the medical, scientific, moral and socioeconomic bases and examine the decision processed involved. Students will be encouraged to use the available institutional resources in bioethics, located at The Medical Library of The Medical Sciences Campus. There will be case studies discussion, guest lectures, and final, short-essay exam designed to explore the concepts.

ADSS 6590 - Administrative Aspects in Laboratory Clinics. Two (2) credits.
Health Services Administration Theory is presented to provide student with basic fundamentals of administrative aspects of health care. Particular administrative aspects of laboratory clinics are viewed, including systems theory, quality assurance, legal aspects, and the administrative process in general.

ADSS 6591 - Quantitative Decision-Making for Health Services Administration I. Four (4) credits.
This course introduces Health Services Administration graduate students to statistical methods for decision making. Topics covered will be Operation Research, Break-Even Analysis, Probability Theory, Random

Variables, Cybernetic and Statistical Process Control, Inventory Analysis, and Sampling. The applications will be on the management and control of health services. A user-friendly statistical program will be used for all calculations and estimations in order to emphasize intuitive reasoning. Students will have opportunity to work in teams.

ADSS 6592 - Quantitative Decision-Making for Health Services Administration II. Four (4) credits. Pre-requisite: ADSS 6591 or BIOE 6525.
Statistical inference applied to the Health Services Administration; operation research methods like queueing theory and linear programming will be introduced. Emphasis is on application using microcomputer software programs.

ADSS 6593 - Capstone Seminar. Three (3) credits. Pre-requisites: All the required courses for the master degree up to the First Trimester of the Second Year of Studies.
This course is designed to integrate the coursework covered in previous trimesters. The course enables students to build linkages areas of study and provides a setting for testing their own level of knowledge and analytical skills, as well as identifying the need for tutoring and advising in specific areas. The case method is used as the primary teaching tool with guidelines for completing the assignments. Grading System: Passed (P), Not Passed (NP)

ADSS 6594 - Public Health Program Planning and Evaluation. Four (4) credits. Pre-requisites: ADSS 6525, ADSS 6516, SALP 6006.

Through this course, students will be able to understand how to design and implement public health programs. Likewise, they will apply their knowledge and skills to evaluate the effectiveness of the program outlined. Interactive lectures, discussion forums, applied exercises, and others will be used to examine planning theories, concepts, models and techniques, which are essential for public services management. Through synchronous or asynchronous sessions, emphasis will be placed on the assessment of community needs as the basis of the public health planning process, considered as a dynamic and continuous process aimed at the development of programs and projects in communities or organizations. At the end of the course, students will demonstrate the knowledge acquired and skills necessary to design and evaluate a public health program. The course will be offered in in-person or hybrid modality.

ADSS 6595 - Mental Health Care Utilization. Three (3) credits.
Different conceptualizations about mental health and their prevention are discussed. Specifically, we analyze different mental health problems prevalent in our society. The need for preventive programs and factors that facilitate or impede the utilization of available services are examined.

ADSS 6597 - Administrative Residency. Zero (0) credits. Pre-requisites: All the required courses of the Health Services Administration.
The course is a coordinated planned full-time field practicum, designed to integrate competencies to real world scenarios in the healthcare industry. In 800 hours conducted during daytime work hours fulltime, students attend an individually designed program in healthcare facilities where they are expected to become immersed in their daily operation and management. Total hours are divided into two programmed experiences. First part consists of a minimum of 200 hours in the summer session of the first academic year. Residents may rotate in different ambulatory care facilities, insurance companies, consulting firms and other healthcare related organizations. Second part consists of the remaining 600 required hours during the third trimester of the second academic year. In this part, students must complete **a minimum of 267 hours (33%)** in a general hospital. Participation in health service administration special trainings can be accredited toward residency hours. A preceptor will supervise the resident.

ADSS 6598 - Information Systems in Health Services Administration. Three (3) credits. Pre-requisites: ADSS 6525.
Basic concepts required to design and operate an information system.

ADSS 6600 - Management of Healthcare Organizations. Three (3) credits. Pre-requisites: ADSS 6525.
This course is designed to serve as an integrative experience of the managerial decision-making process, as viewed through different management-oriented courses of the Health Services Administration Curriculum. The course follows a lecture and discussion format in which the student is confronted with the managerial decision-making process in real world situations, brought by invited speakers. This experience is further strengthened by site visits to selected organizations that serve as a direct observation experience for the topic areas: Organized Integrated Delivery Systems; The Role of Managed Care in Different Reform Proposals; Issues of Health Care Financing, and Leadership Through Human, Capital and Information Resources Management.

ADSS 6606 - Capstone Seminar in Health Services Administration. Three (3) credits. Pre-requisites: All the required courses except ADSS 6610, ADSS 6609, ADSS 6535.
The Capstone Seminar in Health Services Administration is designed to provide the Health Services Administration student an integrative learning experience in the final trimester of the on-Campus academic experience. The course enables students to build linkages between the different curriculum content areas, by testing their level of knowledge and analytical skills through seminar and research as the main instructional strategies. Thorough the course students will apply team-effectiveness skills during the analysis of knowledge content areas, professional competencies, and research production.

ADSS 6607 - Health Care Cost Accounting. Three (3) credits. Pre-requisites: ADSS 6585, ADSS 6516. Co-requisite: ADSS 6586.
This course provides the student enrolled in the Health Services Administration Program the necessary analytical tools to determine the cost of the different components that intervene in the delivery of health services. The student will acquire skills in determining the human, technical, and capital resources that comprise the production of health services. These skills are of special importance in the new health care scenario, in which resources are limited, and managed care arrangements rely heavily cost data to meet extensive demands for multiple health priorities. The course will be taught through lectures and discussion.

ADSS 6609 - Health Care Financial Management. Three (3) credits. Pre-requisites: ADSS 6607.
This course is designed to develop health care financial management competencies in the Health Services Administration student, to be applied in different health care settings. The course focuses specifically on investment and financing decisions in the health care corporate and institutional levels. The course includes topics in Capital Budgeting, Uses of Capital Financing, Evaluation of Investment Projects, Financial Reporting and Statement Analysis, Rate-Setting and Negotiation, and The Effect of Managed Care on Financial Management. The course will be offered principally through lectures and class discussions.

ADSS 6610 - Principles of Health Insurance and Managed Care. Three (3) credits. Pre-requisites: ADSS 6525.
The course is designed for students seeking a working knowledge of Health Insurance and Managed Care at a time when The United States and Puerto Rico are facing a major Health Care Reform. Students will acquire a working knowledge of managed care concepts as it relates to the Puerto Rico and United States health insurance industry. Upon the completion of the course, students will be able to apply the concepts of Managed Care to their work environment and evaluate the performance and outcomes of health care organizations.

ADSS 6620 - Advanced Public Health Policy Analysis. Three (3) credits. Pre-requisites: ADSS 6584.
Through this course, students will develop critical analysis skills to formulate, implement and evaluate health policies and programs at the organizational and system level. Interactive lectures, group discussions and case studies will be used to analyze and evaluate the legislation and regulation processes of current health reforms of local and federal agencies from the perspective of Puerto Rico and the united stated health policies. Students will be able to analyze the evidence for policy interventions, write briefs for proposed legislation, give testimony to inform policy decisions, and analyze the ethical challenges in policy analysis. Students will demonstrate practical skills in policy analysis and advocacy to change public health polices, considering the creation of a promotion strategy that involves the media, the community, and other organizations.

ADSS 6621 - Financial Resources Management for Public Health Organizations. Three (3) credits.
This course introduces the basic concepts of budgeting and fiscal management in public health organizations. The student will be introduced to the planning program budgets and the management of income and expenditure, through responsible implementation of policies, practices and decisions, in order to achieve unit objectives effectively and efficiently in public health organizations. Using interactive lecture and group discussions students will employ budgeting and fiscal management techniques in order to develop decision-making skills that will result in sustainable public health organizations. Case studies will be used to practice these techniques, emphasizing budgeting and financial skills. Students will be able to apply financial basic concepts in public health management scenarios.

ADSS 6625 - Human Resources Management. Four (4) credits. Pre-requisite: ADSS 6525.
The course is designed for students undergoing graduate-level training to assume executive positions in the health care field. The course provides the student the opportunity to become familiarized with the managerial and labor legislation activities in the field of Human Resources Management and Labor Relations, and emphasizes the application of concepts and methods from this field to the healthcare scenario. It also has the purpose of generating Interpersonal and organizational skills that are critical to Human Resources Management. The course is organized in four (4) areas: 1) Concepts, Scope, and Approach to Human Resources Management, 2) Methods, Roles, and Activities in Human Resources Management, 3) The Dynamic Nature of the Labor Relations, 4) Interpersonal and Organizational Skills. The teaching methodology includes lectures, group discussions, student presentations, and practice exercises.

ADSS 6705 - Applied Research Seminar. Three (3) credits. Pre-requisites: All the required courses for the master degree except ADSS 6597. Co-requisite: ADSS 6597.
The Applied Research Seminar is a practicum investigation, focusing on particular issues and situations impacting managerial decision making in health services organizations. Students work closely with a faculty member and the residency preceptor in formulating and implementing the study. This course provides the students with the opportunity to apply the managerial skills obtained in previous courses to a research problem in their residency setting; In turn health organizations benefit from the outcomes of the research process.

ADSS 8005 - Organizational and Administrative Elements of Health Services. Three (3) credits.
This course provides a comprehensive introduction to theories and applications of organization and management in the Public Health field. The student will acquire skills that are necessary to operate effectively in normative positions at health agencies, institutions, and programs. The course focuses on subject matter related to Management, Budgeting Strategic Planning, Public Policy Making, and Community Participation. It also addresses current regulation in the health field, the design and evaluation of programs, and the monitoring of the quality of services. The course is presented mainly in a lecture format, and is augmented with case studies and guest lectures related to current health conditions in Puerto Rico.

ADSS 8006 - Health Law. Three (3) credits.
This course provides the practical knowledge to identify legal issues and to understand the legal ramifications of strategic decisions and the role of legal systems in health policy and health care systems. An overview of the PR and the US legal systems, population health and public health, access to health care, diverse regulations in the areas of contracts, Medicare and Medicaid issues, non-discrimination, quality of care, conflict of interest, and PPACA versus AHA will be discussed. Other topics such as reproduction, birth and life and death decisions, and ethics will be discussed. Learning activities include interactive lectures, case studies and class discussion, and a written exam. Lastly, students will discuss the components of the health care system within a legal framework that will contribute to the decision-making process as health professionals.

ADSS 8007 - Health Policy. Three (3) credits. Pre-requisites: ADSS 8005.
This course is designed to provide students with the competencies to understand health policy in the health sector. The course provides a dual approach to understanding the role of government leadership in formulating and implementing public health policy and the participation of relevant community, institutional and professional actors in shaping the direction and implementation of policy, through the design, financing, and delivery of health services. Through lectures, group discussions and real-life case discussions, students will examine and discuss relevant literature in the health policy field, specifically, and health services and public health fields, in general. The course provides an applied approach to the examination of policy options through a policy memo, emphasizing policy decision making under time constraints; and a policy paper designed to compare major health system reform initiatives. It emphasizes the consumption of the results of applied research to enable evidence-based policy decisions.

ADSS 8008 - Health Systems Planning and Strategic Management. Three (3) credits. Pre-requisites: ADSS 8011.
This course is targeted to doctoral students. The course comprehensively examines health systems planning, strategic planning and management related to health care organizations at the global, regional, national and local service levels. The course content builds upon the fundamental models and methods of planning and management, with special attention paid to the problems and challenges specific to the health care industry from a systemic and strategic analysis standpoint. Emphasis is given to strategic thinking and analysis, environmental analysis, strategy formulation analysis and evaluation of alternatives and strategic choice. In-depth emphasis is also given to scenario construction and planning models and to strategy identification, evaluation and selection as applied to public health and private sector issues. Planning models and principles will be applied to public health and private sector issues.

ADSS 8009 - Quality Management and Outcomes in Health Systems. Three (3) credits.
This course introduces students the main concepts associated with health systems quality and outcomes measurement, highlighting the relevance, measurement, availability and development issues of health systems performance indicators. It describes examples of the most common indicators to assess health system performance in terms of achieving the health and well-being of the population by endorsing equitable healthcare. Students will be able to be familiar with, explain, and be able to appraise the quality and outcomes of a health system or of one of its components. Instructional strategies will be interactive lectures, journal club discussion and independent study. At the end of course, students will demonstrate their ability to identify and discuss the status of the health system's quality and outcomes in relation of a population group or healthcare sector.

ADSS 8010 - Organizational Development and Change in Health Services Organizations. Three (3) credits. Pre-requisites: ADSS 8005.
Organizations in the health service sector use organizational development strategies and interventions to enhance organizational performance. This course provides an opportunity to gain a more advanced

appreciation of organizational development and change in the context of an integrated and complex environment that places new demands on accountability and innovative practice in health services organizations. Through lectures, case discussions, oral presentations and Web interactions the student develops the skills to design and facilitate strategic organizational development interventions in the health services sector. At the end of the course, students will be able to demonstrate their ability to apply knowledge of organizational development theory and practice in the appraisal of organizational changes or transformations, and their impact on the performance in the health system.

ADSS 8011 – Health Systems and Policy. Three (3) credits.
This course has the purpose of providing students with a comprehensive understanding of health systems, their organization and operation: and how politics and policy shape decisions on health priorities, stakeholder participation, and resource allocation. The course employs a combination of history, theory, and data to study health systems, the delivery of health services, and health policy, with a specific emphasis on Puerto Rico and the United States. Also, the course exposes students to models that are commonly used for the examination of policy options. A comparison of international health systems is incorporated to expand the student's view of how health systems operate within the context of different countries. The objective of the course will be achieved through interactive lectures, class discussions, and anecdotal pedagogy.

ADSS 8105 – Applied Public Health Leadership Seminar. Two (2) credits.
The purpose of the course is to distinguish principles of leadership to public health practice. The students will evaluate leadership values and skills relevant to public health practice for performing in leadership positions and critically analyze leadership applications in public health practice. It is expected that the students will maximize their leadership skills by a process of feedback, reflection, and practice. The course includes self-assessment exercises, role-play and group discussion exercises among others. During the course, students will recognize one's own strengths and weaknesses in leadership skills relevant to public health practice and will create a personal leadership action plan.

ADSS 8205 - Financial Management in Health Systems. Three (3) credits. Pre-requisites: ADSS 8005.
This course introduces students through interactive lectures, workshops, group discussion, and case studies to the theory of financial management for healthcare systems. The corporate finance theory and its application to healthcare including budgeting and cost of capital, leasing and asset financing, financial distress and agency theory are discussed. Students will learn about the key financial activities such as financial statement analysis, budget planning, projects financial evaluation, financing decision making, and cost analysis. Students are expected to be able to perform financial analyses, recommend courses of actions in public and private healthcare systems, present their results and recommendations based on the theory discussed in class.

ADSS 8206 - Economic Analysis for Health Systems Management. Three (3) credits.
This course describes and examines the various components of the Puerto Rico health care system within and economic framework. The relationship between health, human capital and economic development are discussed. It conceptualizes health as an investment in human capital, as a function of social and economic determinants, health services, private and public financing, health care markets and government policies using economic theory, tools and real-world examples. The course will discuss current public health policies related to the economic structure of healthcare system, its financing, the markets for health care services, the role of government, the impact of innovation and incentives for quality. Finally, students will be able to address the role of economic evaluation methods to improve the efficiency of the health care system in providing services and producing health for all societies.

ADSS 8305 - Health Services Research. Three (3) credits. Pre-requisites: BIOE 8005, EPID 8002.
This course describes how to apply research methods and address recurring issues in health services research. The purpose is to enable students to explain and use research methods. It presents the methods of research in health services organizations and systems, including health services research conceptualization, study design, sampling, measurement, data analysis and reporting, and research ethics. Through lectures, group discussions and independent study the course provides an overview of strategies used in the literature to translate research into practice and policy. By the end of course, the students will be able to outline their research question, provide appropriate justification for conducting additional research in this area, review the relevant literature, and formulate a study design for a research proposal.

ADSS 8306 - Dissertation Proposal in Health Systems Analysis and Management. Three (3) credits. Pre-requisites: Graduate student must approved comprehensive exams.
The course is an Integrative Learning Experience for doctoral students of Health Systems Analysis and Management specialty. In this course, the student will demonstrate mastery in the acquired competencies by designing a research proposal that represents a theoretical and methodological contribution to influence public health practice, programs, policies or systems. The student presents the problem, research questions, and study methods as a proposal for approval of the Dissertation Committee. The dissertation can be based on program evaluation, policy analysis, development of an intervention, design, and implementation of a public health program, development of a legislative proposal, or a traditional research dissertation from a public health perspective. The student will present in writing and orally a research proposal applying theoretical and methodological principles of public health.

ADSS 8307 - Health Services Evaluation. Three (3) credits. Pre-requisites: BIOE 8005, EPID 8002.
This course introduces students to the role of evaluation in program management, with an emphasis on the types of evaluation questions that are appropriate at different stages of program history and the methods that can be applied to answer them. Students will recognize strengths and limitations of evaluation methods and will understand their applicability for decision-making, contingent on the stage of program implementation as well as on political, time ethical, and fiscal constraints. Using interactive lectures and group discussions, students are expected to understand the basic methodological tools of epidemiology and biostatistics to access the strengths and limitations of the different evaluation design and to critically read the research literature. By the end of the course, students will be able to justify a need for an external evaluation and prepare a request for applications for an evaluation of a health program or service.

ADSS 8308 - Practicum in Health Systems Analysis and Management. Zero (0) credits. Pre-requisites: Graduate student must approved comprehensive exams.
This course expose the student to the professional experience of integrating public health knowledge and skills in a real scenario. The doctoral field experience of 200 hours is required of all students, regardless of prior work experience. The practicum will be an opportunity to work during daytime hours with a professional practice leader in a public or private agency or public health institution in the community. The student will be assigned specific projects designed to have the main responsibility, among with a teamwork in the organization. The result will be a product in writing and other presentation form, which is valuable for the organization. Practicum may be carried out in Puerto Rico, the Caribbean, Latin America, United States or internationally. Grading System: Passed (P), Fail (F)

ADSS 8401- Doctoral Dissertation in Health Systems Analysis and Management. Three (3) credits. Pre-requisites: ADSS 8306.
This course is an Integrative Learning Experience where doctoral students of Health Systems Analysis and Management specialty conclude the research dissertation. In this course, the student will demonstrate mastery in foundational and specialty competencies to generate a product designed to influence public health practice, programs, policies or systems. The students complete the implementation of a research

proposal. The student will develop a research proposal that represents a theoretical and methodological contribution to influence public health practice, programs, policies or systems in the specialty area. Students will work under the guidance of the Doctoral Dissertation Committee. At the end of the course, students are expected to present the results of their research in writing and orally.

BIET 6005 - Foundations of Bioethics. Three (3) credits.
The course introduces the student to ethics as a philosophical discipline that studies moral life from the values perspective, moral duties and principles. Ethics and moral concepts, genesis of moral phenomenon and the relation between moral experiences and ethical theories are examined through the discussion of the most important theories in the western tradition. The second part of this course introduces bioethics as an ethic applied to the field of life sciences and health professions. Also, some of the most important current theoretical paradigms are studied. The student is expected to apply studied theories to critical analysis and discussion of cases related to public health and health services delivery.

BIET 6009 - Bioethics in Research. Three (3) credits. Pre-requisites: BIET 6005.
The course introduces graduate students into the analysis and value of scientific research and its dimensions, and in the development of value judgments to correct or improve scientific activity with human beings as research subjects. Historical antecedents of ethics in scientific research, resources for the protection of research subjects and human research subject protection committees are discussed. It emphasizes the concept of scientific integrity as the investigator's commitment with honesty and correspondence towards the research subjects. The course design is mainly based on the inductive method and activities that promote active learning and critical analysis. Instructional methods such as lectures, case study analysis, group exercises and axiological evaluation of research protocols will be used. Upon completing the course, students will be able to apply bioethical considerations to the critical analysis of biomedical and biosocial research proposals.

BIET 6015 - Clinical Bioethics. Three (3) credits. Co-requisites: BIET 6005.
The course initiates the graduate student in the theory and methods of bioethics in clinical contexts. Special attention will be given to the professional-patient relationship and ethical balance in the professional-patient decision-making process related to patient's health and well-being. The following concepts are examined: principles of bioethics in clinical contexts, clinical judgment and uncertainty in decision-making, patient's preferences from diverse perspectives, informed consent, truth-telling communication, religious and cultural diversity, patient's quality of life, process of clinical bioethical analysis, among others. Course methodology will promote critical construction of knowledge through case and socialized discussions and utilizing exploration, conceptualization and application strategy.

BIET 6025 - Social Organizational Bioethics. Three (3) credits. Pre-requisites: BIET 6005.
The course introduces the student to decisions at the level of the macro bioethics in the field of the social, organizational and public health ethics. Organizational ethics is identified as a point of departure to discuss own matters of the commercial and professional ethics, and social bioethics. The most important ethical challenges that face the field of the public health will be analyzed critically from a social bioethics perspective: the civil ethics in the western societies, the health system in Puerto Rico, the ecology and environment, and the populations in conditions of vulnerability, among others. The course learning strategies are based to promote the active learning and the critical analysis, such as, problem-based learning and the strategies of exploration, conceptualization, and application. At the end of the course is expected that the student develop a proposal to establish an organizational ethics program in a public health setting.

BIET 6035 - Teaching Methods in Bioethics. One (1) credit. Pre-requisites: BIET 6005.
The course is designed for graduate students of Health Professions. Students will have the opportunity to apply theoretical concepts and professional experience to the design of learning experiences in bioethics.

The components of the systematic planning of instruction applied to bioethics content will be discussed and appropriate models for teaching bioethics will be critically analyzed. The course will promote active learning among students through seminars, oral reports and presentations, and the development of a learning experience in bioethics. Upon course completion, students are expected to apply the theoretical content studied in bioethics basic courses to design a short course of learning activity that promotes the development of the bioethics competency in the learner and that is useful in their professional scenario/context. Grading System: Passed (P), Not Passed (NP)

BIET 6037 - Special Topics in Bioethics. Three (3) credits. Pre-requisites: BIET 6005.
The course examines current ethical issues that emerge from developments in biotechnology and biomedics, and from the complexity of contemporary society. Emergent topics in the bioethics field related to global bioethics, ethics at the beginning and the end of life, bioethics and genetics, social construction of human suffering, among others, will be presented. The course will be developed through discussion seminars and critical analysis of special topics investigated and presented by students in team work groups. Also, lectures and discussions will be presented by invited professors. During the course, student is expected to integrate and apply the theories presented in previous courses to the discussion and critical analysis of the topics.

BIET 6105 - Research Seminar in Bioethics. Three (3) credits. Pre-requisites: BIET 6005, BIET 6009, BIET 6015, BIET 6025.
The course provides an integrative experience in which the students can apply concepts acquired in bioethics theoretical courses in order to develop a research project or a practicum experience in a health services institution. The students will select a topic relevant to bioethics, to conduct a research or a service project with publishable results. Project could be on topics of student's interests, related to organizational ethics, clinical bioethics, social bioethics, research ethics, intellectual foundations of ethics, and others. The course consists of seminars, independent study, and presentations of student's projects. Students will conduct their projects with the assistance and supervision of a professor expert in the topic. At the end of the course, the student will present their projects orally and submit a written document that can be published.

BIOE 6525 - Statistical Analysis. Five (5) credits.
The purpose of the course is to provide participants with tools to identify, design, apply and explain the most appropriate qualitative, quantitative and mixed statistical methods for investigation of various Public Health issues at multiple (individual, group, organization, community and population) levels. The main topics of the course are the following: linear regression models, stratified analysis, logistic regression model, Poisson regression model and survival analysis. To facilitate statistical calculations, some statistical software will be used, such as STATA or SPSS. The course will be offered face-to-face, through interactive lectures, practical exercises, and discussions. At the end of the course, the student will be trained for the analysis and interpretation of data related to different epidemiological designs.

BIOE 6526 - Applied Statistic Methods in Epidemiology. Three (3) credits. Pre-requisites: BIOE 6525, EPID 6523. Co-requisite: SALP 6250.
This course, offered through the face-to-face modality, is intended for students enrolled in the Master's degree Program in Public Health with a specialty in epidemiology. The course will provide the statistical basis for carrying out the inferential analysis of data obtained from different epidemiologic designs using the STATA version 15 software. Through interactive lectures, group discussions, practical learning exercises, and case studies, students will be exposed to the following topics: sample size estimation and statistical power, analysis of variance, correlation and linear regression, logistic regression, Poisson regression, and Cox regression or proportional hazards regression. Finally, students will use the analytical skills acquired in the course to explain the behavior of public health problems in the population, essential information for public health planning and policy.

BIOE 6535 - Statistical Inference. Four (4) credits. Pre-requisite: BIOE 6525 or equivalent.
This course is intended to develop skills to applied inference statistics in the field of public health. Through interactive lectures and group discussion, students will learn the main topics of the course are the following: evaluation of statistical hypotheses to compare two independent samples, analysis of categorical data, analysis of variance for fixed and random effects, multiple comparisons, stratified analysis and analysis of longitudinal studies. In-class practical exercises will be use to implement inferential statistical methods on database using software like STATA, or other open source software. Students are expected to select and apply appropriate inference statistical in public health issue analysis.

BIOE 6537 - Applied Nonparametric Statistics. Three (3) credits. Pre-requisites: BIOE 6525.
This course introduces students to the wide range of useful nonparametric methods applied to public health field. Some of those methods are theoretical, others are computational using software like STATA, or other open-source software. Through interactive lectures and group discussions, students will learn notation of nonparametric inference, empirical probability distribution, Jacknife and Bootstrap methods, Hypothesis testing, Rank test, Friedman test, Mann-Whitney U-test, Kruskal-Wallis test, randomness test, Spearman Rank-order correlation coefficient, Goodness-of-fit and nonparametric regression. This course will consider a modern and classical view of nonparametric statistics. Students are expected to select and apply appropriate non-parametric statistics in public health issue analysis.

BIOE 6545 - Introduction to Sampling Theory. Three (3) credits. Pre-requisite: BIOE 6535.
The purpose of the course is to provide participants with tools to identify, design, apply and explain the most appropriate sampling and estimation methods in various Public Health issues at multiple (individual, group, organization, community, and population) levels. The course explores survey design and properties of estimators for the main design components used in probability sample: simple, systematic, stratified and cluster sampling. To facilitate sampling design, analysis and graphical illustrations, software will be used, such as: R and QGIS, or other open—source software program. Quality improvement methods will be presented. The course will be offered onsite through interactive lectures, practical exercises, and discussions. At the end of the course, the students will be able to analyze survey data, and gain experience in dealing with graphical illustrations, nonresponse and other challenges.

BIOE 6555 - Regression and Correlation Analysis. Three (3) credits. Pre-requisites: BIOE 6535.
This course aims to study the statistical association between variables with the purpose to evaluate the relationship between the expected value of a quantitative random variable and a group of predictor variables, using a linear equation. Through interactive lectures and group discussions, students will discuss linear regression models and generalized linear models, emphasizing in criteria for their model selection and validation, estimation of parameters by the maximum likelihood method, evaluation of potential confusion variables and their interaction terms, and estimation of the magnitude of the association through the odds ratio and the relative risk. Practical exercises will be use to implement regression models on database using STATA, or other open source statistic software. Students are expected to select and apply appropriate regression models in public health issue analysis.

BIOE 6575 - Basic Medical Statistic. Four (4) credits.
Study of statistical concepts and methods of current application in medical research, that enables the student to critically read medical literature and conduct and interpret common statistical tests. Reading, tutoring, and discussion sessions.

BIOE 6605 - Statistical Computing Applied to Public Health. Four (4) credits. Pre-requisites: BIOE 6525, BIOE 6535.
This course exposes the students to develop your ability to perform statistical computing in the analysis of public health databases. Through interactive lecture, and group discussion, the course will cover

programming topics vectorization, data input and output, object-oriented programming, statistical and computational methods such as visualization, optimization, simulation, resampling, classification, and modern statistical methods. Practical exercises will be use to implement statistical computing using software like R, STATA, or other open source software. Students are expected to implement statistical methods using a workable software with diverse data structures.

BIOE 6615 - Applications of Epi-Info. Two (2) credits. Pre-requisite: BIOE 6525. Co-requisite: EPID 6523.
The course is designed for health professionals with interest in the analysis of epidemiologic data with the computer package Epi-Info. Themes to be covered include Creations of Questionnaires, Protection of Data Against Errors by Setting Up Ranges and Legal Values, Data Entry and Statistical Analysis. The student is expected to develop the skills to create databases and analyze data derived from epidemiologic study designs using the computer package Epi-Info. The course will be offered as a workshop where each session features a discussion of theory and computer laboratory exercises.

BIOE 8005 - Advanced Methods in Biostatistics. Three (3) credits. Pre-requisite: BIOE 6535 or equivalent.
The purpose of the course is to provide participants with tools to identify, design, apply and explain the most appropriate qualitative, quantitative and mixed statistical methods for investigation of various Public Health issues at multiple (individual, group, organization, community and population) levels. The main topics of the course are the following: linear regression models, stratified analysis, logistic regression model, Poisson regression model and survival analysis. To facilitate statistical calculations, some statistical software will be used, such as STATA or SPSS. The course will be offered face-to-face, through interactive lectures, practical exercises, and discussions. At the end of the course, the student will be trained for the analysis and interpretation of data related to different epidemiological designs.

CISO 6099 - Special Topics in Social Sciences. One to six (1-6) credit(s).
This course will be offered by a special arrangement where the student agrees to carry out a study or research project or an independent study with a faculty member of the Social Sciences Unit. It may include the following activities: readings, literature review, field work, etc. A minimum of 24 hours are required for each academic credit, to be determined according to the type of project proposed by the student and the average time that it will require. It will be counted as an elective course.

CISO 6500 - Socio Cultural Aspects. Three (3) credits.
This course is designed for students in the masters programs in Hospital Administration and Public Health. It offers a general overview of the nature and functioning of the social system from the health systems perspective. The socio-cultural and psychological dimension of health conduct will be explored. The systems of health such as the hospital health services systems, etc., will be examined from a sociological and psychosocial perspective. This course is offered during the second trimester.

CISO 6501 - Social Structure and Social Change. Six (6) credits.
This course offers an intense and systematic analysis of the various theories of the social structures and the social processes underlying this structure. It emphasizes the systemic character of the social order and its interdependent character. The course also examines the focuses and explanatory theories of social change and analysis of various monograph of divergent theoretical orientations. This course seeks to make the student conscious of the need to analyze social facts in the light of the social context in which they originate. It will expose them to the necessary theoretical elements that will enable them to examine the dynamics of social change in its historical development. This course is designed for any graduate student in the School of Public Health. It is offered during the third trimester.

CISO 6505 - Social Psychology. Four (4) credits.
This course will intensively explore the mayor psychosocial phenomena of group behavior, most particularly those associated with change and communication, particularly processes such as motivation, perception, and cognition. The seminar utilizes the group as a vehicle for instruction. The student through this process becomes an object and subject of learning. This is designed for any graduate student in the School of Public Health. Exercise of group dynamics and conferences will be the pedagogical techniques of the course. The student will be required to present a written report at the end of the semester.

CISO 6506 - Social Environment. Four (4) credits.
This course examines the processes of human in interaction with the environment from an ecological perspective. The causes and effects of the rupture of human's ecological equilibrium are discussed emphasizing the phenomenon of human growth.

CISO 6508 - Social Anthropology. Four (4) credits.
Study of the fundamental of social dynamics and structure with special emphasis in the family and the community. Study of the values, norms, and behavioral patterns as related to health and nutrition as factors of directed social change, are also studied. The course meets four hours a week.

CISO 6538 - Culture, Society, and Complex Organizations. Two (2) credits.
The main objective of this course is to offer academic experience leading to an understanding of social, cultural, and psychological variables which affect the integration of the health organizations to the community. The course will cover the following areas: circumstances by which the organization integrates with sociocultural process of society; interorganizational variables, such as, organizational structure, complexity, communication, etc. some of the topics discussed are: Interorganizational Level; Structural Integration of the Organization to the Society; Communication within the Organization, The Community and the Clients; Decision Making Process, Mechanisms to Detect Needs and Social Indicators.

CISO 6542 - Mental Health in Puerto Rico Culture. Three (3) credits.
This course is designed for graduate students in the Master Program in Public Health Education. It will discuss some definitions, uses and abuses of the term "mental health", common notions and perceptions of the Puerto Rico concerning "mental health and mental illness" and some theoretical models that offer a vision of the health individual. Upon analyzing some of the criteria that have been utilized in the attempt to define mental health, the applications for our culture will be discussed. Some indicators of mental health will be identified. The emphasis will be upon identifying the interrelation of cultural factors at level of the family, community, and society that significantly influence the mental or emotional health of the individual. The course will be offered in the third semester and is programmed for three hours of conference and/or group discussion. The student will carry out a research project that will elaborate upon one of the indicators of mental health.

CISO 6545 - Women: A Biosocial Perspective. Three (3) credits.
This course is oriented to all graduate students at the Medical Sciences Campus. It provides an overview of the interrelationship between social and health aspects of contemporary woman, and how it affects their present situation. Emphasis is placed on women in Puerto Rico. It includes the following topics: The Social Construction of Sexual Identity, Theories of Women's Status and Roles, Gender as a Social Stratifier, Existing Differences in Female Subordination, Female Sexuality, Interrelationship between Social and Health Aspects by Age, Groups, and Women and Health Delivery System.

CISO 6546 – Social Determinants and Equity in Public Health. Three (3) credits.
The course provides the student with a background on the social determinants of health and their role in the health disparities of the population. The student will develop the knowledge and basic skills to discuss how

structural bias and social inequities affect the population, producing disparities in health. Through readings, critical reflections, discussions and presentations, the inequities that arise from macro social determinants (political, economic, social and public, sociocultural values}, social stratification categories (income, class, gender, occupation, education, race/ethnicity), social environment (housing, neighborhood and work conditions), and social and collective behavior will be studied. At the end of the course the student will analyze the socioeconomic and political factors that affect the health of the population and challenge the achievement of equity in health at the organizational, community and social levels.

CISO 6547 - Population and Society. Three (3) credits.
This course offers an introduction to the study of social structure and social change and their interaction with population dynamics. The course will offer an overview of the different theoretical approaches that attempt to explain social change. It will also analyze the social structure and the social changes that have taken place in Puerto Rico and how these have affected some of Puerto Rico's demographic processes and dynamics.

CISO 6600 - Research Methods. Four (4) credits.
Basic principles about the selection, planning, and performance of research projects. Emphasis is given to the survey methodology; the basic principles of the design of forms and questionnaires is discussed, interviewing and processing statistical data is also discussed. The students meet four hours a week.

CISO 8005 - Culture, Social Inequity, and Community Health. Three (3) credits.
This course, directed toward Public Health doctoral students, emphasizes the social and cultural circumstances of the health-illness continuum. The student will analyze critically the health and illness processes from the own interpretation of the individual given the social circumstances of individuals and communities. It includes concepts such as social organization, social inequity, and the manner in which these affect the health of the individual and the community. This course will also explore the social and cultural context of behaviors in health and illness; accessibility to health care services; and the diverse responses to health problems taken by communities and individuals. The course includes topics such as the need for a social and cultural approach to health and illness; culture, behavior and health; social inequality and illness; health and illness in the world's economy; social support networks; social and cultural determinants of health and illness in the different phases of human development; health care services and the cultural and social diversity of users. The course has a theoretical and an applied approach through the use of conferences, group discussions, and independent study.

DDIT 6505 - Introduction to Public Health and Developmental Disabilities. Three (3) credits.
This course provides the student the fundamental knowledge in the basic areas of Public Health such as level of prevention, ecological system, risk, health indicator, and introduction and conceptualization of team work and interdisciplinary intervention. The framework of the above will be presented using the developmental disabilities concepts as framework.

DDIT 6506 - Typical and Atypical Child Development from 0 to 5 Years. Three (3) credits. Co-requisite: DDIT 6505.
This course provides the student the fundamental knowledge in the basic areas of typical development of infants and toddlers. The course emphasizes toward the development and visualizes the development of infants and toddlers within the family and the social context. The course includes observation and participation exercises. Throughout this course the student will study the child growth and development with an integral vision. This will be in an interdisciplinary perspective, were the student will study different development theories as a frame work of the course. The course will discuss the growth and developmental stages from birth to five years old, including the factors that could affect or impact these stages, interrupting the normal development.

DDIT 6507 - Assistance to Families with Children with Special Needs. Three (3) credits. Pre-requisites: DDIT 6505, DDIT 6506. Co-requisite: DDIT 6508.
This course provides the students the fundamental knowledge in the area of family development with special emphasis on those families that have children with special needs. This course includes a perspective about the familiar ecological systems and the attention of the family as a nucleus. The course is directed to enable the professionals that works with families of children with developmental disabilities.

DDIT 6508 - Assessment of Infants and Pre-Schoolers with Developmental Disabilities. Three (3) credits. Pre-requisites: DDIT 6505, DDIT 6506. Co-requisite: DDIT 6507.
This course provides to the student knowledge and the application of assessment procedures for the identification, screening and evaluation of infants and preschoolers with developmental disabilities or high risk.

DDIT 6509 - Community Service Delivery in Early Intervention. Three (3) credits. Pre-requisites: DDIT 6505, DDIT 6506. Co-requisites: DDIT 6507, DDIT 6508.
This course offers the student fundamental knowledge and apply experiences in early intervention models of services, its legal and theoretical bases. In the course the students will discuss the agencies, and professions function in early intervention in the process of the law's implementation. Also, the course includes observation and participation exercises, using different team models as reference. The student will realize a critical analysis of these services and of the controversies related with them.

DDIT 6510 - Planning, Implementation, and Evaluation of Developmental Disabilities-Early Intervention Programs. Three (3) credits. Pre-requisites: DDIT 6505, DDIT 6506, DDIT 6507, DDIT 6508, DDIT 6509.
This course offers the student fundamental knowledge and techniques in the planning, implementation and evaluation process of early intervention services. The course content attended to describe the service program philosophy, the need assessment and the identification of appropriate models: family centered, based in less restrictive environment, in individualize approach; and the funding strategies to the implementation. It is expected that the student presented a service of program proposal at the end of the course.

DDIT 6515 - Introduction to Nutrition and Developmental Disabilities. Two (2) credits.
This elective course applies the knowledge of nutrition to the needs of people with developmental disabilities based on the practice of scientific evidence. The basic information of the main deficiencies in the development and nutrition, general requirements and dietary recommendations are discussed. Through lectures and group discussion nutritional aspects that lead to these conditions and nutritional risks as well as interactions between drugs used to treat these conditions and nutrients and nutritional status are discussed. The state of the research is discussed in relation to nutrition and developmental disabilities after completing the course the student is expected to consider the role of nutrition as an essential discipline within the interdisciplinary team of health of this population from the point of view of nutrition assessment, nutrition therapy and monitoring.

DDIT 6535 - Seminar in the Management of Conditions and Specific Risks. Four (4) credits. Pre-requisites: DDIT 6505, DDIT 6506, DDIT 6507, DDIT 6508. Co-requisites: DDIT 6509, DDIT 6510.
This course provides the conceptual and clinical framework to examine the management of conditions and specific risks of age groups from neonate to five years from a preventive perspective of early intervention. The developmental model is discussed as an interaction of constitutional, maturational, and environmental variables. The educational methodology and application activities are framed within the interdisciplinary and transdisciplinary intervention models.

DDIT 6537 - Service Coordination. Four (4) credits. Pre-requisites: DDIT 6505, DDIT 6506, DDIT 6507, DDIT 6508. Co-requisites: DDIT 6509, DDIT 6510.
This course provides integrating experiences so that the student develops competences that will enable them to link the services system for the child with developmental deficiencies and the family. The student will learn to coordinate various components at the system with the aim of attending optimal results and guarantee the continuity of services. The educational methodology and application activities will be framed within the interdisciplinary and transdisciplinary intervention models.

DDIT 6539 - Legislation and Public Policy in the Developmental Disabilities – Early Intervention Area. Four (4) credits. Pre-requisites: DDIT 6505, DDIT 6506, DDIT 6507, DDIT 6508. Co-requisites: DDIT 6509, DDIT 6510.
In this course students examine existent legislation and public policy in the area of early intervention and developmental deficiencies. It is discussed the process of formulation of public policy as well as the needed roles and skills during the process. They study strategies to influence and modify the public policy for the benefit of the population to 0-5 years and their family.

DDIT 6545 - Interdisciplinary Practicum in Developmental Disabilities - Early Intervention. Four (4) credits. Pre-requisites: DDIT 6505, DDIT 6506, DDIT 6507, DDIT 6508, DDIT 6509, DDIT 6510, DDIT 6535*, DDIT 6537*, DDIT 6539* (*Requisite according to the student selected area of interest).
This course provides experiences in the area of early intervention with children with developmental deficiencies and their family according to selected area of interest: clinical/educational intervention, service coordination, or public policy. Throughout the practicum students demonstrate conceptual and methodological competency as well as the needed attitudes, roles, and skills for the management of different conditions or situations in public and private community settings. The educational methodology and application activities are framed within the interdisciplinary and transdisciplinary intervention models.

DDIT 6547 - Core Developmental Disabilities. Four (4) credits.
This course has been designed for students, professionals, service providers who are interested in acquiring basic knowledge on developmental disabilities. This course does not substitute the specialty courses in the Graduate Certificate in Developmental Disabilities: Early Intervention. The course intends to prepare students and professionals in the field of Public Health, and other related fields in the provision of services for this population. By means of a variety of educational strategies; including immersion into the world wide web. Students will have direct and continuous access to the professor and fellow students through e-mail, bulletin boards, discussion groups. Tests and papers will be submitted electronically. Topics will be presented in class by experts in the field. Students will have access to reading materials on each topic previous to class. As part of the course requirements students will participate in a field visit and practical experience. Course subjects cover the life span.

DEMO 6500 - Introduction to Demography. Four (4) credits.
This is an introductory and required course for the students of the Master in Demography. It presents a global vision of the study of human populations from a demographic perspective. The course provides for an analysis of the dynamics and interrelation of the different demographic variables. The course is presented through conferences and discussions.

DEMO 6518 - Human Ecology. Four (4) credits.
This course is oriented to an analysis of the spatial distribution of population and institutions and the interactive relations between individuals and groups and how these influences or are influenced by specially determined forms and processes. Emphasis will be placed on the influence socio-cultural factors such as the environment, population, technology, and organization of a society.

DEMO 6545 - Introduction to Demography. Five (5) credits.
This introductory course presents a global vision of the study of human population from a demographic point of view. It analyses the status of population as well as its dynamics and the interrelation between the different demographic variables.

DEMO 6546 - Mortality. Four (4) credits.
In this course the levels of mortality and the factors which explain the differences in mortality between some population groups and others are discussed. It also discusses the methods used for the analysis of mortality emphasizing the life table technique.

DEMO 6547 - Principles of Family Planning. Three (3) credits.
This course will review some aspects of the biology of human reproduction and the basic principles of family planning programs, the different types of birth control methods, their advantages and disadvantages, health implications, cost and efficiency. Also, the processes of motivation and communication in relation to family planning, the diffusion and adaptation of innovations. The investigation and evaluation of these programs will be discussed.

DEMO 6548 - Demographic Aspects of Health. Three (3) credits.
This course is designed for graduate students not enrolled in the Demography Program. It offers a global vision of the study of human population from a demographic point of view. It analyses the status of population as well as its dynamics and the interrelation between the different demographic variables. Different demographic techniques for the study of the status and dynamics of human populations are offered.

DEMO 6549 - Fertility and Population Growth. Five (5) credits.
In this course the changes which occur throughout the years in the levels of fertility and factors associated with differences in fertility between some population groups and others are discussed. It analyses the historic population growth trends and the determinants used in the analysis of fertility and population growth.

DEMO 6550 - Migration, Population Distribution, and Urbanism. Five (5) credits.
This course discusses the trends and differences observed in migration movements, population distribution, and urbanism within the context of an analysis of social change and development. Sources of data and different methods used in the analysis of each one of these demographic aspects are studied. The main current and characteristics of international and internal migration, settlement patterns and the structure and distribution of urban population in different types of societies are discussed. In addition, the development of different theoretical approaches in relation to migration, population distribution, and urbanism are studied.

DEMO 6552 - Economics and Population. Five (5) credits.
This course offers a general overview of the problem and central ideas of the contemporary sciences of economics, emphasizing its interrelation with demography in the theoretical as well as the empirical levels. In addition, the demographic transition of Puerto Rico is analyzed within the context of its socioeconomic development.

DEMO 6555 - Fertility and Population Growth. Four (4) credits. Pre-requisite: DEMO 6500. Co-requisite: DEMO 6546.
This is a graduate course in which changes in fertility levels and patterns are discussed. Techniques of demographic analysis are emphasized as well as factors associated with differences among some population groups. Theories and techniques of analysis of population growth are also presented as well as factors associated with fertility differences among some population groups. Fertility and population trends are analyzed and the most important theories developed to explain these changes are discussed. The most

important techniques of fertility and population growth analysis are emphasized. Exercises to apply these changes are an important component of the course as well as discussions of some relevant readings.

DEMO 6560 - Research Methods. Four (4) credits. Pre-requisite: DEMO 6500 or DEMO 6548.
In this course, the different steps involved in the research process will be addressed, as well as those methods mostly used in Demography. Special attention will be offered to those studies based on survey data since these are very useful for demographers. It is expected that at the end of the course students will have acquired basic skills to do research in Demography. The course will be carried out mainly through conferences and discussion.

DEMO 6565 - Migration, Population Distribution, and Urbanism. Four (4) credits. Pre-requisites: DEMO 6500, DEMO 6546.
The trend and characteristics of migratory movements of population distribution and of urbanism are analyzed in this graduate course within a framework of social change and economic development through lectures, class discussion, and exercises. Development of several explanatory theories of these three processes are also analyzed, as well as the data sources and methods used in their analysis. The main internal and external migrations, the population distribution patterns and the structure of the urban communities in different types of societies are studied. It is expected that at the end of the course the student had developed analysis skills for the study of these three components as well for the evaluation of the components' trends and causes.

DEMO 6601 - Population Theories and Policies. Four (4) credits.
This course analyzes the main theories concerning population dynamics since Malthus population essay. In addition, population policies derived from the different theoretical framework are studied.

DEMO 6602 - Seminar on Demographic Studies in Puerto Rico. Three (3) credits.
This seminar is devoted to the analysis of the demographic situation of Puerto Rico considering its historical trend. Changes in mortality and fertility levels, as well as the phenomenon of emigration (between The United States and Puerto Rico) and internal migration are analyzed. In terms of this analysis, population growth, its geographic distribution and population characteristics will be studied. In addition, population policies adopted in the island are studied.

DEMO 6604 - Research Project. Six (6) credits.
This course consists of the planning and execution of a research project in the field of Demography under the close supervision of the faculty of the Demography Program. Each student will select at least two preceptors according to the interest and needs of the project he wishes to conduct.

DEMO 6606 - Use of SPSS Program and other Scientific Research. Four (4) credits. Pre-requisite: BIOE 6525 (old codification BIOE 6521).
Introduce students to programming and processing of data by means of SPSS (Statistical Package for the Social Sciences). By using this program, students will learn to process data from their research, regardless of the concerned discipline. Besides, this course will provide knowledge on concepts and language used in programming so that the researcher will be able to communicate effectively with experts in this area. Students will be also initiated in the use of the software SAS.

DEMO 6607 - Population and Economics. Four (4) credits. Pre-requisites: DEMO 6500, DEMO 6546, DEMO 6555, DEMO 6565.
This course offers a general vision of the central problem and ideas of contemporary economics. It emphasizes the relationship between economics and the study of population at both, theoretical and empirical levels. In addition, this course presents the demographic transition of P.R. within its economic

development. In this way we can visualize with a real example the relationship between economic and demographic variables. The principal methods used in the analysis of the economic situation of a country are discussed. It is expected that at the end of the course students will understand and could explain the demographic processes in its relation with economic development. To attain this, lectures, group discussions and exercises will be used.

DEMO 6615 - Supervised Practice in Demography. Three (3) credits. Pre-requisites: BIOE 6525, DEMO 6500, DEMO 6546, DEMO 6555, DEMO 6560, DEMO 6565.
This is a graduate course whose objective is to provide the student the opportunity to apply to real life situations the theoretical and methodological knowledge acquired in previous courses. This experience will facilitate the student's transition from the academic to the occupational environment, since he will assume the tasks and responsibilities that a demographer can undertake at work. These will vary in terms of place as well as in content and type of problem encountered. The student will be exposed to programs at different agencies so as to become familiar with the diversity of contributions that demographers can make to the social, economic, and health life of the country. He will undertake a demographic analysis as demanded by the different institutions. In this practice, the student will be assigned to a specific agency depending on his particular interest. He or she will be directly supervised by the chosen persons at the agency and by faculty from the Demography Program.

DEMO 6621 - Research Project I. Two (2) credits. Pre-requisites: BIOE 6525, DEMO 6500, DEMO 6546, DEMO 6555, DEMO 6560, DEMO 6565.
This course is a graduate course in which students will plan and develop the proposal of their research project in Demography under close supervision of at least one faculty member of the program. During the course, students will select their research theme, will present an annotated bibliography, will write the objectives of the research, and will submit the complete proposal in typewriting. They will make also an oral presentation of the proposal. The course will be offered as a workshop. Meetings and discussion will be held with the student in order to develop his/her proposal.

DEMO 6622 - Research Project II. Four (4) credits. Pre-requisites: BIOE 6525, DEMO 6500, DEMO 6546, DEMO 6555, DEMO 6560, DEMO 6565, DEMO 6621.
This is a graduate course which comprises the development of a research project in some demographic topic under the supervision of a dissertation committee. During the course the students will: collect the needed data, create data files, process and analyze the data and will produce a written document with the results. Students will make, also an oral presentation. Periodic meetings with the members of the thesis committee will be held so as to monitor student's progress.

DEMO 6990 - Reading Course Seminar. One to five (1-5) credit(s).
This course will offer students the opportunity to carryout research in an area in which they are most interested. Once the student selects a topic, the faculty provides a bibliography about the topic selected and the student has to prepare a report to the faculty of the course.

DESS 8011 - Social Determinants of Health Graduate Seminar I. One (1) credit.
This is the first graduate seminar in Social Determinants of Health with the goal of providing students with the skills and tools necessary for research and practice on the social determinants of health. It also provides a guided process that help students towards achieving their dissertation proposal from the beginning of their studies. The seminar centers on exposing to contemporary issues in Social Determinants of Health that can aid in conceptualization of their research topic. Program faculty and other invited guests (policy-makers, community advocates, etc.) Present and share their ideas, projects and work with the students, thereby providing them concrete ideas for framing research topics and questions, which they can explore and develop

throughout their studies. At the end of course, students will identify their research interest in social determinant of health.

DESS 8012 - Social Determinants of Health Graduate Seminar II. Two (2) credits. Pre-requisites: DESS 8011.
This second seminar has the goal to continue providing students with skills and tools necessary for research and practice on the social determinants of health. Also provides students with a guided process toward the completion of their dissertation proposal. The seminar centers on the development of an annotated bibliography for the student's dissertation topic of interest which may serve as the basis for the comprehensive exams and the development of the proposal. The seminar focuses on workshops and class discussion of annotated bibliographies on specific areas of their research topic and sharing resources and literature, and nurturing inter-disciplinary exchanges on social determinants of health topics while receiving feedback from the instructor and peers. At the end of the seminar, students will be able to analyze critically issues of their research interest in the social determinants of health.

DESS 8013 - Social Determinants of Health Graduate Seminar III. Two (2) credits. Pre-requisites: DESS 8012.
The third seminar has the goal of continuing provide students with the skills and tools necessary for research and practice on the social determinants of health. Also provides the students with a guided process that helps students toward the completion of their dissertation proposal. This seminar centers on the development of skills that foster multidisciplinary and multi-sectorial cooperation in the social determinants of health. It also serves as a guided process where students can star identifying stakeholders, institutions, organization and/or communities that can serve as partners and resources for the planning and coordination of their dissertation projects. At the end of course, students will be able to promote multidisciplinary and multi-sectorial cooperation in discussion, analyze and actions in social determinants of health.

DESS 8105 - Social Theory and Public Health. Three (3) credits.
This course will examine a variety of social science theories and concepts approaching health, illness, public health and health care and their evolution through history. Drawing mainly from diverse perspectives in the sociology and anthropology of health, the course will discuss public health issues with concepts, models and methods at the individual, interpersonal, organizational, community, national and global levels of interaction. Through lectures and discussion-driven, students will emphasize the analysis of theoretical approaches of the social sciences and their contribution to our understanding of health and sociological approaches to health systems from local to global levels. At the end of the course, students will be expected to evaluate the underpinnings of diverse sociological traditions of inquiry in explaining the distribution of health and illness in populations and its implications for action in public health practice.

DESS 8198 – Dissertation Proposal in Social Determinants of Health. Three (3) credits. Pre-requisites: Have approved comprehensive exams.
This course is an Integrative Learning Experience for doctoral students of Social Determinant of Health specialty. In this course, the student will, generate a field based written proposal to appraise and address the impact and plausible pathways by which conditions in the social, cultural, economic and political structures impinge on the possibilities of living a healthy life for all. The student will design a project that advances the practice of public health within the social determinant of health perspective for approval of the Dissertation Committee. The proposal must demonstrate the student's mastery in areas of public health such as leadership, social determinants of health, and the application of state of-the art knowledge and approaches to addressing public health problems. It is expected that student present in writing and orally a research proposal applying theoretical and methodological principles of public health.

DESS 8199 – Doctoral Dissertation in Social Determinants of Health. Three (3) credits. Pre-requisites: DESS 8198.
This course is an Integrative Learning Experience for doctoral students of Social Determinant of Health specialty. The course embodies a praxis directed to problem solving in a specific social determinant area and its relation to the health of a specific population, specific health outcomes or social policy. In the course, the student will demonstrate mastery in foundational and specialty competencies in the design of a research proposal that represents a theoretical and methodological contribution to influence public health practice, programs, policies or systems in the specialty area. students will work under the guidance of the Doctoral Dissertation Committee. At the end of the course students are expected to present the results of their research in writing and orally.

DESS 8201 - Qualitative Methods in Social Determinants of Health. Three (3) credits.
This course provides students with the foundations of qualitative research designs and methods. Students will acquire the basic skills and principles needed to conduct effective, original, and responsible qualitative evaluation and research applied to public health issues. Selection of research design, study site, and population; issues and methods of data collection; participatory research strategies; qualitative analysis and the use of available software; use of systematic reviews and triangulation; and the dissemination of research results are studied. Through group discussions, case studies and laboratory exercise the students will conduct a small qualitative research or evaluation project on social determinants of health issue. At the end of the course, students will be expected to implement a qualitative research design to produce relevant information in the social determinants of health inequalities.

DESS 8202 - Statistical Measurement and Argumentation in Social Determinants of Health. Three (3) credits. Pre-requisites: DESS 8201
Evidence in social determinants of health is generated by multiple disciplines, research designs and methodological traditions. This course explores research questions, determinants, study-design, measurement, and analytic issues applicable to research into the social conditions and processes impacting health according to the social determinants of health model chosen. Among lectures, group discussion and workshops will cover including basics in social epidemiology, sociology, ethics, and economy. At the end of course students will be able to design and justify a conceptual framework to examine the relationship between social process and inequalities in social determinant of health.

DESS 8205 - Social Determinants of Health Frameworks. Three (3) credits.
This course is a detailed introduction to key concepts and theoretical frameworks synthesizing the evidence pointing to the unequal distributions of societal resources as the root causes of ill health, suffering and disease. Different approaches in social determinant of health will be analyzed. Through lectures, group discussions, and review of key literature will examine the impact on equity in health and the role of the health sector in address social inequities in health. A variety of loci of action at the societal level are presented as opportunities in which public health practitioners can act to effect positive change to promote and protect collective health. At the completion of the course, students will be expected to analyze health issues from the social determinants of health.

DESS 8206 - Community Building and Action on the Social Determinants of Health. Three (3) credits.
The course provides students the opportunity to study community building and organization approaches as a strategy to improve health and increase community capacity to organize around action on the social determinants of health. Special emphasis is given to the concepts, models and process of community organization and action and the techniques and methods it involves. Through lectures, in-class and field exercises students will learn the main public health theories, models and approaches that underlie community development and organization; and methods for engaging communities, advocacy, and for the building of partnerships. Also, students will apply knowledge for community building techniques. At the end

of course, students will be expected to critically assess the use of community building and organization strategies utilizing real community case study to address determinant issues.

DESS 8208 - Political Economy of Health. Three (3) credits. Pre-requisites: DESS 8105.
The course proposes that politics and economics are interconnected, and that the primary determinants of the unequal distribution of material resources condition people's health opportunities. The students critically examine the evidence of these influences on social stratification; identify institutions and groups involved; and weight the evidence of taking action on these determinants to produce supportive physical and social environment for the reversal of social inequities in health. Group discussions and case studies will be used to illustrate the relative effectiveness of supporting and advocating for healthy public policies in other sectors beyond the conventional health sector. At the end of the course, students will be expected to evaluate economic policies that influence health and the financing and delivery of health-related services for propose courses of action for the reversal of inequities.

DESS 8305 - Health and Social Policy Analysis. Three (3) credits. Pre-requisites: DESS 8201.
The course provides knowledge and skills for public policy development and analysis on the social determinants of health from and equity perspective. Basic concepts in policy development and analysis; overview of theories and methods in public health policy; process of public policy development and implementation; methods of impact assessments of policies; social determinants of health criteria for policy equity evaluation; and perspectives of policy analysis will be studied. Through lectures, small group discussions, and practical exercises students will learn to write and present a policy paper based on the social determinants of health with implications for public health in which the integration of concepts and methods will be evidenced. At the end of the course, students will be expected to analyze policy from equity and social justice perspective and produce a policy paper with implications for Public Health and social determinants of health.

DESS 8306 - Practicum in Social Determinants of Health. Zero (0) credits. Pre-requisites: Graduate student must approved comprehensive exams.
The practice is intended to expose the student to the professional experience of integrating public health knowledge and skills in a real scenario. The doctoral field experience of 200 hours is required of all students, regardless of prior work experience. The student will be assigned a project and will be designed so that the student has the principal responsibility, along with a team of workers in the organization. The project will be assigned by the practicum site supervisor in consultation with the academic advisor. The result will be a product in writing and other presentation form, which is valuable for the organization. Practicum may be carried out in an agency, institution, or community in Puerto Rico, the Caribbean, and Latin America, United States or other internationally setting. After completing the course, the student will demonstrate proficiency in addressing the social determinants of health as a public health professional.
Grading System: Passed (P), Fail (F)

EDSA 6005 - Learning Principles and Teaching Strategies in Health Education. Three (3) credits.
This course is geared to develop knowledge and skills of health education; especially in planning, development and evaluation of activities and educational programs. It is expected that the students analyze the different theories of learning and the models of change in behavior and develop skills in the adequate use of methods and techniques of teaching and educational planning of activities. Conferences, group discussions, oral presentations and written reports will be used to achieve the course objectives.

EDSA 6015 - Foundations of Public Health, Health Promotion and School Health. Three (3) credits.
The course introduces students in Foundations of Public Health, Health Promotion and Health Education. The emphasis to the conceptual and methodological approaches to Public Health, Health Promotion and Health Education and the application to school environment. Through lectures and discussion groups will analyze

the historical perspectives, approaches, structures and programmatic orientations tie to school health scope in Puerto Rico and in the international community. At the end of the course, the students will evaluate models associated with school health education in Puerto Rico and the international community from the perspective of Public Health.

EDSA 6025 - Prevention in Use and Abuse of Alcohol, Tobacco and Other Drugs in School Environment. Two (2) credits.
The course is designed to guide the students and the school community to the knowledge of risk factors associated to the use and abuse of alcohol, tobacco and other drugs in the school environment. Special emphasis will be offered to the analysis of patterns of mental, social, economic and cultural conduct that prevent the use and abuse of alcohol, tobacco and other drugs and the physical impact, that causes its use. Also special emphasis in the development will be made of skills to implant and evaluate programs of prevention for the reduction of the use of alcohol, tobacco and other drugs. At the end of the course, the students will develop skills to diminish the risk of use of alcohol, tobacco and other drugs.

EDSA 6029 - Topics Related with School Health Promotion Seminar. Two (2) credits.
The course brings students of School Health Certificate in topics related to School Health. In this course, the principal problems and needs of students and school community will be discussed. The themes will be analyzed from the holistic perspective, emphasizing the following dimensions: social, cultural, epidemiological, behavioral, educational and in-service. The themes discussed correspond to the priorities of health in the school setting as defined in the public policy of health of Puerto Rico and by the agencies of health and school health in international level. Through discussion groups, oral presentations, reflective diary and field trip the themes will be treated. At the end of the course the students demonstrate knowledge, attitude, values and skills necessary to develop school health interventions.

EDSA 6035 - Personal Development Workshop. Zero (0) credits.
This workshop will provide the students with a group experience in which different aspects related to their adjustment to the university will be discussed. It is expected that this experience will help the students in their group process integration. This workshop is a complement to EDSA 6557- Group Facilitator.

EDSA 6045 - Social Participation and Community Empowerment in Public Health. Three (3) credits.
This course focuses in the conceptual and methodological aspects of the process of social participation, community empowerment, and popular education in the context of Public Health. Themes related to the empowerment, as the lack of power, power theories, community empowerment, and social participation are discussed. One of the innovative aspects of the course is the teaching-learning experience based on the methodology of popular education developed by Freire. The students will have the opportunity to learn how this methodology facilitates the active participation in the discussion of different themes and offers them opportunity for a dialogue about the theory and practice of Public Health. This course is addressed to students of Health Education Program and health professions graduate students with interest in health promotion. At the end of course, students will have knowledge and skills for develop intervention with empowerment model.

EDSA 6055 - Strategies and Intervention Methods in School Health Promotion. Three (3) credits.
This course intends to guide the students in the development of intervention strategies directed to promote the health of students, the teachers, the non-teaching personnel and the community in general. Through active learning, will analyze the strategies and the intervention models on individuals, group and community scale directed to promote the school health. Also, will analyze the intervention strategies used in different programs in Puerto Rico and other countries that have contributed to promote the integral health of the students and the school community. At the end of the course the student will apply strategies and intervention models of health promotion to school community and/or environment.

EDSA 6066 - School Health Promotion Planning Projects. Four (4) credits.
This course intends to guide the students in the development of school health promotion planning projects. The theoretical aspects of the planning process and the principles and design of projects directed to school health promotion are studied. Through lectures and group discussions the student will develop the skills for the conceptualization, designing, implementation and evaluation of school health projects in the school environment. At the end of the course the student will design a school health project.

EDSA 6075 - School Health Promotion Supervised Practice. Three (3) credits. Pre- requisites: EDSA 6015, EDSA 6029, EDSA 6055, EDSA 6066.
The course is directed to the students of the Graduate Certificate in School Health Promotion. This course provides practical experience in a school setting for the integration of competences in the area of the school health promotion. In this practice, the student will show the methodological and conceptual control for the interventions carried out with the population in the school environment. Similarly, he (she) will integrate his skills attitudes in the management of the problems of this population and his environment. Through group meetings and visits to the field, it is expected that the student carry out interventions of health promotion according to those proposed in his (her) plan of action and to present a final report of the interventions carried out.

EDSA 6250 – Applied Research in Health Promotion and Health Education. Three (3) credits.
This hybrid course develops students' knowledge and skills to address a public health problem by designing a quantitative and/or qualitative research project. Through virtual workshops, case studies, and others, emphasis is placed on methodological theories and techniques to conceptualize and design research. These include formulating the problem to be investigated, contextualizing the problem in a theory framework, selecting the appropriate research approach (quantitative/qualitative), and considering basic concepts such as measurement, selection of samples, analysis of information and data. Students will acquire basic skills to perform quantitative and qualitative data analysis and interpretation using the appropriate software. At the end of the course, the students will demonstrate the competencies acquired by writing an applied research paper and a technical report on a public health problem.

EDSA 6401 -. Perspectives and Contexts of Health Promotion and Health Education. Two (2) credits.
This hybrid course exposes the student to the disciplinary foundations and the distinctive and unique approaches of Health Promotion and Health Education. Through collaborative learning, discussions forum, readings and other, the historical development, the philosophical aspects, the principles, the intervention strategies and the contexts of work and professional development will be studied. The functions of the professional, current legislation, work environments, professional trends and ethical aspects of professional practice are described. The main networks and international organizations of the professional field and the political and declaratory documents at a global level are described. At the end of the course the student will analyze the current situation of the professional field at a national and international level with a critical vision of the main philosophical debates associated to the disciplinary field.

EDSA 6402 - Foundations of Health Promotion and Health Education II. Two (2) credits. Pre-requisite: EDSA 6401.
This course is geared to the analytic examination of different theories, models, and approaches in Health Education. Traditional and innovative educational methods and techniques that can be used by health educators to stimulate changes in health behavior of groups through health education and health promotion will be addressed. Lectures, oral presentations, group discussions, readings and term papers and field visits will be used to attain the course objectives.

EDSA 6405 – Health Communication Programs Design. Three (3) credits. Pre-requisites: EDSA 6401, EDSA 6476.
development of multi-level health communication projects and programs for various settings. It promotes a critical understanding of how messages from interpersonal, organizational, cultural, and media sources affect health beliefs and behaviors and the advancement of public health. Through readings, discussions forum, virtual interactive lectures and classroom exercises, students develop the skills needed to become effective health communicators and use mass media strategically to influence public health policy and social change. Students will be able to design a proposal for a health communication campaign and will learn how to implement, disseminate and evaluate health communication programs.

EDSA 6474 - Perspectives and Contexts of Health Promotion and Health Education. Two (2) credits. Pre-requisites: ADSS 6516, EDSA 6573

This hybrid course acknowledges the managerial challenges associated with the development and implementation of health education programs. The course prepares students to effectively design and implement health education programs to optimize performance and resource allocation and achieve expected outcomes. This entails strengthening knowledge and skills to analyze key issues in human resources and the development of a culturally diverse workforce; budgeting; decision-making; identifying of internal/external funding sources; grant-writing; and promoting organizational change. Teaching strategies include interactive class exercises, interactive lectures, independent study and individual and group discussions with course instructor. At the end of the course, students will create a proposal for health education services in various settings and populations.

EDSA 6475 - Intervention Approaches for Health Promotion and Disease Prevention. Three (3) credits.

This hybrid course is designed to prepare students with the skills needed to implement health promotion and health education interventions. A variety of health promotion and health education strategies and techniques will be emphasized including, but not limited to, educational presentations and materials development, community organizing, working with an individual, and groups. In the course, students will demonstrate facilitator skills relevant to the practice of Health Promotion and Health Education. In addition, they will apply theories or models in the approach to an educational, health or social problem. The course includes virtual interactive lectures and case study analysis, among others. Students will design a theory-based health education intervention using multi-layered techniques and strategies to address the educational, health, or social needs of an individual and a group.

EDSA 6476 - Social and Behavioral Theories and Models. Two (2) credits.

This hybrid course provides an overview of health education and health behavior theory and how theory can be utilized in the field. Students will identify the impact of different physical, social, environmental, and emotional factors on behavior associated with health; and discuss how learning theories inform health education and health promotion practice. Likewise, they will apply a theory to a topic of interest related to a health issue. Students will participate in theory-based literature review, presentations, and group discussion exercises, among others. At the end of the course, students will demonstrate the knowledge and skills necessary to design a theory-based health education intervention to address a health or social need of a particular community group.

EDSA 6514 - Organization and Administration of School Health in Puerto Rico. Three (3) credits.
Study of the objectives, organization, and administration of a school health program. The student will get acquainted with the theory practice of organizing and developing school health program. Emphasis is given to main components of such program: healthy school environment, medical services, and health education.

EDSA 6518 - Fundamentals of Health Education. Two (2) credits.

Presentation of educational principles and methods used for Health Education. Emphasis is placed on working with group, and with the community in general.

EDSA 6521 - Educational Process I. Three (3) credits.
This course is aimed to make the student ready to interpret the following basic concepts: education, teaching, learning and the psychological determinants of the human behavior. Emphasis will be given to the study of learning theories and the psychological principles of learning that come from them. The student shall demonstrate his communication skills through activities aimed to that purpose.

EDSA 6522 - Educational Process II. Three (3) credits.
This course aims to the study of Health Education as a profession, its philosophy, long-range objectives and its historical development in Puerto Rico. Traditional and innovative strategies that can be used by health educators to assure changes in health practices of their clients are also studied. Conferences, group discussions, readings, field visits and oral presentations will be used in order to achieve the stated objectives.

EDSA 6524 - Health Education Program Planning. Three (3) credits. Pre-requisites: EDSA 6521, EDSA 6522, EDSA 6531, EDSA 6532. Co-requisites: EDSA 6557, EDSA 6668.
In this course, theory aspects of the planning process are studied. In addition, the steps and principles applied to health education projects and programs are studied. Emphasis will be given to the design, organization and implementation of the Health Education program in different settings and levels. The student is required to design the action plan for his or her supervised practice at the end of the course.

EDSA 6531 - Health Education Intervention Methods I. Two (2) credits.
The purpose of this course is to analyze the nature and scope of Public Health Education as a behavioral change process in regards to matters of health. Special emphasis is given to the different strategies utilized to promote changes in people's life styles and in the role of the health educator as a change agent.

EDSA 6535 - Research Methods in Education. Three (3) credits. Pre-Requisites: EDSA 6521, EDSA 6522, EDSA 6531, EDSA 6532, BIOE 6525.
This course enables the student to design a research project in the education field. Different research designs in education and the application of principal statistical procedures for analyzing data are discussed.

EDSA 6536 - Intervention Methods II. Three (3) credits. Pre-requisites: EDSA 6521, EDSA 6522, EDSA 6531. Co-requisite: EDSA 6535.
The course objective is to study the health educator's role in the community and to analyze different intervention methods used to promote changes in community and organizations. Opportunity to observe health education community based programs and projects and to identify intervention strategies used by health educators is provided. At the end of the course, the student will demonstrate on class strategies used on each model studied.

EDSA 6551 - Education to Patients. Two (2) credits.
Basic concepts in patient education as an essential process in health care. Emphasis in detection of present and future needs of the patient and his family planning; and developing a health education program.

EDSA 6555 - Health Education Programs Supervision. Two (2) credits.
This course is designed to develop in the student skills in supervision. Special emphasis is placed on the educational, administrative, consultant, and evaluative functions works. Laboratory exercises are conducted which demonstrate these functions.

EDSA 6556 - Community Mental Health. Three (3) credits.

In this course, the philosophical and historical foundations of community mental health are considered. The impact of social and cultural factors upon life style of individuals in contemporary society is analyzed. Emphasis is given to the way people deal and adjust to their environment, and the different theories of personality development.

EDSA 6558 - The Health Educator as Group Facilitator. Three (3) credits. Pre-requisites: EDSA 6521, EDSA 6522, EDSA 6531, EDSA 6532. Co-requisites: EDSA 6508, EDSA 6668.
This course is designed to develop skills in the student as group facilitator. Different aspects of the facilitator's role are analyzed as well as factors that affect his/her performance.

EDSA 6563 - Intervention Methods in Health Promotion and Health Education I. Three (3) credits. Pre-requisites: EDSA 6401 or EDSA 6561, MEDU 6500.
The purpose of the course is to study Health Promotion and Health Education as a process for the development, maintenance and behavior modification in the human being. The goal is to develop the optimum state of health in the individuals. Emphasis will be given to the study of strategies to change individual health behaviors such as: behavior modification, assertive training, micro counseling, and management of emotion through the life. Emphasis will be given to categories of intervention methods, and strategies to be used in small groups interventions. The students will apply these strategies in their interventions. There will be conferences, group discussions, role playing, lectures, and field experiences.

EDSA 6565 - Administrative Aspects of Health Promotion and Health Education Programs. Three (3) credits. Pre-requisites: EDSA 6405 or EDSA 6564, EDSA 6563.
This course is geared to provide students with an overview of the administrative theories and their application to Health Promotion and Health Education programs. General principles of supervision as well as the roles of the supervisor are also included. In addition, the course seeks to initiate in the students the development of the necessary skills that contribute to assume an effective administrative role. Theoretical component of the course will be given through lectures and group discussions and will be also complemented with practical experiences in public and private organizations that have health promotion and health education programs.

EDSA 6566 - Research Methods in Health Promotion and Health Education. Four (4) credits. Pre-requisites: BIOE 6525, EDSA 6402 or EDSA 6562, EDSA 6563. Co-requisite: EDSA 6567.
This course is aimed to provide students information and practical experience in the different stages of proposal design in the field of Health Promotion and Education. Several research designs and methodological procedures are discussed. The students will apply their knowledge by developing a research proposal. Conferences, group discussion, analysis of research articles and instruments for gathering data and written work will be used.

EDSA 6567 - Advocacy, Intersectoriality, and Community Action-Mobilization. Three (3) credits. Pre-requisites: EDSA 6401, EDSA 6476.

The hybrid course describes the main intervention strategies associated with Health Promotion and Health Education at the political, community and institutional levels. Emphasis will be placed on strategies linked to the development of public policies favorable to health, namely, the modalities of health advocacy and activism, the process of public policy analysis, and the legislative process. Through instructional videos, discussion forums, and field visits, the graduate student will be exposed to the concepts, values, and methodologies of intersectoral work and the principles of community work; leadership development; and approaches to community engagement and mobilization. At the end of the course, the student will be able to integrate community outreach actions, health advocacy, and intersectoral actions in the design of community outreach projects.

EDSA 6568 - Group Facilitation Skills. Three (3) credits.
This hybrid course is addressed to graduate-level students. Its purposes are to enhance students' knowledge and skills in managing group functions, to develop communication skills and cultural competence, and to raise awareness of the ethical and legal aspects in the design, implementation, and evaluation of educational activities and group facilitation. The course takes a laboratory approach in which students will have the opportunity to practice the roles of facilitator, co-facilitator, and observer of group functions. The educational strategies that will be utilized are synchronous lectures, virtual workshops, socialized discussions, group exercises, cooperative learning and role playing. At the end of the course, students are expected to be able to design and implement educational activities in a community scenario.

EDSA 6570 - Health Promotion and Education Program Planning. Three (3) credits. Pre-requisites: EDSA 6402 or EDSA 6562, EDSA 6563.
In this course, theory aspects of the planning process are studied. In addition, the steps and principles applied to Health Education projects and programs are studied. The students will develop the skills for the design, organization, and implementation of the health promotion and health education program in different settings and levels. The course will be offered through conferences and group discussion.

EDSA 6571 - Health Promotion and Health Education Evaluation and Measurement. Three (3) credits. Pre-requisites: ADSS 6516, EDSA 6476.
This hybrid course introduces the graduate student to the field of evaluation and measurement of health promotion and education programs. The course is designed to develop knowledge and skills for the evaluation of programs, projects, and initiatives associated with discipline. The fundamental concepts of evaluation will be discussed, as well as the models, designs, and methods of data collection that are useful for evaluative judgment. In addition, the most used measures will be presented considering the theoretical models of the field of health education referenced in peer-reviewed journals. The course will be offered through virtual interactive lectures, workshops, group discussions, workshops, virtual labs, videoconferences and independent study. At the end of the course, students will be able to design an assessment plan with a data collection instrument that demonstrates the application of their knowledge to a real setting.

EDSA 6572 - Health Promotion and Education Research Project. Three (3) credits. Pre-requisites: BIOE 6525, EDSA 6566.
In this course, student must implement a research project that represent a contribution to the knowledge and practice of Health Promotion and Education. An oral presentation must be made to the research committee. Student must complete the research project under the supervision of the research committee. Individual and group discussions and meeting with members of the research committee, independent study and written work will be used.

EDSA 6573 - Assessment and Planning in Health Promotion and Health Education. Three (3) credits.
Through this hybrid course, students will gain an understanding of how to assess needs, assets, and capacities for health promotion and health education programs. Students will identify planning theories, concepts, models, and techniques. They will also determine the purpose of the evaluation, describe the process, and identify methods for evaluating public health programs. It is expected students develop the necessary knowledge and skills to design a health promotion/education program using elements such as goals, objectives, strategies, and implementation activities. The course will be offered through face-to-face, synchronous or asynchronous sessions, interactive conferences, group discussions, among other educational techniques. At the end of the course, students will be able to design a Health Education and Health Promotion Program.

EDSA 6575 - Intervention Methods in Community Mental Health. Three (3) credits.

This course presents an overview of the different intervention methods derived from the study of theoretical models of human behavior. Different methods utilized in Health Education practice to promote changes in the community and in organizations will be analyzed from the mental health point of view. The student will design an action plan for an educational intervention.

EDSA 6576 - Mental Health Problems Seminar. Three (3) credits.
Priority problems in mental health in Puerto Rico will be considered in this course. The psychosocial aspects of problems such as: violence, substance use and abuse, family conflicts, and problems related to sexual behavior will be analyzed. Students will have the opportunity to make field visits to related programs and agencies.

EDSA 6577 - Introduction to Theoretical Models of Human Behavior. Two (2) credits.
In this course some of the theoretical models developed to explain human behavior will be studied. Emphasis will be given to the following models: medical, system, existential, and holistic. The basic concepts, methodology, application, limitations, and evolution of these models will be considered. The course will include visits and case discussions.

EDSA 6578 - School Health Child Problems and Needs Seminar. Two (2) credits.
In this course the fundamental health problems and needs of the school-age child in Puerto Rico will be analyzed, particular consideration will be given to strategies geared to deal with these problems in a school health program, as well as the role of a school health educator and other members of a school health team.

EDSA 6580 - Introduction to Human Sexuality. Three (3) credits.
Primarily a content course for health personnel and others who will use the subject matter in their professional work. Topics include Anatomy and Physiology of the Reproductive System (male and female), Pregnancy, Prenatal Anatomic and Physiologic Sexual Differentiation and Development, The Physiology of Childbirth and Fertility Regulation.

EDSA 6581 - Human Sexuality I. Three (3) credits.
Social psychological approach to the study of human sexual behavior with emphasis on attitudes and values. The focus is on the functional rather than dysfunctional aspects of sexuality. Autoerotic, homosexual, bisexual, and heterosexual behaviors are examined. There will be site visits and interviews.

EDSA 6582 - Human Sexuality II. Three (3) credits.
Presents an overview of the dysfunctional aspects of human sexuality. Non-standard forms of human sexual behavior are examined. Emphasis on attitudes and values. Recent research reviewed. Case studies.

EDSA 6585 - The Teaching of Human Sexuality. Three (3) credits. Pre-requisite: EDSA 6580.
A practical course for the development of educational programs in human sexuality for schools, churches, agencies. Role of the family and school in sex education. Methodology and resource materials are examined. Basic questions concerning teacher's role are explored. Laboratory experience in individual and small group developments of teaching programs in human sexuality.

EDSA 6586 - Sexually Transmitted Diseases Education. Three (3) credits.
Review and analysis of the role and impact of education in the modification of sexual practices with emphasis in the prevention of sexually transmitted diseases. Includes the etiology of selected STD diseases, the group or individuals at risk, those exact behavior that education efforts must be design to influence and the STD control components which play a role.

EDSA 6587 - Counseling in Human Sexuality. Three (3) credits. Pre-requisite: EDSA 6580.

Application of individual and counseling theories and techniques to the ever emerging needs of individuals in the area of human sexuality. Psychological and social foundation underlying the counseling process; examination of relevant research data. Case studies, demonstrations and supervised practicum.

EDSA 6595 - Supervised Practice in Health Promotion and Health Education. Six (6) credits.
This course provides the student with a supervised practice by a preceptor in which he/she applies and integrates the skills of health educator in a real scenario. The student is assigned to an organization or community that provides health education programs or that incorporates health promotion in its philosophy of work in which he/she will participate in experiences that will allow him/her to perform roles of Health Educator in the context of the services offered. He/she will also estimate the needs in education and health promotion, design, implement and evaluate an action plan in order to address the identified needs. The student will participate in didactic sessions and other educational activities that will complement his/her learning experience. After completing the course the student is expected to demonstrate his/her dispositions, knowledge and skills developed for the exercise of the profession.

EDSA 6668 - Research Proposal Seminar. Two (2) credits.
This course is designed to assist individual student in the preparation of an outline or proposal for the project he or she proposes to undertake. The student will have the opportunity to study in depth the research design selected for his/her project.

EDSA 6669 - Research Project in Health Education. Six (6) credits.
The student will develop a research project dealing with a relevant problem or issue in Health Education or in a related area. The research proposal submitted by student must have the approval of his research project committee (three health professionals) before he or she begins to work in the project. This committee selected by the student and the Health Education staff, has to be in accordance with the research theme. The research project is an individual endeavor unless exceptional circumstances require otherwise. The student is required to submit the completed research paper in original and two copies to his or her committee for approval, following the rules established by one of the existing styles guides published for these purposes.

EDSA 6995 - Special Topics in Health Education. One to four (1-4) credit(s).
Individual arrangement for the graduate students to study a specific area under the guidance of a faculty member of the program. May include readings, literature reviews or other special projects. Minimum of 24 hours required for each unit of credit, up to a maximum of four credit units, to be taken as an elective course.

EDSA 6996 - Supervised Practice in Health Promotion and Health Education. Four (4) credits. Pre-requisites: All basics and specialty public health courses.

This hybrid course is a practice experience designed for graduate students of Public Health Education. The course provides the opportunity to apply knowledge, theory, and skills in real scenarios and gain practical experience in public health education practice. Program professors and on-site preceptors supervise students' progress and performance. Selected practicum settings may include state public health agencies, health-based non-profits, health insurance agencies, community-based organizations, and others. The course activities include shadowing preceptors and a social and health situational analysis. Students design, implement and evaluate an action plan in order to address the identified needs. Students are expected present a Practicum summary final report that demonstrates their ability to address public health issues.

EDSA 6997 – Integrative Experience in Health Promotion and Health Education. Two (2) credits. Pre-requisites: All public health care and specialty courses. Co-requisites: EDSA 6996.

Students will develop a small group-based ILE project to integrate Public Health Education specialty and MPH core competencies supervised by faculty. The activities of this online course may include group discussions, priority assessment exercises, virtual meetings, among others. Students are expected to submit a high-quality written product, such as policy statements, concept papers, evaluation reports, educational modules, among others, based on a priority topic for the field of Health Promotion/Health Education or a comparable unit within a selected organization. Students will determine with the Faculty Advisor how to deliver and/or disseminate their written product to community stakeholders. Also, will reflect on the ILE experience and its contribution to the achievement of competencies, and their professional development.

EDSU 6501 - Systematic Planning of Instruction. Three (3) credits.
This course provides the student the opportunity of developing the knowledge, skills, and attitudes to the roles of teacher: learning facilitator, academic counselor, human relations facilitator, member of a teaching team and a health specialist. Special consideration is given to the systematic planning and design of learning experience.

EDSU 6503 - Principles of Curriculum Design and Development. Three (3) credits.
This course is designed to develop in the participant's basic skills and positive values in the area of curricular design and development, as it relates to the educational programs in the Health Sciences.

EDSU 6505 - Principles of Higher Education. Three (3) credits.
This course presents the fundamental concepts and principles of education and its philosophical, psychological, sociological, economical, and historical bases. Laboratory exercises are directed towards the conceptualization of the principles of learning and the variables intervening in the instructional process.

EDSU 6507 - Educational Evaluation Methods. Three (3) credits.
The course presents an overview of the different methods and techniques of educational evaluation and measurement most commonly used in the teaching of Health Sciences at the university level. Special emphasis will be given to the role of testing in education, test construction and other measurement instruments. Furthermore, analysis techniques for the appraisal of students base on the data or information collected through the measuring processes will be discussed.

EDSU 6509 - Administration of Higher Education. Three (3) credits.
The course has been designed to facilitate educational programs administrator in higher education, the acquisition of knowledge, skills, and attitudes that will enable to play their administrative roles in an efficient and effective way. The course encompasses a multidisciplinary vision of the administration as a social system. An administration model is presented integrating two schools and theories within each one. The administrative process is viewed as a complex set of activities as a mean to keep, maintain, and improve educational organizations. The methodology includes seminar, practical experiences, and the application of administrative theory to higher education settings. The course is offered to graduate students and facility members with interest in this field.

EDSU 8001 - Structuring Learning and Instructional Design in the Health Sciences. Three (3) credits.
This course is designed to train interested faculty and graduate students in the Health Sciences, with the knowledge, skills and attitudes required for systematic planning of instruction in the Health Sciences context. The students are provided with the opportunity to develop an analytical approach to pedagogical decision-making related to the process of designing instruction. The essential aspects basic to the teaching process and to the structuring of learning will be studied in an analytical way. The course will include the study of systematic planning of instruction such as: selection and construction of learning objectives; selection and organization of content to be taught; selection of educational strategies and the design of instructional activities which promote construction of knowledge and critical thinking in the students; selection of

resources, and design of instructional evaluation. Current topics related to the educational process will also be discussed. The student is expected to integrate and apply the concepts acquired in the planning and development of different types of instructional designs, such as units of study, instructional guides, auto-instructional modules and course syllabi, among others. The course will be developed through group discussions and applied exercises. Three seminars will be conducted where current topics related to the instructional process will be discussed. The students will be divided in collaborative groups for researching and presenting a topic of interest to the students. The three topics will be selected according to the needs and knowledge of the students enrolled in the course.

EDSU 8005 - Teaching and Learning in the Health Sciences and the use of Media and Information Technologies. Three (3) credits. Pre-requisites: EDUC 8028, EDUC 8029, Six (6) credits - Foundations of Education Component, Six (6) credits - Planification, Evaluation, Research, and Statistics Component.
Course of the teaching of the Health Sciences component, for students of the Experimental Graduate Program-Doctor in Education (RPC-MSC). Includes the use of media and technologies of information to positively impact the process of teaching and learning. Using seminars, laboratory and independent study, the following areas are covered: availability of media and technologies of information in the MSC and the UPR system; teaching, learning, media and technology; information access and; multimedia. Culminates in particular projects, in which each student will integrate media and technologies of information to his/her teaching.

EDSU 8015 - Planning Educational Programs for the Development of Health Professionals and Health Care Systems in Puerto Rico. Three (3) credits. Pre-requisites: EDUC 8028, EDUC 8029, Nine (9) credits in Philosophical, Sociological, and Psychological Foundations of Education.
This course is based on the principles of strategic planning, its epidemiological basis, philosophical contents of quality in health care and on the design and evaluation of educational programs for health professionals. In-depth study is pursued of the implications of organizational and financial changes of the health care system and of educational programs for health manpower development in Puerto Rico. In this course, students will develop knowledge, skills and attitudes for multidisciplinary educational planning for health professionals, attuned to societal realities and needs. It is designed with active student participation. In general, the course is directed to the integration of knowledge from several disciplines; such as, Management, Education and Health Sciences. It is geared to the development of educational experiences that integrate theory and practice, by the application and transference of knowledge to new ventures in the health sector. The course is directed to students of the Experimental Graduate Program, Education Doctorate of the Rio Piedras and Medical Sciences Campus, of the University of Puerto Rico.

EDSU 8017 - Quality Improvement in Health Professional Practices, Health Professions Education Programs and Health Care Organizations. Three (3) credits. Pre-requisite: Biostatistics or equivalents.
This course provides a conceptual framework on continuous quality improvement. It examines the philosophy and provides guidelines for its implementation in health professions education programs and health care organizations, with active participation of health professionals through interdisciplinary teams. The course utilizes the educational methodology ECA, that promotes the exploration and conceptualization of knowledge and skills, and the application and integration of theory and practice. Students will work as team members throughout the educational seminar-type experience.

ENOP 6005 - Reproductive Physiology for Nurse Midwives. Two (2) credits. Co-requisites: ENOP 6007, ENOP 6008, ENOP 6035.
The course addresses the physiology of human reproduction in order to gain proficiency in diagnosis of the normal pregnancy and recognition of deviations from the normal. During class discussions and independent study the following content is emphasized: menstrual cycle, physiologic changes of pregnancy, labor and

delivery, reproductive endocrinology, conception, interrelationships between mother and fetus, maternal-fetal-placental physiology and introduction to gynecology.

ENOP 6006 - Human Sexuality and Well Woman Gynecology. Three (3) credits. Pre-requisite: ENOP 6005.
This course is designed to increase students understanding and acceptance of their own sexuality and that of others. The psychosexual development of the individuals is discussed; as well as preparation for marriage and family living. This course emphasizes the management of common gynecologic problems including sexually transmitted diseases. Parameters for differential diagnosis, treatment modalities including, co-management collaboration and referrals when indicated, are taught. Counseling, education and provision of all birth control methods will be discussed. Legal, ethical, religious issues related to family planning will also be included. This course also addresses the management of the care of the woman during the perimenopause and post-menopause including therapies for alleviating the common discomforts that accompany aging. Emphasis is given to the role of the nurse-midwife in the delivery of effective family planning services and women's health care problems.

ENOP 6007 - Basic Pharmacology for Nurse Midwifery. Two (2) credits. Co-requisites: ENOP 6005, ENOP 6008, ENOP 6035.
This course is oriented toward the review of the action, indications, contraindications, side effects of the drugs commonly used in the care of women during prenatal, labor, delivery, postpartum, family planning and in the care of the newborn. Medications, standing orders, for the nurse midwife are evaluated and analyzed.

ENOP 6008 - Normal Obstetrics Management. Three (3) credits. Co-requisites: ENOP 6005, ENOP 6007, ENOP 6035.
This course contributes to the acquisition of basic clinical knowledge of normal obstetrics and the development of skills for the management and care of the women during preconception, pregnancy, labor, delivery, post- partum, and immediate care of the newborn through class discussions and independent study. The framework of nurse-midwifery management for the primary care of normal women during the maternity care cycle and the care of the newborn is constituted. The functions and responsibility of the midwife as a health team member are discussed and stressed. The student will learn the skills and techniques relevant to give expert support and care during labor, use of analgesia, performance of local and regional anesthesia, performance of episiotomy, delivery of baby and immediate care to the newborn and mother.

ENOP 6025 - Fundamental Concepts in Public Health. Four (4) credits. Co-requisites: ENOP 6005, ENOP 6007, ENOP 6008, ENOP 6035.
In this course the Nurse Midwifery Certificate students become acquainted with basic concepts, skills, and methods that underline Public Health practice. It presents the basic disciplines in the field of Public Health using interdisciplinary approach. Through class discussions, workshops and field experiences, alternatives for meeting the needs of women and children are presented. The nurse midwifery role in health promotion, conservation and restoration, as well as disease prevention are discussed, with emphasis in their responsibility as members of the health team.

ENOP 6026 - Genetics and Genetic Counseling in Nurse Midwifery. One (1) credit. Pre-requisite: ENOP 6025 or MEDU 6500.
This course, through class discussions, provides an integrated view on genetic disorders of major public health importance. The preventive aspects, diagnostic procedures, services, resources for the population at risk are discussed.

ENOP 6027 - Problems and Complications of Obstetrics. Three (3) credits. Pre-requisites: ENOP 6005, ENOP 6007, ENOP 6008, ENOP 6035. Co-requisite: ENOP 6036.

This course is designed to provide the students, through class discussions and independent study, the basic knowledge and critical evaluation of deviations from normal, complications and risk factors affecting the health of women and fetus during preconception, pregnancy, labor, delivery, and post- partum. Building upon course work in introduction to Public Health, reproductive physiology, nurse-midwifery practice and management, normal obstetrics, and pharmacology, the students will expand their knowledge in order to promptly recognize health problems, deviations and risks, to implement prevention strategies, prevention of complications, and management of emergencies. The nurse- midwifery role in complications which require physician consultation and referral is emphasized.

ENOP 6028 - Maternal and Infant Nutrition. Two (2) credits.
This course provides the student with learning experiences in the reciprocal relationships between reproduction and nutrition. The influence of nutrition during preconception and prenatal status and final outcome is discussed and evaluated by weight gain. The effects of nutrition on physical, mental growth, and development. Interrelations between nutrition, disease, and breast feeding are also discussed. Students will gain experience in the theoretical and practical background, technical information, and practical counseling techniques for the main aspects of nutrition care during pregnancy, lactation, and infant feeding. They will prepare and maintain accurate complete and valid nutrition records, and identify problems through screening and assessment, intervention through education and management, follow up of those aspects related to the maternal nutritional state.

ENOP 6029 - Care of the Newborn. Two (2) credits. Pre-requisites: ENOP 6005, ENOP 6007, ENOP 6008, ENOP 6035. Co-requisite: ENOP 6027.
This course emphasizes the theoretical, conceptual, and practical basics fundamental to assessment and management of the normal newborn. Through class discussions and clinical experiences, special attention is given to risk factors affecting growth and development (physical, social, and emotional). Complications of the intra-uterine and neonatal periods are stressed. Emphasis is on the role of the nurse-midwife in the prevention of birth disorders, education, recognition of complications, deviations, and management of the most common disorders of the neonate.

ENOP 6030 - Planning and Organization of Maternal and Infant Nurse Midwifery Services. One (1) credit. Pre-requisites: ENOP 6006, ENOP 6026, ENOP 6027, ENOP 6028, ENOP 6029, ENOP 6036. Co-requisite: ENOP 6037.
This course presents the basic principles of health planning for the development and organization of maternal, infant and nurse midwifery services; this course will provide the basic concepts of problem solving, staffing, coordination, evaluation, and budgeting. The students will carry out assessment of the maternal and infant services at primary level of a specific area, in order to determine needs, priorities, objectives, and recommendations.

ENOP 6035 - Nurse Midwifery Practice and Management I. Two (2) credits. Co-requisites: ENOP 6005, ENOP 6007, ENOP 6008, ENOP 6025 (Not a requirement for the master degree student).
This course introduces the student to the nurse-midwifery management process as the framework for providing primary care for essentially healthy women through the life cycle. Techniques of history taking, physical assessment and utilization of common screening tests are emphasized. Principles of health promotion, disease prevention and management techniques and therapies, including complementary therapies for the treatment of common health problems of essentially healthy women are included.

ENOP 6036 - Nurse Midwifery Practice and Management II. Two (2) credits. Pre-requisites: ENOP 6005, ENOP 6007, ENOP 6008, ENOP 6035. Co-requisites: ENOP 6006, ENOP 6026, ENOP 6027, ENOP 6028, ENOP 6029.

This course is a continuation of Nurse-Midwifery Practice and Management I. Principles of health promotion, disease prevention and management techniques and therapeutics for the treatment of common health problems of essentially healthy women are included. The student is also introduced to nurse -midwifery professional issues, history of nurse-midwifery and midwifery. The professional responsibilities of certified nurse-midwives are emphasized.

ENOP 6037 - Nurse Midwifery Clinical Management and Practice. Five (5) credits. Pre-requisites: ENOP 6006, ENOP 6027, ENOP 6028, ENOP 6036. Co-requisite: ENOP 6030.
This course is given in two trimesters. Supervised clinical experience in all phases of the maternal cycle. The student assumes (under supervision) responsibility for clinical management of the essentially normal mother during antepartum, intrapartum, postpartum, interconceptual period supervision of selected groups of mothers and babies in the home, and family planning clinics. The students are also assigned for the care of high-risk cases, in order to learn medical care and management. The student is expected to give the highest quality of nursing and midwifery care to those cases. Collaborative management is expected and fostered. The emphasis of this experience is place in the knowledge, judgment and skills needed for a safe practice of nurse midwifery. Students develop increasing independence in their abilities to provide clinical care to women and their families.

ENOP 6041 - Basic Aspects of Research for Nurse-Midwifery I. Two (2) credits. Pre-requisite: BIOE 6525.
The course introduces students of the MPH with Specialty in Obstetrics-Midwife Nursing, the basic knowledge of research, as well as the necessary dexterities to be able to identify the problems related with the health and the services of the mother's health and the infant. The course will promote an experience of individual research or in groups, which will be directed to obtain scientific information that proposes alternative at short and long term to solve the identified problem. In this course will discuss basic aspects related with the identification of maternal and infant health problems, the writing of the report, and the ethical and legal aspects related with the investigation. To reach out the objectives, the professor will use the conference, the group discussion, field visit, independent work, interviews, oral and written presentation. At the end of course, the students will be able to select and work in the identified related problem.

ENOP 6042 - Basic Aspects of Investigation for Nurse-Midwifery II. Two (2) credits. Pre-requisites: BIOE 6525, ENOP 6041.
The course introduces students of the MPH with Specialty in Obstetrics-Midwife Nursing, the basic knowledge of research, as well as the necessary dexterities to be able to planning and implement a research related with the health and the services of the mother's health and the infant. The course will promote an experience of individual research or in groups, which will be directed to obtain scientific information that proposes alternative at short and long term to solve the identified problem. In this course the students will work in the planning and implementation of the research problem. To reach out the objectives, the professor will use the conference, the group discussion, independent work, oral and written presentation of a problem of carried out investigation. At the end of the course, the student will be able to finish the investigation and to offer recommendations. Grading System: Passed (P), Not Passed (NP)

EPID 6523 - Epidemiological Methodology. Four (4) credits. Pre-requisites: BIOE 6525, SALP 6006

This course presents epidemiological principles and methods as an approach to the study of health and disease phenomena, as well as their determinants. The student will recognize the relevance of epidemiology in the implementation of adequate disease control and prevention measures, the planning of health services, and the study of the causes and natural history of diseases. Through interactive lectures, discussions, case studies and practical exercises, videoconferences, interactive multimedia resources and online quizzes, topics such as concepts of causality, descriptive epidemiology, hypothesis formulation, analytical epidemiology and others will be discussed. community. After completing the course, students can use the epidemiological

method to describe and analyze diseases and other public health problems in the community. The course will be offered in in-person or hybrid modality.

EPID 6524 - Community Health Needs Assessment. Two (2) credits. Pre-requisites: BIOE 6525, EPID 6523
This course is aimed at students of the Master in Public Health with specialties in Epidemiology or Biostatistics. It will enable students to integrate foundational and specialty competencies in order to develop a research proposal to address a specific health problem in a community. The course will give the students the opportunity to underscore in the proposal: identification of the research problem, literature review on the subject, formulation of the research question, identification of the limitations on resources and the scope of the research, formulation of the study hypothesis, selection of the epidemiological and sample designs, and the data processing, description, and analysis plan. The main teaching strategies of the course include discussion of readings, interactive lectures, presentations and reports, small group activities, and field experience in the study community.

EPID 6525 - Immunization Program in Latin America and Puerto Rico. Two (2) credits.
The purpose of this course is to teach the students to analyze the problems, available resources and actual yield, to design actions to extend coverage of the immunization programs. By means of group work in the form of workshops, where the contents of the modules noted below will be discussed. These modules have been prepared by the Pan American health organization, also the system used in Puerto Rico: I- Goals; II- Diseases; III- Vaccines; IV- Cold Chain; V- Program Management and VI- Evaluation (Theoretical and Practical).

EPID 6526 - Epidemiology of substance Use and Abuse. Three (3) credits. Pre-requisites: EPID 6523
Through lectures and group discussions this course provides the student an overview of the epidemiology of substance use and abuse with emphasis on its historical background, the high-risks groups, and their relationship to other behavioral problems such as violence, suicide, delinquency, and social disorganization. From a perspective of social epidemiology different historic and sociocultural aspects of the substance use and abuse will be discussed scientific articles on the co-morbidity between substance abuse, infectious diseases, and certain mental health conditions will be studied. Relevant methodological aspects in conducting epidemiological studies on substance use will also be analyzed. At the end of the course the student will be able to assess methodological aspects of epidemiological studies as well as the implications of their results in the etiology, treatment, and prevention of substance abuse.

EPID 6527 - Epidemiologic Surveillance. Two (2) credits. Pre-Requisite: EPID 6523.
The course is oriented towards the study of the behavior of transmissible diseases but emphasizing their prevalence in Puerto Rico and in other countries. This course provides concepts and application of one of the basic tools of epidemiology: epidemiological surveillance. Students will study some communicable diseases, current concepts, methods, and procedures related to the organization and functioning of an epidemiological surveillance system to determine public health action needs and to evaluate the effectiveness of programs. Through interactive lectures and group discussions, students will learn how to create a surveillance system for each specific need, acquiring a useful tool that can be used in the planning, implementation, and evaluation of specific public health programs. The course will teach students how to make use of epidemiological surveillance systems, through specific training in the design and evaluation of existing systems.

EPID 6528 - Epidemiology of Mental Disorders. Three (3) credits. Pre-requisites: EPID 6523.
This course is aimed at Epidemiology students of the Master in Public Health Program. It will enable students to understand, analyze and critically evaluate the current research about psychiatric disorders in the population. The students will understand the distribution of psychiatric disorders in the population. They will discuss and evaluate the prevalence and risk factors associated with common psychiatric disorders such as anxiety disorders, major depression disorder, alcoholism, and suicide. The course also includes the discussion

of concepts associated to inequities in the mental health services such as stigma and acculturation. The teaching strategies of the course include discussion of readings, interactive lectures, group presentations and reports. Students are expected to explain the magnitude of mental health disorders and discuss concepts associated to mental health conditions and health services.

EPID 6529 - Epidemiology of Chronic Diseases. Three to four (3-4) credits. Pre-requisites: EPID 6523, SALP 6006.

This course, targeted to graduate students, discusses the epidemiology of selected chronic diseases that constitute the principal causes of death in Puerto Rico and other countries. The chronic diseases to be discussed are cancer, chronic respiratory diseases and cardiovascular diseases. The epidemiology of diabetes and hypertension are evaluated. The principal risk factors for chronic diseases are analyzed taking into consideration the development of prevention activities. The students will have the opportunity to integrate concepts and knowledge develop through this course, as well as in previous courses, through the revision and critical analysis of scientific literature. The course is offered through face-to-face modality. The learning activities include interactive lectures and group discussion of current issues in chronic disease epidemiology.

EPID 6530 - Statistical Methods in Epidemiology. Five (5) credits. Pre-requisite: BIOE 6525 (Old codification BIOE 6521).

Designed as part of the concentration in Epidemiology of the M.P.H. Program. Topics included are: Statistical Inference, Sampling Theory, Regression Analysis; Non-Parametric Tests and Life Tables. Other topics are The Principles Methods and Techniques of Statistics as Applied to the Design, Development and Analysis of Epidemiological Studies.

EPID 6535 - Epidemiology of Infectious Diseases. Four (4) credits. Pre-requisite: EPID 6523 (MS EPID).

The course is oriented towards the study of the behavior of communicable diseases in general and of some of them in particularly, in Latin America and in other countries. Through interactive presentations and group groups, students will learn about some communicable diseases, as well as concepts, principles, methods and procedures related to the organization and functioning of the epidemiological surveillance system. At the end of the course, students are expected to know and apply knowledge about natural history and disease transmission to control and prevent infectious diseases of current importance.

EPID 6536 - Epidemiology and Pathogenesis of Cancer. Three (3) credits. Pre-requisites: BIOE 6525, EPID 6523.

This course is aimed at graduate students who will acquire knowledge about the epidemiology of the most common human cancers within the environment-genetic multi-causal framework. The course involves the adequate application of basic concepts in cancer epidemiology such as the evaluation of designs and research methods, the identification of risk factors, the critical evaluation of the results of epidemiological studies, the application of causality criteria, the discussion of aspects related to the management and importance of cancer registries in its surveillance function and in the formulation of public policy, and the applicability of the strategies for cancer control and prevention at the population level. The learning activities include interactive lectures and discussion of current issues in chronic disease epidemiology. Students will have the opportunity to integrate knowledge developed, through the revision and critical analysis of scientific literature.

EPID 6539 - Epidemiological Aspects of Public Health Problems. Two (2) credits. Pre-requisite: EPID 6523.

This course provides practical epidemiology training in the management of Public Health problems through a detailed examination of origins and rationale of established policies and guidelines that pertain to disease-prevention/control.

EPID 6545 - Introduction to Pathobiology. Three (3) credits.
This course is designed to familiarize students with the physical, physiological, and mental responses of man to infectious and noninfectious disease causing agents. The immediate and intermediate effects of the most common diseases in Puerto Rico are studied.

EPID 6547 - Methodological Principles in Occupational Epidemiology. Two (2) credits. Pre-requisite: EPID 6523.
Epidemiological methods applied to the study of health problems related to the occupational environment.

EPID 6549 - Advanced Research Methods in Epidemiology. Five (5) credits. Pre-requisites: BIOE 6525, BIOE 6545, BIOE 6605, EPID 6523.
This is a course in advanced epidemiological research geared to students of the Master's in Sciences in Epidemiology Program. It focuses on the different epidemiologic research designs; their characteristics, advantages and disadvantages. Data collection methods are also examined in terms of the adequacy of each one for the different epidemiologic research designs discussed. The students will have the opportunity to develop and to apply the statistic reasoning necessary for the quantitative analysis of each of the research designs studied. The students will also have the opportunity to discuss various statistics packages to carry out the statistical analysis for each design. It is expected that the students will be able to integrate and apply the acquired knowledge in: (1) The elaboration of the different epidemiologic research designs, (2) Selecting the most adequate data collection methods and statistical analysis according to the design, (3) Determining the sample size according to the design, (4) Identifying the statistical packages and their application to Epidemiology.

EPID 6552 - Seminar in Epidemiology I. One (1) credit. Pre-requisite: BIOE 6525. Co-requisite: EPID 6523.
The first part of the seminar will emphasizes the historical development of the discipline of Epidemiology. The second section will develop the skills of critical analysis of epidemiological research. The last portion of the seminar will introduce the student to various types of epidemiological research.

EPID 6553 - Seminar in Epidemiology II. One (1) credit. Pre-requisites: EPID 6552, BIOE 6535. Co-requisite: EPID 6523.
The course introduces the students to various topics in Epidemiology, such as: The Epidemiology of Chronic Diseases, Clinical Epidemiology, Psychiatric Epidemiology, and The Epidemiology of Preventive Health Behavior.

EPID 6554 - Seminar in Epidemiology III. One (1) credit. Pre-requisites: BIOE 6535, EPID 6523, EPID 6553.
The seminar presents the development of the epidemiological approach to health through readings and discussion of classical studies. It covers the development from the Greeks to the transition to modern Epidemiology.

EPID 6555 - Seminar in Epidemiology IV. One (1) credit. Pre-requisites: BIOE 6535, EPID 6552, EPID 6553, EPID 6554.
The Seminar IV continues with the historical perspective in the development of Epidemiology initiated in Seminar III. It is focused in the development of modern Epidemiology through the discussion of classical studies in the area since the Second World War.

EPID 6556 - Seminar in Epidemiology V. One (1) credit. Pre-requisites: EPID 6552, EPID 6553, EPID 6554, EPID 6555.
The Seminar in Epidemiology V consists of discussions and presentation of recent and current research projects in Epidemiology. The research projects to be discussed include the following topics: Sexually Transmitted Diseases, Chronic Illness and Occupational and Automobile Accidents.

EPID 6561 - Epidemiological Research I. Four (4) credits. Pre-requisite: EPID 6523. Co-requisite: EPID 6549.
The main objective of this course is to prepare the student with the required knowledge to design an epidemiologic research.

EPID 6562 - Epidemiological Research II. Four (4) credits. Pre-requisite: EPID 6561.
The main objective of this course is to prepare the student to apply the required knowledge to conduct an epidemiological research.

EPID 6563 - Epidemiological Research III. Two (2) credits. Pre-requisite: EPID 6562.
The main objective of this course is to prepare the student to apply the required knowledge to analyze and interpret epidemiologic research.

EPID 6995 – Applied Practice Experience: Epidemiology and Biostatistics. One (1) credit. Pre-requisites: Have approved all public health core courses and specialty courses. Co-requisites: SALP 6999.
This on-site course is aimed at students of the Master in Public Health Program with a specialty in Epidemiology or Biostatistics. The course provides students an opportunity to demonstrate their competency in the field of Public Health through an applied practice experience. The main teaching strategies of the course include interdisciplinary practice and small group discussions. At the end of the course, students are expected to develop, conduct and disseminate a community intervention to address a public health issue.

EPID 8002 - Advanced Methods in Epidemiology II. Three (3) credits. Pre-requisites: EPID 6523 or equivalent, BIOE 8005 or equivalent.
Through interactive lectures, group discussions, and case studies analysis, students will apply the epidemiological principles and methods in the study of health-related events. The epidemiological method will be applied for planning and evaluation of health services and public policy, with special emphasis on risk assessment and risk management. Topics include the phases of research and the need to obtain valid and precise exposure measurements to different agents associated with the disease process. The course will also include the available techniques to minimize errors. The types of epidemiological studies used to quantify the magnitude of the relation between the exposure and disease occurrence will be presented, emphasizing the advantages and disadvantages of each study design. The use and limitations of surveillance systems and national surveys in assessing, monitoring and evaluating policies and programs will also be presented.

EVAL 6511 - Introductory Proposal Seminar. One (1) credit.
This seminar introduces the student in the Master in Science in Health Systems Evaluation Research Program to the first two stages of The Scientific Method: formulation of a specific research question and the development of empirical hypothesis. Specifically, in the seminar the student is exposed to different areas or topics related to evaluation research. Students will be provided experiences that help develop skills in the appropriate formulation of research questions and hypothesis in areas related to evaluation research. In addition, the seminar provides the opportunity to discuss different factors that should be taken into consideration while selecting a research topic. Factors related to sample accessibility or availability to clinical records, extent of time required to conduct the study and costs are discussed.

EVAL 6512 - Intermediate Proposal Seminar. One (1) credit. Pre-requisite: EVAL 6511.
The course is designed to facilitate that students initiate their thesis proposal. It is conducted as an applied seminar to: 1) familiarize the student with the program requirements for the thesis proposal; and 2) provide help in the selection and elaboration of research topics. In the initial sessions the program's guide for proposal and thesis development will be discussed and the students' topics of interest will be explored. At the following sessions the students will present relevant studies in their area of interest. The research questions and conceptual model that guide these studies will be examined.

EVAL 6513 - Advanced Proposal Seminar. One (1) credit. Pre-requisite: EVAL 6512.
This seminar aims to facilitate the student's progress on the thesis proposal. It is based on the work initiated in the Intermediate Proposal Seminar. Based on the literature review during this period the student present his/her research problem, the research question (s), design, and methodology of the thesis project proposed. The purpose of these presentations is to provide the students with the opportunity to learn from diverse experiences and to examine different designs and research methods.

EVAL 6515 - Conceptualization and Methodology for Evaluation Research. Four (4) credits.
The basic steps in the research process will be studied and applied in this course. Special attention will be given to the selection, definition, and development of a problem in the area of Evaluation Research. The student will develop a conceptual model and will conduct an exhaustive literature research. Also, the student will establish the methodology, design, and procedure to be used in the study. Finally, the student will analyze data obtained from a small pilot study. The main teaching strategies will be conferences and discussions.

EVAL 6610 - Principles of Evaluation. Three (3) credits.
This course introduces the student to the role of evaluation in the Health Care Services Sector and the historical needs that have influenced the development of the discipline. They will be exposed to the history, principles, and scope of the discipline. They will become familiar with the context in which the profession is practiced as well as with the different evaluation modalities that are more frequently applied to Health Services. At the end of the course the students will have become aware of the need to acquire or develop the knowledge, skills, and attitudes provided by the academic program so that they may exercise the profession in different health care services settings.

EVAL 6611 - Evaluation Models. Three (3) credits. Pre-requisite: EVAL 6610.
This course presents different theoretical models utilized in Program Evaluation. In particular, the characteristics of diverse models are identified and their applicability to specific situations is analyzed. Students will examine the strategies, steps, and procedures required of the evaluation processes that are derived from the various models. By the end of the course the students will be able to select an Evaluation Model and design a Program Evaluation Plan.

EVAL 6613 - Seminar in Strategies for the Analysis and Evaluation of Health Problems, Programs, and Policies. Three (3) credits.
This course presents and analyses different strategies for the analysis and evaluation of the health problems, programs, and policies. It is expected that at the end of the course the student will be able to discriminate and select the best strategy for the analysis of a specific project in evaluation, planning or development.

EVAL 6614 - Evaluation of Health Services. Two (2) credits.
This course presents basic concepts in evaluation research. Emphasis is given to the different research techniques used in monitoring health programs. Some of the topics are: Surveys and Observations for Planning Intervention Strategies, Designs, and Data Analysis to Measure Program Effectiveness.

EVAL 6615 - Development of Measurement Instruments. Three (3) credits.
This course aims that students develop skills that allow them to select, adapt, or develop measures appropriate to the situation under study. Diverse data collection techniques, including their advantages and disadvantages, are examined. Specifically, we discuss self-reported questionnaire, personal interview, telephone interview, observation, and diary, among others. We also examine relevant elements in the planning and administration of diverse data collection measures.

EVAL 6616 - Evaluation Analysis. Three (3) credits.
This course will present different evaluation designs that could be used in the health field. Emphasis will be given to the circumstances under which they are feasible.

EVAL 6617 - Advanced Seminar in Measurement Problems. Three (3) credits. Pre-requisites: ADSS 6574, EVAL 6610, EVAL 6611, MEDU 6500.
Critical analysis of evaluative research papers in the area of Health Services. Emphasis will be given to measurement problems when non-parametric measures are used.

EVAL 6618 - Advanced Evaluation Seminar. Six (6) credits. Pre-requisites: EVAL 6610, EVAL 6611, EVAL 6612, EVAL 6613, MEDU 6500.
Course designed to guide the student, at an individual level, to develop and carry-out evaluate research.

EVAL 6619 - Special Interests. Six (6) credits. Pre-requisites: EVAL 6610, EVAL 6611, EVAL 6612, EVAL 6613, MEDU 6500.
Course designed so that the student has the opportunity to be in contact with the practical aspect of evaluation. It will be designed according the student's special interests. The content will depend on the subject matter that the student wants to develop.

EVAL 6620 - Applied Statistics for Evaluation Research Studies. Three (3) credits. Pre-requisites: BIOE 6525, BIOE 6535, BIOE 6555, BIOE 6605.
This course will cover the application of fundamental methods of statistical analysis for evaluation research studies. The course also includes the management of a data bank, and the creation and transformation of variables. In the application of statistical methods to evaluation research studies we examine descriptive and inferential statistics. In particular, we discuss T Test, F Test, ANOVA, Chi-Square, and the use of Odds-Ratios in evaluation research studies. In addition, the use of multivariate and logistic regression in evaluative studies will be discussed. It is expected that at the end of the course the student can successfully integrate theory and practice such that he will be able to perform the appropriate statistical analysis to a data bank in order to complete a particular research study. The course will be offered as seminar.

EVAL 6621 - Research Evaluation Seminar I. One (1) credit.
The seminar introduces the student in the Master's Degree Program in Evaluation Research of Health Systems to the first two steps of the Scientific Method, construction of a specific research problem and hypothesis empirically testable. Specifically, the seminar will provide the student experiences that develop skills in the proper construction of research problems and hypothesis in different areas of evaluation research. In addition, in the seminar will present and discuss several factors that should be considered in the selection of a research topic. For example, factors such as: access to the sample or clinical records, time to carryout the research and cost.

EVAL 6625 - Analysis and Interpretation of Evaluative Studies. Three (3) credits.
This course analyses literature in the field of Evaluation in order to judge critically the methodologies used. In addition, it provides an applied experience in the analysis, interpretation of evaluative studies. The course

emphasizes that the students relate to studies conducted in the field of Evaluation to identify alternate methodologies and examine the weaknesses and strengths of these.

EVAL 6626 - Evaluation Practice. Two (2) credits.
This course has as its fundamental purpose to provide the students the opportunity to put into practice theoretical concepts and skills acquired during the coursework. This practice facilitates the transition from an academic to an occupational environment. The students will also be able to assume the functions and responsibilities of an evaluator in a work setting. The students will develop a project in accordance with the agency.

EVAL 6628 - Principles of Cost-Benefit Analysis. Three (3) credits.
This course will introduce students to the economic evaluation of health programs and interventions. It uses an economic model to analyze health services and identify inputs of production as physical facilities, equipment, human resources, and medications. It also examines changes in health status as the output of a production process using the previous inputs. Since the availability of resources required to fulfill the population needs for health services is limited the efficient use of resources must be emphasized. Cost benefit, cost effectiveness, and cost utility analysis are discussed as methods that allow the evaluation different alternative, programs, projects or interventions. Students are expected to develop the skills and knowledge necessary to choose the most adequate methodology in their analysis of cost and benefits of health services. Case discussions, homework, and lectures are the teaching strategies used in this course.

EVAL 6630 - Strategies for Evaluation and Communication. Three (3) credits. Pre-requisites: EVAL 6515, EVAL 6610, EVAL 6611.
This course aims to develop skills in the negotiation and design of an evaluation plan. Strategies for the purpose of communicating evaluation results are also discussed. The essential stages and activities for the elaboration of an evaluation plan for a specific professional context are discussed. Specifically, aspects such as: definition of the program, objectives of the evaluation, methodology and budget are included. Skills for effective communication in the evaluator-client relationship are develop. Different formats and strategies are presented for the communication of evaluation findings. This course will be offered through lectures, work groups and students' presentations.

EVAL 6650 - Evaluation Practicum. One (1) credit. Pre-requisites: EVAL 6610, EVAL 6615, EVAL 6620, EVAL 6630.
The main purpose of this course is to provide the student with the opportunity to practice the theoretical concepts and skills developed in previous courses. The practicum will also allow the student's transition from an academic environment to an occupational setting. The student must develop an evaluation project that responds to the needs of the agency.

EVAL 6700 - Thesis Project. Three (3) credits. Pre-requisites: EVAL 6513, EVAL 6515.
The main purpose of this course is to facilitate the implementation of an evaluation research project. It has been structured as an applied project aimed at guiding the students individually through the various phases associated with the preparation of a thesis. During this process the student will discuss with his/her advisor the progress and difficulties encountered in the process of data collection, data analyses, interpretation of findings and generating recommendations.

GERO 6005 - Introductory Seminar to Gerontology. One (1) credit.

This online course is designed to prepare and encourage the student to analyze their attitudes toward older adults and their own aging process. Also, present the fundamental terms to introduce gerontology as a discipline. Through synchronous lectures, discussion forum, applied exercises, reflective learning, and other

strategies, several essential topics in gerontology are discussed, such as: myths and stereotypes, perceptions about old age, the historical pathway of gerontology, the demographics of aging, and the process of interviewing an older adult. At the end of the course, students will be able to analyze the factors that affect the ageing of the population and will reflect on their perception of old age for their personal and professional development in the future.

GERO 6495 - Planning the Interdisciplinary Intervention in Gerontology. One (1) credit. Pre-requisites: GERO 6005, GERO 6501, GERO 6503. Co-requisite: GERO 6505, GERO 6507.
This hybrid course is designed to provide students with the knowledge and skills necessary to develop a health promotion plan aimed at addressing the needs of the elderly participants of an assigned center. The course integrates theory and practice in the discussion and application of the following topics: the interview process in the elderly, the diagnosis of health needs, the planning of health promotion programs and services for the elderly, and the importance of teamwork in the care of this population. The course consists of three seminars on concepts and a practical activity. The student will apply the acquired knowledge in practical exercises. At the end of the course, the student is expected to have worked in an interdisciplinary team to identify the health needs of the elderly population in the assigned community and to develop a work plan to address them.

GERO 6500 - Introduction to Gerontology. Three (3) credits.
Introduction to the field of Gerontology as an interdisciplinary area and as a new area of knowledge, research, and services. The human life cycle is presented focusing the theme of aging as biological and social process starting at conception and finishing at the latest state, death. The subject presents the study of aging and the aged as an area of increasing importance in the field of Public Health.

GERO 6501 - Biological Aspects of Aging. Three (3) credits.
This online course with a public health perspective focuses on improving the quality of life of the elderly. The course covers the biology of aging and the physiological changes at the cellular and systemic level that occur during the aging process. Through synchronous interactive lectures and group discussions, students are provided with a biological framework to address the physical, social, and psychological needs of older adults. In addition, the main causes of disability in the elderly produced by the synergy of the aging process, health conditions and the environment are addressed. The main goal is to propose public health intervention strategies to delay disability and to understand morbidity, which have social costs. At the end of the course, students will know the principles of public health that can help attenuate the effects of aging and its relationship with disability.

GERO 6503 - Psychological Aspects of Aging. Three (3) credits.
This online course provides students with a multi-disciplinary view of the psychological aspects of aging. The course provides simulated and real-life experiences that will help students understand changes associated to normal aging, environmental factors, psychopathology, communication disorders and cognitive aging. Students will discuss topics such as retirement, sexuality, life-styles, depression, Among others. Special attention will be paid to death and its impact on families. Through synchronic and asynchrony lectures, group discussions, and virtual case study analysis students will understand the many aspects of aging presented in the context of our Puerto Rican setting. At the end of the course, students will be able to address biosocial issues from a psychological perspective to strengths older adults' capacities.

GERO 6505 - Clinical Aspects of Aging. Three (3) credits.
This online course provides students with a clinical and public health perspective to address the physical, social, and psychological needs of older adults. Through virtual interactive lectures, discussion forums, case discussions in virtual rooms, among other activities, the course will cover the most common diseases and

chronic conditions that affect older adults. Topics such as management of medicines and polypharmacy, nutrition and other important health-related issues for the health promotion of older adults will be studied. It also covers environmental and self-care factors that affect older adults and their relationship to disability. At the end of the course, students will apply clinical knowledge within public health strategies for health promotion and disease prevention among older adults.

GERO 6507 - Social Aspects of Aging. Three (3) credits.
This online course introduces students to social gerontology from a public health perspective. Social factors impact on the aging process are analyzed, with emphasis on their relationship with older adult health and wellbeing. Similarities and differences in aging experiences from different local and international social and political contexts will be compared and analyzed. Through interactive lectures, discussion board, collaborative learning experiences and oral presentations students discuss main sociological theories as they apply to aging, social transitions in the aging process, the economics of aging, and the main problems facing older adults and aging societies. At the end of the course, students will be able to evaluate aging issues and the social dimensions that are affecting the aging population.

GERO 6508 - Planning Field Experience in Public Health Gerontology. Two (2) credits. Pre-requisites: All MPH Courses, GERO 6501, GERO 6507.
This course aims to initiate the conceptualization and planning of the applied field experience for the completion of the degree final requirements. Students, in interdisciplinary groups, will integrate, apply and synthesize knowledge, skills and learning experiences to the analysis of a relevant public health issue related to the older population in Puerto Rico and propose a plan to address it. Students will identify their topic of interest in coordination with the interests of an agency/organization/community in a real-world setting and develop a proposal under the direction and approval of their preceptor. The goal of the course is to demonstrate the skills and proficiency to address a public health problem or issue of interest and social relevance related to the older population in Puerto Rico.

GERO 6509 - Policy and Management Aspects in Gerontology. Three (3) credits.
This online course provides students with an integrated understanding of health policy and management for older adults. Students will explore the conceptual framework of public policy, legislation, and its relationship to the management of public health programs. Topics include the public policy process, strategic planning, governance and leadership, and advocating for aging populations. The course also addresses ethical, fiscal, and logistical challenges in long-term care. Learning strategies include interactive lectures, readings, instructional videos, small group work sessions, and oral presentations. Students will complete an analytical project focused on a public health program for older adults, applying policy analysis and management strategies to improve service delivery.

GERO 6510 - Aging and Developmental Disabilities. Three (3) credits.
The course is oriented toward the discussion and analysis of basic aspects to be considered in the provision of services to aged individuals with developmental disabilities. Manifestations of aging among individuals with developmental disabilities will be discussed, as well as models and principles for the delivery of services within a holistic, bio-social perspective.

GERO 6511 - Interdisciplinary Intervention. Three (3) credits. Pre-requisites: GERO 6501, GERO 6503, GERO 6505, GERO 6507. Co-requisite: GERO 6509.
The hybrid course provides students of the Graduate Certificate in Gerontology with the opportunity to apply the conceptual framework and skills obtained through theoretical courses, as well as the attitudes and values that have been clarified, to intervention with older adults in an institution, service agency, or community. Students will work in interdisciplinary teams to implement an intervention plan based on the needs assessment completed in the GERO 6495 Planning the Interdisciplinary Intervention in Gerontology course.

The intervention plan will involve the development and delivery of a health promotion program to be offered in the assigned practice setting, during daytime hours. Among the learning strategies to be used are interactive lectures, reflective readings, application exercises and others.

GERO 6515 - Ethical Issues Related to the Aging Process. Three (3) credits.
The course is aimed at public health graduate students who are interested in the field of gerontology and ethical issues presented by aging of the population. The main objective is that the students develop a basic theoretical framework in the field of bioethics and moral reasoning skills that enable them to identify, critically analyze and wisely manage ethical issues implicit in the care and health care delivery of the elderly population.

GERO 6516 - Productive Aging. Three (3) credits.
This is an elective course addressed to students of the Master in Public Health with Specialty in Gerontology, the Graduated Certificate in Gerontology, and master students in the different Health Allied Professions. Through conferences and groups discussion students will have the opportunity to acquire general knowledge related with the different positions about productive aging. The focus of the course will be the existent situation in United States. Equally, in the measure that is possible, the existent situation will be presented in Puerto Rico. Through literature research, group discussions, and presentations, the student will be able to argue the concerning matters with the social and economic role of people of advanced age in United States and Puerto Rico.

GERO 6518 - Public Health Practice in Gerontology. Two (2) credits.
These practices will enable the students to investigate deeper in areas of interest and needs in the field of Gerontology. Students who come into the course with previous experience in working with the elderly are assisted in selecting placements that will broaden their background in the field. The purpose in the field placement is to give students practical experiences in working with the elderly or in administering programs for older people.

GERO 6525 - Fundamentals in Gerontological Research. Three (3) credits. Pre-requisites: BIOE 6525 and a graduate level Gerontology course (GERO 6005 or GERO 6500 or GERO 6501).
This is an elective course, addressed to students of the Master in Public Health with Specialty in Gerontology, master students of the different Allied Professions to the Health, and other interested students that fulfill the established prerequisites. The course is an introduction to research in which students will have the opportunity to acquire general knowledge related with different variants of quantitative and qualitative investigation. Through conferences, group discussions, and practical exercises, existent methodologies of statistical analysis and guidelines for criticism investigation studies will be discussed. Equally it is expected that the student applies the steps to develop a pre-proposal in the Gerontology area.

GERO 6990 - Special Topics in Gerontology. One to four (1-4) credit(s).
Special elective course for the analysis or research of issues and problems related to the aging process and the aged from a Public Health perspective. May include seminars, reports, readings, workshops and field work among others. At the end of the course the student will have a profound knowledge of the topic selected and will be able to integrate the acquired concepts and apply them to real life situations. The course will be self-directed.

GERO 6995 – Applied Practice Experience: Gerontology. One (1) credit. Pre-requisites: GERO 6997.
This course provides an applied practice experience for master in public health with a specialty in gerontology. With the guidance of faculty, students will develop a project that addresses the needs of a community-based organization, a governmental agency, or non-governmental organization. The goal of the course is for students to demonstrate competency in a real-world public health gerontology setting in which

they make a meaningful contribution. Depending on the project, the final product can be health promotion materials, policy and program proposals or recommendations, training manuals and/or curriculums, among others. The course is based on the project conducted in the Integrative Experience land is aimed to guide students from the integration of knowledge to its application in public health actions.

GERO 6997 – Integrative Experience in Public Health: Gerontology. Five (5) credits.
This course is an Integrative Learning Experience for students of the master in public health with a specialty in gerontology. Students, in interdisciplinary groups, will implement and complete a project in coordination with an agency, organization, or community under the guidance of a faculty preceptor. The project will address a relevant public health issue related to the older population in Puerto Rico. The goal is for the student to comprehend the context in which public health work takes place and demonstrate proficiency in applying and integrating the knowledge and skills i acquired to the realities of the field. The project to be completed during the course can be in applied research; policy or program evaluation; or active aging and health promotion. At the end of the course, students are expected to present the results of their project in an oral presentation and a written technical report

INTD 6996 – Interprofessional Collaborative Practice in Public Health. Zero (0) credits.
This course provides the opportunity to integrate essential interprofessional education to public health students. Through modules, discussion groups and case studies, students are expected to apprehend values, roles and responsibilities of teamwork approach when addressing a public health issue. Students will participate in interprofessional teams for decision-making process based on case studies analysis to develop an intervention plan. Teams will be constituted by public health professionals and related areas to public health as physicians, pharmacists, nurses, dentists, psychologists, social workers, engineering, lawyers, architects, among others. At the end of course, students will reflect of team effectiveness in the collaborative approach to establish public health actions. The course will be offered in-person, hybrid, or online modality.

MANI 6005 - Maternal and Child Concepts and Strategies. Five (5) credits.
This is a basic MCH course, designed to analyze the determinant factors and particular problems which may affect the health of the mother and child during its growth and development. For each problem discussed, the etiology, risk manifestations, precipitant factors, and a plan of action for prevention and management are analyzed. The student will develop appropriate criteria to identify needs to be satisfied in order to promote optimum health status of the MCH population. The course deals with the application of the technical tools of health planning needs for the development and organization of MCH programs. The student will carry out an assessment of the maternal and child health of a specific region or community. Priorities will be ranked and recommendations will be issued for the improvement and organization of maternal and child health.

MANI 6055 - Legislation in Maternal and Child Health. One (1) credit.
This course offered the student the opportunity to become acquainted with the trends and process by which the MCH programs have developed in the United States and Puerto Rico. The most important and basic MCH legislation (federal/commonwealth) are analyzed. The intervention support and advocacy for promoting, regulating, formulation of new legislation and the establishment of public policy are considered and fully discussed.

MANI 6056 - Programs and Services for the Handicapped Child. Two (2) credits.
This course will cover the health and social needs of the handicapped child and its implications for the planning, organizing, and implementing of comprehensive programs to meet those needs. Special attention will be given to the concept of comprehensive care.

MANI 6057 - The Health of the School-Aged Child. Two (2) credits.
This course is designed to study the physical, mental, and social development of the child from conception to adolescence. Special emphasis is given to the characteristics, needs, and problems of the school-aged child, with particular consideration to those which may present obstacles to learning processes.

MANI 6525 - Human Genetics. Two (2) credits.
This course is designed to provide an integrated view on genetic disorders of mayor Public Health importance. The preventive aspects as well as services and resources needs to meet the needs and demands of the population at risk and affected is discussed in detail. Such topics as Development of Screening Programs, Prenatal Diagnosis, Genetic Effect of Environmental Agents and Genetic Engineering and Legal Implications of Genetics are discussed.

MANI 6535 - Family Care in Health Services. Three (3) credits.
In this course the student is introduced to the significance of a full understanding of the socio-economic and cultural variables affecting the family for developing adequate strategies for meeting its health needs. The importance of the family as the basic social unit is stressed. The students develop the necessary skills for the utilization of analytical methods, such as the epidemiological approach, in order to study the family in the community and the health problems that affect the family as a whole. The basic aspects of health care oriented to the family are analyzed, as well as the family's behavior towards health and health care. The students acquire the basic knowledge for a comprehensive intervention in family health.

MANI 6536 - Research in Maternal and Child Health. Four (4) credits. Co-requisite: Course of Biostatistics.
This course has been elaborated to provide the students with the necessary information to design and carry out a research project in different areas of health services available to mothers and children, with the aim of improving the provision of these services. This is a combined effort with the Department of Epidemiology and Biostatistics. The course has been divided in three phases: a) General principles of research methodology: conceptualization, planning and development of a research design. Department of Biostatistics and MCH program-six sessions. b) Classroom presentation of health problems of national prominence and local relevance in the field of maternal and child health, and suggested research topics that would improve the quality of maternal and child health programs. Development of proposal-six sessions. c) Supervised field practice in areas of particular interest related to maternal and child health problems, as they concern the researcher - one hundred eight hours.

MANI 6537 - Integral and Comprehensive Care. Eight (8) credits.
This course addresses the most important and basic issues in maternal and child health and its implications for the planning, organization, and delivery of comprehensive health services. Policies, legislation, regulations, and standards which guide and determine the provision of these health services are carefully examined. The course is divided into several units: Unit I - Is an introductory unit to the course where the following topics are discussed: Health Situation of Mothers and Children in P.R., The Objectives and the Essential Elements of Care of an MCH Program; Standards and Guidelines of Care; The Delivery of Health Services as the Model of Care Being Implemented in P.R. Unit II - Makes emphasis on the women in our contemporary society and the effects of her expectations on Health Care System. Unit III - Enters into the study of human life cycle and Public Health: growth and development and its implications for organization of MCH programs and services.

MANI 6541 - Population and Family Planning. Three (3) credits.
This course focuses on population factors and their relation to socio-economic and health aspects. The course emphasized the formulation of population policies as an integral part of a country's plans for development. It discusses family planning concepts, philosophy, and methodology. The strategy to facilitate the

development and provision of family planning services, the planning, organizational management, and the evaluation aspects are fully discussed.

MANI 6551 - Human Sexuality and Health. Zero (0) credits.
The course is designed to provide a comprehensive approach to the study of human sexuality and its relation to individual and community health.

MANI 6570 - Seminar on Maternal and Child Health Services in Developing Countries. Two (2) credits.
The course discussed objectives and strategies of the different models of MCH care at primary level. Emphasis is given to the community organization, responsibilities and function of the human resources in health, from the point of view of Public Health. Studies the problems and relationship of factors affecting the health status of at risk population.

MEDU 6500 - Core Course in Public Health. Three to six (3-6) credits.
All candidates for a master's degree in the School of Public Health are required to take this core course. It provides a core content in Demography, Biostatistics, Epidemiology, Social Sciences, Nutrition, Public Health, and Health Education as applied to health and disease. The course is presented in four sub stages: Man Interactive with his Environment, Instruments of Measure and Diagnosis, Health Problems, and Strategies and Techniques of Intervention. The course have four objectives: perceive the human being as a bio-psycho-social individual. Recognize the mayor epidemiological concepts and methods used to diagnose health problems, identify services related to epidemiological vigilance and health education, and the identification of basic biostatistics methods as they related to the health fields.

NUTR 6521 - Biochemistry and Nutrition I. Two (2) credits.
The course presents basic concepts of the chemistry and metabolism of macro and micronutrients by means of lectures, presentations and readings. The student is expected to understand basic concepts of biochemistry and its relation to nutrition.

NUTR 6523 - Biochemistry and Nutrition II. Two (2) credits. Pre-requisite: NUTR 6521.
The course presents more advanced concepts of the biochemistry and metabolism of macro and micronutrients by means of lectures, presentations and readings. The student is expected to understand more advanced concepts of biochemistry and its relation to nutrition.

NUTR 6528 - Seminar in Public Health Nutrition. Two (2) credits.
This course is offered to students participating in the Nutrition Program. It is opened to doctors, nutritionists, dentists, and students who have knowledge in Biology, Physiology, and Chemistry. Specific problems related to nutrition in Public Health. Emphasis is given to existing knowledge that will contribute to the solution of such problems. The participation of the nutritionist in the solution of such problems is discussed. The students are expected to get involved in library research, and be ready for the discussion analysis and presentation of a nutritional problem in Public Health. No pre-requisite.

NUTR 6529 - Planning Public Health Nutrition Programs. Two (2) credits.

NUTR 6530 - Biochemistry and Nutrition. Four (4) credits.
This course is concerned with digestion and absorption, chemistry and metabolism of carbohydrates, lipids, proteins and nucleic acids, inorganic metabolism (including acid-base, water, and electrolyte balance), biological oxidation, hormones, vitamins, enzymes and their properties, chemistry of body fluids, physio-chemical topics and chemical composition of fluids.

NUTR 6531 - Human Nutrition. Three (3) credits.
Through interactive lectures and group discussions, this course provides students with the fundamental knowledge of human nutrition. The course emphasizes basic information in nutrition and an integrated perspective of the application of biological, and chemical principles to the use of nutrients. The individual's nutrition is discussed from the perspective of its integration in the community as well as a separate entity. The course also covers other important aspects of human nutrition such as; nutrient needs and recommendations, the metabolic role of nutrients, metabolic processes, nutritional supplementation, nutrition and chronic disease, and the relationship of diet and genes.

NUTR 6533 - Nutrition in Public Health. Three (3) credits.
This course provides a broad view of public health nutrition using a population and community-based approach for the assessment and intervention of nutrition-related public health problems. It covers the importance of public health and nutrition science, evidence, measures and standards in the assessment of public health nutrition problems and the programs and policy designed to address them. Through lectures and field visits, students will become familiar with research, programs, and policies focused solely on nutrition as well as those in which nutrition is one of several components, with special emphasis on policies and programs in the US and Puerto Rico. The course covers the main nutrition problems of vulnerable groups and the relationship between nutrition and social and environmental factors. Students will have a toolbox of skills to utilize and apply in a wide range of practice settings in the assessment and intervention of population-based nutrition issues.

NUTR 6534 - Clinical Nutrition and Diet Therapy. Four (4) credits.
This course includes the biochemical, physiological, and nutritional basis for therapeutic treatment of various conditions and diseases in man by dietary means, special emphasis is given to the nutritional aspects of those diseases which constitute public health problems, such as obesity, cardiovascular diseases, cancer, mental diseases, including drug addiction and alcoholism.

NUTR 6535 - Research Project. Six (6) credits.
Individual work, under direction, for students at the master's level. Students plan and execute a research project and apply basic techniques of scientific investigation. These include: design, sampling, direct observation, interviews and questionnaires. The students are required to present the thesis in written and oral form.

NUTR 6536 - Food Technology. Two (2) credits.
Elements of food technology.

NUTR 6537 - International Food Supply. Three (3) credits.
Review of the worldwide aspects of agriculture that are related to the need and the supply of essential foods for the world population. Production, marketing, distribution, and economic factors are considered.

NUTR 6538 - Evaluation of Nutritional Status. Three (3) credits. Pre-requisite: SALP 6006, EPID 6523.
This course trains students in the development of a nutritional evaluation through a comprehensive assessment of the dietary, anthropometric, biochemical and clinical indicators in individuals and populations. The course centers on the selection of nutritional evaluation methods that are best suited for the design, purpose and population under study. It emphasizes the importance of considering socio-cultural characteristics that have an impact on dietary practices and in the nutritional status of individuals and populations. Students apply knowledge, and methods discussed in class through a nutritional assessment of a selected population in Puerto Rico. The course includes concepts of appropriate nutritional counseling based on the health conditions of different populations. This course uses interactive lectures, group discussions, student presentations and fieldwork to achieve its objectives.

NUTR 6539 - Nutrition Health Mother and Child. Two (2) credits.
This course has been designed for the in-depth study of modern nutritional concepts, as are related to growth and development. It includes the discussion and analysis of nutrition problems which may be present at the different stages of growth and development, such as: prenatal, infant, pre-school, school and adolescent periods.

NUTR 6540 - Laboratory Techniques for Nutritional Investigation. Three (3) credits.
Through lectures, discussions, laboratory work and tutorial instruction, principles and practices of modern experimental animal research techniques are learned. The student may simultaneously participate in a variety of ongoing research projects involving animal or mammalian cell cultures.

NUTR 6550 -Human Nutrition in Clinical Medicine. Zero (0) credits. Pre-requisite: Third Year of Medicine.
This course provides the medical student an opportunity to learn the role of nutrition in medical practice. It also equips the student with information on nutrition therapy and case studies in which nutritional factors are an important consideration. Five commonly prescribed modified diets provide a focal point for discussion of specific areas of nutrition: calorie control, hyper alimentation, low fat, low sodium and fiber diet.

NUTR 6551 - Nutrition in Growth and Development. Zero (0) credits.
This course will provide the student with learning experiences in general aspects of human growth development. The interrelationship of genetic and environmental factors that determine human growth.

NUTR 6552 - Nutrition in Public Health. Zero (0) credits.
This course provides the medical student the opportunity to learn the role of nutrition in the different stages of the life cycle and the methods used to evaluate the nutritional status at the individual and community level. It also helps to integrate this knowledge with other aspects of medical practice.

NUTR 6555 - Quality of Life and Nutrition of Persons Fifty Years and Over. Two (2) credits. Pre-requisites: NUTR 6531, MEDU 6500.
This course takes into consideration the epidemiological and nutritional changes occurring in Puerto Rico during the last years which reflect needs mainly by the increasing population over fifty years of age. Nutritional, health and demographic changes and their relationship to basic needs will be addressed. Also will be discussed theories that explain anatomical and physiological modifications that accompany the aging process. The course is complemented with an analysis of nutritional habits and tendencies, nutritional needs specific to the group of interest and a description of the interrelationship between drugs and nutrients that mostly affects the elderly population. The course is offered to students of the Nutrition Program, Graduate School of Public Health. This course is given by means of lectures and group discussions, supported by visual aids. At the end of the course the student will be able to recognize and identify sociodemographic, nutritional, physiological and basic needs changes in population over fifty years old. In addition, it is expected that the students will be able to apply the concepts discussed in the course in activities and services directed to this population.

NUTR 6560 - Planning of Nutrition Program. Two (2) credits.
This course presents the evolution of concepts and levels of planning with emphasis on their application to nutritional programs principles and criteria involved in identifying field situations. Priorities of nutritional problems considering political, operative and technical problems will be addressed. The process of establishing objectives that respond to specific needs will be discussed. Administrative and functional aspects of identified projects and program will be addressed in order to reach the establish goals. It will identify the components of the nutritional strategies, to consider the different food and nutrition situations, and the most appropriate criteria to make the choice. The course is offered to students of the Nutrition Program, Graduate School of Public Health. This course is given by means of lectures and group discussions, supported with visual

aids. At the end of the course the student will have the planning knowledge to use the principles and criteria needed to define nutritional situations and problems, to establish food and nutrition policies, plans and projects. The student will be able to apply the concepts and principles to real life situations.

NUTR 6570 - Nutritional Research Methodology. Three (3) credits. Pre-requisites: NUTR 6528, NUTR 6560, NUTR 6538, BIOE 6525, EPID 6523, DEMO 6606.
This course pretends that graduate student of nutrition program be able to develop research proposals that address the public health situation in the area of nutrition. To do so, he/she will review and integrate knowledge and skills previously acquired in other courses, and perform a literature review in order to develop the idea that will be investigated. Some points to be addressed in the course are: the conception of the idea, application of frameworks to nutritional studies, research question, objectives, method development for data management. The course will be offered through lectures and group discussions. After completing the course the student is expected to present (written and orally) a research proposal.

SAAM 6005 - Environmental Chemistry. Three (3) credits.
The course reviews the physical and chemical processes that affect the transport and fate of pollutants in the environment. The sources, distribution, and transformations of these contaminants will be discussed, as well as the main chemical reactions involved in these processes. Specific examples from the literature and from current environmental issues in Puerto Rico will be included in the discussions. Additionally, mathematical problems will be used in order to quantitatively analyze these processes. At the end of the course, the students will be able to apply and integrate the concepts learned on environmental chemistry in the search of solutions to environmental and human health problems.

SAAM 6512 - Physical Hazards Control. Three (3) credits. Pre-requisites: SAAM 6543. Co-requisites: SAAM 6513.
Notwithstanding that anticipation, recognition, evaluation and control of occupational hazards constitutes the fundamental tasks performed by industrial hygienists, the effective control of occupational hazard is the final objective of every industrial hygiene effort. This course aims at providing students with the necessary knowledge for the design of effective control strategies for physical hazards such as noise, vibration, ionizing radiation and heat stress. The course covers the basic principles applied to physical hazards mitigation, including the design and evaluation of engineering, administrative and Personal Protection Equipment as control strategies for noise, vibration, ionizing radiation and heat stress. The course is designed for industrial hygiene students and may require that some class meetings be held at UPR-Cayey, NEC 018, where the IH Program has located its ventilation tunnel laboratory.

SAAM 6513 - Physical Hazards Laboratory. One (1) credit. Pre-requisites: SAAM 6543 Co-requisites: SAAM 6512.
This course is designed for industrial hygiene students and presents theory and hands-on aspects of the occupational hazard assessment process on physical hazards in the workplace. The course content includes the discussion, laboratory exercises and field work in modern methods applied to the evaluation of physical hazards in the workplace. Sampling, monitoring, and analysis for applied noise, vibration, ionizing radiation and heat, are also emphasized. Course instructor will present techniques used in noise and vibration integrated monitoring and frequency spectrum analysis, as well as those used in real time and integrated ionizing radiation and heat stress monitoring. This course may require that some class meetings be held at UPR-Cayey, NEC 018, where the IH Program has located its ventilation tunnel laboratory.

SAAM 6524 - Occupational Health Principles. Three (3) credits.
Basic principles of Occupational Health in the community, emphasizing the prevention and control of work accidents and illness. The following topics are included: Adverse Health Effect from Exposure to Excessive Noise, Vibration, Extremes of Temperatures, Radiations, and Chemicals. The epidemiologic aspects of work

accidents are covered. Techniques for organizing and developing occupational health programs are discussed. Emphasis is placed on legal requirements under OSHA.

SAAM 6526 - Principles Industrial Ergonomics. Three (3) credits. Pre-requisite: SAAM 6524.
The course will focus on the discussion of the ergonomic risks and their impact on employee well-being. The contemporary application of ergonomic as part of any industrial process will be presented. The student will analyze the human bio-mechanics model as it pertains to ergonomics. The anthropometric principles will be discussed. The most common musculoskeletal disorders related to poor ergonomic practices will be presented. The ergonomic risk factors and optimal workstation characteristics will be analyzed. Special attention will be given to material handling techniques. The evaluation and control techniques to manage ergonomics in the workplace will be discussed during classroom lectures and supplemented with practical exercises. The medical management of musculoskeletal disorders will be illustrated.

SAAM 6527 - Principles of Environmental Sciences. Three (3) credits.
The ecological principles such as natural cycles of various vital elements, energy flow, and energetic resources. The basic fundamental pollution problems will also be studied specially for the air, water, and soil environment: as well as the pollution control methods available to control such pollution problems. The student will also be expose to environmental problems from the work environment, industrial safety and hygiene, laws and regulations and other problems, waste management in residential areas will also be covered. Food production will be studied.

SAAM 6528 - Principles of Environmental Public Health. Three (3) credits.
Using a systematic approach, the external ecological environment with its biological, physical, chemical components, and the effects of its interaction with other systems on public health, is studied. Through interactive lectures, group discussions, and case studies, the main exposures to environmental hazards that affect human and public health, including climate change and natural disasters; current methods for environmental monitoring; environmental risks assessment; and risk communication, are studied. Examples of environmental policy at the national and international levels, ethics and evidence for policymaking considered, and its impact on public health, are also discussed. public health students are expected to apply the acquired knowledge in environmental health to promote health and human wellbeing.

SAAM 6529 - Seminar on Environmental Health. One (1) credit.
Actual problems related to environmental pollution and control, reading, and reports on recent advances in environmental health.

SAAM 6530 - Environmental Planning. Four (4) credits. Pre-requisites: MEDU 6500, SAAM 6527 or SAAM 6528.
Techniques used for planning projects, land use, and resource use compatible with environmental health will be studied. It includes a practical application of the planning theory discussed in the course.

SAAM 6531 - Aquatic Systems and Public Health. Three (3) credits.
This course present to environmental health specialty students the environmental aspects of aquatic systems and their impact to public health. Through interactive lectures and group discussions students will analyze resources such as water and coastal resources as the most precious resources for public health, well-being and their environment. Students will participate in a field trip to understand the connections among aquatic systems and public health with a socio-ecological approach as an experiential learning activity. At the end of the course, students are expected, apply appropriate knowledge and propose solutions to problems influencing health, water and aquatic ecosystems.

SAAM 6533 - Environmental Radiation. Four (4) credits.
The environmental health aspects of nuclear radiation. Evaluation of the significance of the uses of nuclear energy. Medical and industrial uses of radionuclides in relation to environmental processes. Methods of control of radionuclides in the environment. Considerations of biological uptake and movement of the radionuclides in the environment. Rationale of regulatory standards for air, water, milk, and their limitations.

SAAM 6534 - Air Pollution and Public Health. Three (3) credits.
This course describes the fundaments for examining the link between air quality and human health effects. It presents an overview of the problem of air pollution and discusses the main air contaminants with their sources, effects and fate and transport process in the atmosphere. Through interactive lectures and group discussions, the course provides students the opportunity to become acquainted with ways to characterize air pollutions as well as its public health implications based on recent epidemiological or toxicological research. The course covers the main mechanisms, and existing public policies and regulations for air pollution control, as well as an introduction to climate change and its effects on public health. At the end student will be able to examine air pollution as a major environmental public health risk.

SAAM 6535 - Environmental Toxicology. Three (3) credits.
The course introduces students to the environmental toxicology field that study the adverse health effects caused by environmental pollutants. It covers absorption, distribution, metabolism, and excretion of environmental chemicals, and describes the disposition of chemicals in the organisms and how it affects toxicity. Students will learn examples of the major environmental chemical substances and about mechanisms of toxicity. Through interactive lecture and in-class exercises students will examine methods to measure exposure, susceptibility and toxicity to these chemical and interpreted toxicology data. at the end, students will critically evaluate public health issue related to environmental hazards to characterize their effects in the ecosystem and in the population health.

SAAM 6536 - Readings in Environmental Health. Two (2) credits.
Supervised readings and discussions of selected problems in various aspects of Environmental Health.

SAAM 6537 - Readings in Environmental Health. Three (3) credits.
Supervised readings and discussions of selected problems in various aspects of Environmental Health.

SAAM 6538 - Readings in Environmental Health. Four (4) credits.
Supervised readings and discussions of selected problems in various aspects of Environmental Health.

SAAM 6539 - Computer System Applied to Environmental Health. Four (4) credits.
Techniques of system analysis and mathematical modeling for formulating and solving problems of environmental interest. An introduction to Fortran programming, linear, and nonlinear programming and other techniques and tools used in system analysis.

SAAM 6540 - Solid Wastes Management. Three (3) credits.
It includes topics on solid wastes environmental pollution and its control, reuse of resources, possible solutions to the problems and some aspects of environmental planning.

SAAM 6541 - Laws and Environmental Health Protection. Three (3) credits.
The course introduces students to the legal issues related to the management of pollution control and other environmental factors that affect health. The functions and interaction of courts, legislatures, regulators and their role in environmental health policy will be discussed. Using interactive conferences and group discussions, students will analyze the environmental law, political rights and administrative law principles applied of the clean air act the clean water act, RCRA and CERCLA will be studied. And the end of the course

the student will apply the constitutional right, the principles of the general environmental law, and the existing regulations to a public health situation.

SAAM 6542 - Accident Prevention. Four (4) credits.
The epidemiological evaluation of industrial home and traffic accidents. Legislation of safety programs including hazard recognition. Analysis and control.

SAAM 6543 - Industrial Hygiene. Three (3) credits.
Basic concepts of Industrial Hygiene. The relation between health, safety, and well-being of the employees in relation to the working environment. The industrial and government services dealing with these problems is studied.

SAAM 6544 - Radiological Health. Four (4) credits.
Radiation physics, radiochemistry, radiobiology, and radiation detection. Emphasis on methods of protection against radiation hazards on occupational and other environmental aspects. Control and disposal of radioactive wastes, legal aspects, and administration of Radiological Health Programs.

SAAM 6545 - Food Hygiene. Three (3) credits.
The course provides to students the knowledge and skills to integrate administrative and scientific fundamentals in public health, microbiology, and sanitary control to achieve food safety. The course allows students to offer solutions to improve public health in order to prevent food-borne diseases. Through interactive lectures and group discussions, students will discuss concepts, rules and regulations in food safety, sanitary quality of a food product and epidemiological procedures and techniques regarding the investigation of food-borne outbreaks. Also, students analyze public health problems associated with food safety and its relationship with existing public health policy. It is expected that students evaluate different courses of action for the solution of food safety problems.

SAAM 6546 - Occupational Medicine. Three (3) credits.
It includes the study of physician responsibilities under OSHA, the prevention of occupational health hazard, and the diagnosis and management of the most common occupational diseases. Emphasis is given to the development of skills in Toxicology and Epidemiology which are applicable to Occupational Health Programs. Medical monitoring techniques are discussed in conjunction with the physical examination program. Basic administrative aspects including the design and equipment of a medical department are discussed. The study of the Health Care System for handling occupational injuries and illnesses in Puerto Rico is covered.

SAAM 6547 - Basic Principles in Occupational Safety. Three (3) credits.
This course offers the student the opportunity to develop his knowledge of the occupational safety field. The course includes the study of the laws dealing with health and safety in the United States and Puerto Rico. The origin and development of safety practices will be discussed and the terminology used in the accident prevention and accident investigation field will be analyzed. During the course, the importance of compilation of data in occupational safety and their statistical analysis will be stressed. Visits to working areas will be programmed so that the students can apply concepts learned in the course. Particular emphasis during the visits will be offered to risk determination, corrective procedures, fine prevention, and inspection of work surfaces.

SAAM 6548 - Industrial Hygiene Laboratory. Two (2) credits.
This course will offer the student the opportunity to learn the theoretical basis of operation of industrial hygiene instruments, their calibration and use. The emphasis will be upon the importance of calibration, the sampling techniques and the statistical analysis of sampling data. This course is a must for students who

desire a concentration of courses in Occupational Health. Only ten (10) students will be accepted per trimester per section in order to optimize the use of available equipment and increment communication.

SAAM 6549 - Occupational Health for Nursing Personnel. Four (4) credits.
This course will offer the student nurses, and nurses already working in industries the opportunity to improve knowledge and develop skills in the application of nursing principles in Occupational Health. The basics concepts of Occupational Health are the base to introduce the nurse in this specialized field. Principles of industry hygiene, safety and accident prevention are covered. The legal aspects and requirements under OSHA with emphasis on nurse's responsibilities are prevented. Emphasis is placed on the application of the nursing process to the Occupational Health Programs especially in the implementation of nursing services. The wide scope of occupational health nurse role covered, like administrative tasks, counseling, and health education.

SAAM 6550 - Basic Principles in Occupational Safety II. Four (4) credits.
During this course the student studies the justification for the development of health and safety program. The activities, functions, and budget of such program will be discussed. The guidelines related to the control of the physical environment, accident prevention, fire extinguishing, and traffic safety will be examined and practiced. Visits will be performed to work places with the purpose of determining violations to the safety regulations and to establish corrective procedures.

SAAM 6551 - Occupational Medicine. Three (3) credits.
Includes study of physician's responsibilities under OSHA and OSHO, occupational health hazards and diagnosis, and management of most common occupational disease in Puerto Rico. Emphasis in Toxicology and Epidemiology. Biological monitoring of employees, administration of program and Occupational Health Care Delivery Systems in Puerto Rico are covered.

SAAM 6555 - Introduction to Hydrology. Four (4) credits.
The course provides an overview of applied Hydrology following case studies in Puerto Rico. It includes topics on Meteorology, Geology, Surface Waters, Floods, Low Flows, Water Quality, Limnology, Ground Water Hydraulics, Aquifers, Water Resources Management, and Water Law.

SAAM 6565 – Chemical Risks Control. Three (3) credits.
Principles and application of different methods and technology for controlling health hazards at work places.

SAAM 6566 - Field Studies of the Workplace. Two (2) credits. Pre-requisites: SAAM 6543, SAAM 6547, SAAM 6548, SAAM 6565.
This course consists of various field trips to different workplaces and discussions where students will be able to familiarize with specific industrial processes or activities and their associated health hazards. The student will analyze these workplaces based on the principles of anticipation, recognition, evaluation, and control of occupational hazards. Visits will include different workplaces that represent different occupational health hazards such as noise, chemical, ergonomics, biological, and radiation. Students will present a written report of their findings and analysis.

SAAM 6567 - Management Tools for Industrial Hygienists. Three (3) credits. Pre-requisite: BIOE 6525.
This course aims at providing students of the industrial hygiene program with some important management tools that are required from industrial hygienists for their effective participation in the decision-making process of modern industry. The course curriculum covers: a) the theoretical and practical aspects of the strategy proposed by the American Industrial Hygiene Association (AIHA) for the assessment and management of occupational exposures; b) the application of engineering economics principles for the justification of OEHS controls; and c) principles of continuing improvement used in modern manufacturing

systems. The course also provides the opportunity for students to learn and use MS excel statistical and financial tools. The course requires the use of a laptop with MS Excel installed at all meetings.

SAAM 6568 - Laws and Regulations Applied to Occupational Safety. Three (3) credits.
In this course the fundamental concepts of occupational safety laws, standards, and regulations, as well as important aspects leading to the prevention of incidents and accidents are studied. The code of federal register 29 (cfr) and international standards such as those published by the international standards organizations (iso) are used as base to establish/assess compliance towards protecting workers against occupational risk factors. Moreover, class discussions are directed towards the role of the environmental health and safety specialist pertaining the development and application of laws and regulation and control of chemical, physical, and biological hazards in the workplace. Finally, case studies are used to evaluate laws, regulations, and standards, as well as to evaluate the effectiveness of social media technologies as surveillance and audit tools.

SAAM 6570 - Response and Preparation for Emergencies and Hazardous Operations. Three (3) credits.
The course introduces the Master in Science in Industrial Hygiene student to the fundamentals of emergency management and fire protection. Through interactive lectures, group discussions, presentations, readings and projects, the student will analyze issues related to recognition, prevention and response to emergency situations in work environments, such as: fires, accidental emissions of hazardous materials, and floods, among others. The analysis of the work environment will be studied as a system in order to identify conditions that can generate an emergency situation, and to discuss the tools available for an industrial hygienist to respond to emergency situations. The student will learn the legal requirements regarding emergency prevention and handle of situations to effectively identify, prevent, respond, and coordinate efforts of emergency management with government agencies.

SAAM 6571 - Research Topics in Occupational Epidemiology and Health. Three (3) credits. Pre-requisites: EPID 6523, BIOE 6525
Main objective in this course is to allow masters students in the industrial hygiene program to acquire knowledge and skills required for their scientific evaluation of health problems related to their workplaces and occupational tasks. Students are expected to develop skills in the use of scientific methods to evaluate, design, and justify interventions, and establish strategies for the prevention of industrial hygiene risk factors. The course addresses basic occupational epidemiology principles through discussion and comparison of research articles focusing on health issues in workers. It also discusses the application of scientific research methods that allow students to answer questions regarding prevention and control of occupational injuries and illnesses.

SAAM 6572 - Design of Controls in Ergonomics. Three (3) credits.
The course is addressed to students in the master in sciences in the industrial hygiene program, and its aim is to develop skills in the analysis and design of mechanisms for the prevention and control of ergonomics risk factors in order to mitigate situations that may cause occupational injuries using practical experiences and real work situations, students will apply skills such as team working, oral communication, and critical ergonomic problem solving in the field of industrial hygiene and occupational health and safety. Students will demonstrate their designing skills controlling ergonomics risk factors in an ergonomics charette format.

SAAM 6573 - Chemical Risk Laboratory. One (1) credit. Pre-requisite: SAAM 6548. Co-requisite: SAAM 6565.
This course is designed for students from the industrial hygiene program and presents theory and practical aspects regarding chemical hazard control and indoor air quality as it pertains to occupational health. Course content includes evaluation of indoor air contaminants, such as, carbon monoxide and bio aerosols; general and local ventilations systems monitoring; and qualitative and quantitative respiratory protection fit testing. Instructional strategies include classroom discussion, laboratory exercises, field studies focused on modern

workplace assessment methods for ventilation systems and respiratory protection. Since course delivery includes diagnostic techniques for ventilation systems performance and respiratory fit testing techniques used in general industrial hygiene, some of the laboratory sessions will be held at the wind tunnel laboratory facility at the University of Puerto Rico Cayey Campus.

SAAM 6600 - Domestic and Industrial Wastes. Four (4) credits.
The basic physical, chemical, and biological principles used in sewage treatment. The mayor treatment systems are presented and analyzed. Federal and state water pollution control laws are studied. Other mayor topics included are Sewage and Industrial Wastes Sampling and Analysis, Tertiary Treatment, and others. The Water Environment is a prerequisite.

SAAM 6601 - Water Pollution Control. Four (4) credits.
Specific water pollution control methods and techniques. Principal topics include: Water Bacteriology; Effects of the Aquatic Community on the Nutrient Cycles; Mathematical Models of Water Pollution and Controls; Stream and Coastal Water Pollution Control, and others, The Water Environment, Domestic and Industrial Waste Treatment and Potable Water are prerequisites.

SAAM 6602 - Potable Water Treatment. Four (4) credits.
The Basic Principles of Water Treatment, Reservoir and Water Resources Management, and Potable Water Distribution Systems are included among the top topics. Potable water laws and regulations are studied, both of state and United States level.

SAAM 6603 - Water Chemistry. Four (4) credits.
The Effects of Chemical Composition of Stream and Subsurface Water on the Ecology of Water System, The Various Reactions which commonly take place in Water Systems, The Limitations on Uses Imposed by Chemical Substances Dissolved in Water, Equilibrium Reactions of the Most Important Ions and The Chemical Composition of Natural Waters are the mayor topics in this course.

SAAM 6604 - Water Pollution Contamination. Four (4) credits.
Sources of air pollution and effects, control measures, the organization of community control programs. Regulatory aspects and standards are discussed.

SAAM 6605 - Meteorology in Air Pollution. Four (4) credits.
Effects upon the dispersion of air pollutants due to meteorologic changes. Mathematical models describing the concentration of pollutants as a function of source strength and meteorological changes will be used.

SAAM 6606 - Sampling and Analysis in Air Pollution. Three (3) credits.
The theory and application of the analysis of samples, calibration of equipment and site selection, calibration, and use of direct reading instruments.

SAAM 6607 - Food Processing. Three (3) credits.
Detailed study of product development including packaging, waste disposal, plant layout, cost estimation and analysis using the case study approach. Classes include guest lectures from industry and public agencies.

SAAM 6608 - Food Establishment Sanitation. Three (3) credits.
Principles and practices in the supervision of foods. Emphasis on equipment and techniques for the preparation, preservation, and storage. Special attention is given to the inspection of food vending establishments.

SAAM 6609 - Milk and Milk Products Hygiene. Three (3) credits.
Principles and practices in the sanitation supervision of the production, manipulation, pasteurization and transportation of milk and milk products. Includes regulations, inspections and control measures, their application legal and education aspects.

SAAM 6610 - Radiation Biology. Four (4) credits.
A general course in Radiation Biology designed to acquaint the student with the effects of radiation on living matter including elementary forms of life and higher organisms as well, dose-effect relationship, target theory, and linear energy transfer temperature, and oxygen effect. Biological effects of radiation on a mammal or human from the physiological and pathological point of view. Special emphasis is placed on dose-effect relationship, effects due to acute and chronic exposures, radiation, sickness and late effects, etc.

SAAM 6611 - Radiochemistry. Four (4) credits.
Natural radioactivity, laws of radioactive decay, and cosmic radiation are discussed. Special emphasis is placed on environmental sampling and low level counting techniques. Radio assays of air, water, soil, vegetation and milk samples are included.

SAAM 6612 - Radiation Dosimetry. Four (4) credits.
The theory, methods, and techniques applied to measure radiation doses are discussed. Special emphasis is placed on the measurements of absorbed dose. All types of sources producing radiation are included. The course is designed to familiarize the student with the different kinds of known dosimeters and their applications.

SAAM 6613 - Radio Pharmacy. Four (4) credits.

SAAM 6614 - Nuclear Reactor Technology and Safety. Four (4) credits.
A course intended to acquaint the student with present reactor development. Fission and chain reactions, elements of reactor design, utilization of nuclear energy for power, and radiation problems are included. The student is acquainted with the fundamental in the controlling of the nuclear chain reaction. Special circuits and safety devices are emphasized. The course includes visits to nuclear reactors.

SAAM 6615 - Nuclear Instrumentation. Four (4) credits.
This course is designed to familiarize the student with the principles, methods, and practices of radiation detection. Emphasis is placed on the physics of counters (gas-filled detectors, scintillation detectors, solid-state detectors) and their applications in detecting Alpha, Beta, Gamma, and neutron radiations.

SAAM 6617 - Statistical Methods for Environmental Sampling and Data Analysis. Four (4) credits. Pre-requisites: BIOE 6525, SAAM 6528, SAAM 6531 or SAAM 6534.
The course will discuss statistical sampling designs for environmental pollutions and a wide variety of statistical procedures for analyzing environmental data including methods for handling correlated data for detecting hot spots, for estimating confidence intervals for quantiles, and the methods of time series analysis.

SAAM 6618 - Principles of Environmental Geology. Four (4) credits.
The geologic characteristics of soils and (geologic) structures will be studied and analyzed in this course mostly through conferences. Natural (geologic) phenomena, and man action's impacts on the environment as per its effects on geologic processes will also be studied. The students will learn to use, read, and interpret topographic and geological maps. The student will also learn to use aerial photographs as tools in environmental geology.

SAAM 6619 - Geographical Information Systems Applied to Environmental Health. Three (3) credits. Pre-requisite: MEDU 6500.
The primary purpose of this course is to provide the students of Public Health a basic working understanding of various geographic information systems (GIS) and their utility to conduct environmental health studies. It will provide an in depth appreciation on how to employ these systems to analyze social, environmental, and health information from a spatial and locational perspective. Upon completion of the course students will be able to prepare maps and employ aerial and satellite images in a variety of environmental health applications. The student will develop basic skills in the utilization of one of the most popular and available GIS software (ATLAS, ARCVIEW, ARCINFO). The course material will be conducted through conferences and computer exercises.

SAAM 6625 - Special Topics in Environmental Health. Three (3) credits.
Selected problems in the field of environmental pollution are discussed. Such ambient as air, water, and soil will be considered. Problems associated with housing, solid wastes, insects, rodents, and physical risks will be discussed. Special emphasis will be given to the role of education in the control of these problems.

SAAM 6626 - Laboratory Practices for the Analysis of Environmental Samples. Three (3) credits.
The objective of the course is to develop laboratory skills in the Environmental Health students for practices in methods for the analysis of chemical, physical and bacteriological parameters of water, air, foods, and others environmental samples.

SAAM 6627 - Principles of Industrial Hygiene. Three (3) credits.
The course will be offered to students of the Graduate School of Public Health who desire to obtain a general knowledge of Industrial Hygiene. The basic concepts of Industrial Hygiene will be established with particular interest in instrumentation. The following topics are covered: Concepts of Toxicology, Permissible Levels of Exposure, Concepts of Industrial Hygiene, and the topic Occupational Safety is introduced. Hospital health and safety is covered in certain detail.

SAAM 6635 - Introduction to Environmental Microbiology and Parasitology. Five (5) credits.
Through conferences and class discussions, the Environmental Health students will study the relevant aspects of the environmental microbiology and the parasitology. They will apply this knowledge in the control of the environmental contamination and the promotion of a better health.

SAAM 6636 - Occupational Toxicology. Three (3) credits. Pre-requisites: SAAM 6528. Co-requisites: SAAM 6524
The course presents an introduction on the field of occupational toxicology, the science that studies the adverse effects to the health, caused by chemical substances present or generated in the work environment. The study involves factors that determine how chemicals enter and affect the human body, types of chemicals and the typical industries that process of generate them, and their mechanisms of toxicity. The instructional strategies include lectures, review and analysis of scientific literature, classroom discussions, homework preparation and oral presentations. Students are expected to be aware of the toxic substances that are handled in work scenarios, their harmful effects on the body, as well as to critically analyze possible risk situations that may arise in the field of industrial toxicology.

SAAM 6695 - Research Project. Six (6) credits.
Research project dealing with a problem in Environmental Health.

SAAM 6696 - Industrial Hygiene Internship. Six (6) credits. Pre-requisites: SAAM 6543, SAAM 6547, SAAM 6548, SAAM 6565.
Students will spend three months (one quarter) in a field placement in industry, business company or a government agency. This practice will consist of one of the following alternatives: (1) active participation in the practice of Industrial Hygiene, (2) implementation of a practical study to solve an Industrial Hygiene problem, or (3) design of an Industrial Hygiene program for the selected site. Students will select the site of the internship with the advice of the faculty of the Industrial Hygiene Program. It is expected that at the end of the internship the student has integrated the knowledge and skills for the anticipation, recognition, evaluation and control of occupational health hazards.

SAAM 6995 – Applied Practice Experience: Environmental Health. Three (3) credits. Pre-requisites: Have approved all public health core courses and specialty courses.
This course is designed for graduate students of the Master in Public Health with a specialty in Environmental Health. The course provides students with an opportunity to demonstrate competency in the field of Public Health through an applied practice experience. The student will integrate and apply the knowledge and skills in a supervised practice experience to address a specific environmental health problem at a public health or environmental agency and/or community serving an organization. At the end of the course, students are expected to apply appropriate intervention activities to address the identified environmental public health problem and disseminate the field experience results.

SAAM 6999 – Capstone Project in Public Health Environmental Health. Three (3) credits. Pre-requisites: Have approved all public health core courses and specialty courses.
This course provides students of the Master in Public Health in Environmental Health with an integrating learning experience. It allows students to demonstrate their mastery of public health competencies. As part of the capstone, each student will submit a portfolio as evidence of the foundational and specialty competencies acquire during their studies. In this course, students are expected to generate a written product, which might include the following: training manual, policy statement, program evaluation report, review paper related to an important public health issue, a deposition before a legislative committee of the State Legislature with accompanying supporting research, among other integrative high quality project.

SAAM 8005 - Fundamentals of Environmental Health. Three (3) credits.
The course Fundamentals of Environmental Health has been designed for doctoral students, without a major in Environmental Health with emphasis in Puerto Rico. The course will be conducted by mean of general discussion of topics, case studies, and current issues in Environmental Health as well as problem solutions. It is expected the participation of the students in the discussion and it will gear around the water environment, air, soil pollution, and food hygiene from a public point of view.

SAAM 8006 - Environmental Physical Hazards. Three (3) credits.
The course is focused on the study of theories and principles of physics which apply to radiation, ionizing and non-ionizing. Those physical environmental risks such as electromagnetic waves will be studied. Emphasis will be given to radio frequency, sound, temperature, ultraviolet radiation, infrared and lasers. The biological effects and the applicable regulations to these risks within the context of Public Health will also be studied.

SAAM 8007 - Water Pollution. Three (3) credits.
This course examines the physics and chemistry of water from a Natural Sciences and processes point of view. It analyzes the transport of contaminants in surface water and the hydrogeology of groundwater in order to determine the best solution for the specific pollution problems of an area. Water quality modeling is used in order to gain a better understanding of the reasons behind the actual implementation of the Puerto Rico water quality standards. Priority is given to the study of the contamination of surface waters, drinking water, and wastewater, both from domestic as well as from industrial sources and its effects on Public Health.

SAAM 8009 - Hazardous Waste Management. Three (3) credits.
The course is focused specifically on the study of toxic chemical substances, which are generated and release into the environment as hazardous waste. The course will start by discussing the definition, origin, classification, and regulation of hazardous wastes. Methods utilized in the remedial process of hazardous waste such as management, treatment, monitoring, and health risk assessment will be later discussed. The students are expected to apply knowledge and skills learned, to determine approach, prevention, and solution to hazardous waste problems.

SAAM 8010 - Environmental Instrumental Analysis. Three (3) credits.
The course presents theoretical and practical aspects of sampling and analysis of water, air, and soil contaminants. It consists of the discussion of the methodologies used for the monitoring and analysis of environmental agents, laboratory exercises and field studies. Analytical techniques such as UV and visible spectrophotometry, atomic absorption, GC, GC-MS will be included in the course.

SAAM 8015 - Global Environment, Health, and International Law. Three (3) credits.
The course has the primary purpose to develop the philosophic, social, and scientific knowledge base and to facilitate the identification, analysis and solution of the global environmental changes currently threatening the planet earth. The course enables students to analyze social, legal, environmental and health information related to global warming, extraordinary climatic changes, destruction of the ozone layer, acid rain, deforestation, desertification, extinction of species, rise of sea level, contamination of the oceans, nuclear activities and the transportation of dangerous waste materials. The course also provides the students with an insight on the impact of these environmental problems on human health within the Caribbean region, particularly in Puerto Rico. Thus, the structure of the course helps the students to develop the capability to integrate global environmental information as part of the decision making process related to Environmental Health at the local as well as regional and international levels.

SAAM 8016 - Environmental Policy and Management. Three (3) credits.

This course provides students the knowledge and skills necessary to integrate legal, administrative, and scientific fundamentals in the analysis of existing environmental problems and to offer solutions. Existing environmental policies in Puerto Rico, the United States, and the world are discussed, as well as their effect on the control and prevention of environmental problems. In addition, various alternatives of environmental management to deal with environmental problems are discussed. Through interactive lectures and group discussion, students will analyze public health problems related to the environment in relation to the existing public policy. Students will evaluate the implications of alternative courses of action for the solution of problems of pollution and use of natural resources for the protection of public health and propose alternatives to improve the protection of environmental health.

SAAM 8017 - Health Risk Assessment. Three (3) credits.
This course describes the fundamentals of environmental health risk assessment, with emphasis on the estimation of health risks from environmental chemical substances. It covers the four essential steps of risk assessment (hazard identification, exposure assessment, toxicity assessment, and risk characterization) and discusses the uncertainties inherent in each step. It presents an overview of risk communication principles and its role in the risk management decision-making process. Through interactive lectures, group discussions, and case studies, the course provides students the opportunity to become acquainted with the risk estimation process for different environmental health hazards. Students will synthesize the acquired knowledge and skills by assessing the health risks of an assigned case study and delineating options to address them. The goal is to provide an understanding of how to use the risk assessment methodology in the regulatory decision-making process.

SAAM 8018 - Air Quality Management. Three (3) credits.
This course is designed for doctoral students from the School of Public Health. Three very useful and important components in the formulation of public policy and legislation regarding environmental air quality: (1) fate and transport of atmospheric pollutants, (2) dispersion modeling of contaminants, and (3) exposure assessment of air contaminants, will be discussed. These three components are presented and integrated from the perspective of management and policy of environmental air quality. The course will be offered through lectures, discussions, written exercises, and case studies. It is expected that students apply the knowledge acquired on appropriate air quality management practices.

SAAM 8020 - Current Environmental Health Issues. One (1) credit.
This seminar is designed to provide the students in the Public Health Doctorate Program essential scientific and social knowledge and understanding needed to identify, deliberate, analyze, and develop alternative solutions to current, significant, environmental issues and problems of primary interest at the moment. The course provides the means for the student to analyze Environmental and Public Health information related to ethical, technological, social, economic, and implementation strategies considerations associated with environmental issues. The course also addresses all aspects of the most controversial issues and event that impact on Public Health matters. In the beginning of the course current environmental problems are presented and discussed, then their relationship to Public Health matters are established, and finally, various solutions and implementation strategies are developed.

SAAM 8025 - Advanced Topics in Environmental Health. Three (3) credits.
This course consists of one independent work for doctoral students in a particular topic of their interest which was not covered in detail in the regular coursework. The student will review the current literature in a particular area guided by a faculty member. There will be periodic meetings between the student and the professor in charge of the course to discuss the progress of the work. At the end of the course, the student will prepare a written report about the topic studied.

SAAM 8026 - Integrated Management of Municipal Solid Waste. Three (3) credits.
This course is designed for doctoral students of Public Health. It is expected to train students in the use of the different options for the integrated management of the municipal solid wastes, and in the prevention of public health risks due to inappropriate management of the mentioned wastes. The discussed topics include: sustainable management of solid wastes, source reduction, reuse, compost production with the organic wastes, solid waste recycling, incineration, sanitary landfill design and operation, federal and state applicable laws and regulations, methodology for performing a non-hazardous solid waste composition study, public health risks, in addition to other topics. The course consists of lectures, group discussions and field visits.

SAAM 8027 – Environmental Public Health of Urban Communities. Two (2) credits. Pre-requisites: EPID 6523.
This course is targeted to doctoral public health students. Departing from the built environments of local urban communities the most relevant environmental agents and health inequities that affect the well-being of specific populations will be identified and analyzed using the community based participatory research (CBPR) method and system thinking approach. Students will analyze findings of the CBPR to propose recommendations of public health interventions on evidence based methods to prevent, control, manage, or mitigate environmental exposures and health inequities. The final product of the course will be a "Community Environmental Public Health Action Plan" developed through the interaction and discussion of the student's working group with local residents, community leaders, and policy makers. The Plan will be presented to the community and other stakeholders for their approval and support. The course framework of action are the low socioeconomic level urban communities.

SAAM 8118 – Prevention and Control Of Environmental Hazards: A Systems Thinking Approach. Three (3) credits. Pre-requisites: SAAM 8016, SAAM 8120, SAAM 8119.
This course is designed to provide students with an opportunity to demonstrate competency in the analysis and design of public health policies for the prevention and control of environmental hazards, including biological, chemical, and physical hazards. Through interactive lectures, group discussion and an applied evidence-based experience, students will select and analyze an environmental hazard in Puerto Rico, using systems thinking tools with holistic and reductional approaches. Also, students will apply policy analysis skills of selected environmental hazards. Students will be able to design a public health policy to address the whole hazard components based on the following guiding principles: environmental justice, polluter-pays principle, precautionary principle, the environmental sustainability principle, and health and sustainability in all policies.

SAAM 8119 – Exposure Assessment for Environmental Public Health. Two (2) credits.
This course, addressed to public health graduate students, describe the fundamentals of exposure assessment in public health with emphasis on environmental chemical substance. It covers the methods, measurements, tools, and models used to assess exposure, considering its variability and determinants (e.g. media, routes, timing of exposure). Through interactive lectures and group discussions, students have the opportunity to become acquainted with the exposure estimation process for different environmental exposure scenarios. Students will synthesize the acquired knowledge and skills by proposing an exposure assessment study to characterize potential risk. The goal is that students propose appropriate exposure assessment methodology in addressing environmental public health issues.

SAAM 8120 – Change Climate: A Public Health Response. Three (3) credits.
This course will examine some of the major consequence of climate change in our communities, such as: extreme events (life-threatening heat episodes, tropical cyclones, droughts, floods, and sea level rise), spread of infectious diseases and exacerbation of chronic disease, among others. The course will introduce the socio-ecological framework in the design of effective strategies to address these climate change impacts and to achieve sustainability goals. Through interactive lectures, and group discussions, students will be able to better understand, analyze and design solutions to the implication of a changing climate through a broader, integrative, resilient, and sustainable perspective. Student will understand climate change impacts on socio-ecological system and will integrate evidence-based research on environmental health to promote population health and well-being.

SAAM 8198 – Dissertation Proposal in Environmental Health. Three (3) credits. Pre-requisites: Have approved comprehensive exams.
This course is an Integrative Learning Experience for doctoral students of Environmental Health specialty. In this course, the student will demonstrate mastery in foundational and specialty competencies in the design of a research proposal that represents a theoretical and methodological contribution to public health practice in the environmental health area. The student presents the problem, research questions, and study methods as a proposal for approval of Dissertation Committee. Dissertation may take a variety of forms, and must generate a high quality written product consistent with advanced practice designed to influence programs, policies or systems addressing environmental public health. At the end of the course, students are expected to present in writing and orally a proposal for research project applying theoretical and methodological principles of environmental public health.

SAAM 8199 – Doctoral Dissertation in Environmental Health. Three (3) credits. Pre-requisites: SAAM 8198.
This course is an Integrative Learning Experience where doctoral students of Environmental Health specialty conclude the research dissertation. In this course, the student will demonstrate mastery in foundational and specialty competencies to generate a high-quality written product consistent with advanced practice designed to influence programs, policies or systems addressing environmental public health. The students

complete the implementation of a research proposal. The student will developed in the implementation of a research proposal that represents a theoretical and methodological contribution to public health practice in environmental health. Students will work under the guidance of the Doctoral Dissertation Committee. It is expected that students present the results of their research in writing and orally to academic and stakeholders; and generate a high-quality written product consistent with advanced practice in environmental public health area.

SAAM 8995 – Environmental Health Doctoral Research Seminar I. One (1) credit. Pre-requisites: SALP 8106.
The first part of an advanced research seminar is designed to facilitate the development of students' research ideas for dissertation and to contribute to further develop their communication skills. Through interactive lectures, group discussions, and independent study, the course centers on exposing doctoral students in environmental health to contemporary issues for the conceptualization of their research topic. In addition, it provides an overview of research methods applied to environmental health issues and of strategies used in the literature to translate research into practice and policy. At the end, students are expected to develop a concept paper with their research question, and the appropriate justification for conducting research in this area to translate results into public health practice and policy.

SAAM 8996 – Environmental Health Doctoral Research Seminar II. One (1) credit. Pre-requisites: SAAM 8995.
This course builds on the first doctoral research seminar. Through interactive lectures, group discussions and independent study, doctoral students in environmental health will continue the development their research ideas for dissertation and will strengthen their communication skills. The seminar focuses on the development of a literature review for the students' dissertation topic of interest, and emphasizes on the critical analysis of research methods applied to address environmental health issues. Students will lead presentation and discussion on specific research methods used for the study of their topic of interest. These discussions will enable them to explain, appraise and select appropriate research methods. Students are expected to formulate a preliminary draft of study design to address their research question for their research proposal.

SALP 6001 - Microcomputer Applications in Public Health I. Three (3) credits.
This course will focus on the development of skills to use microcomputers and application programs as tools to enhance the performance of the Public Health professional. Coverage will include the use of microcomputers and software applications widely used and specific for the health care field.

SALP 6005 - Foundations of Health Promotion. Three (3) credits.
This course is intended to provide graduate students with the fundamentals, strategies, and methodologies associated with the model of health promotion (HP). Emphasis will be given to the discussion of the conceptual framework, research, and practical experience of the movement of HP at local, national, regional, and global levels. Through interactive lectures, oral reports, and case studies students will learn the values and components of the HP such as equity, intersectoral, and determinants of health. Implications of the 2030 Agenda and the Sustainable Development Goals, policies and models of Health Promotion will be analyzed using real examples in public health. At the end of the course, the student is expected to propose actions for public health using the conceptual and methodological applications of PS to the Puerto Rican context.

SALP 6006 - Introduction to Public Health. Three (3) credits.
This is a hybrid online course with online micro learning techniques, and on-site public health case-study group discussions to provide students with foundational public health knowledge required for professionals in the field of public health. The course introduces theoretical concepts that guide practice in public health. It examines public health's philosophy, mission, history, functions, services, and health promotion models. It also introduces the biological, behavioral, social, and environmental determinants of health structured

around the ecological model of public health with special attention to present and future public health challenges. At the end of the course, students will be acquainted with the components of the public health system and appreciate the unique characteristics of public health practice as a social activity with an interdisciplinary approach.

SALP 6250 – Applied Public Health Research Methods. Three (3) credits.
Through case studies, analysis and group discussions, this course provides the students the opportunity to develop knowledge, and skills to address a public health issue for the design of a qualitative and/or quantitative research project. The course emphasizes formulating a public health research problem, contextualizing the problem in a theoretical framework and the importance of proper research designs, measuring basic concepts (e.g., questionnaire development, scale construction), sample selection and a data analysis plan. It is expected that students will develop skills in; performing adequate data analyses and interpreting qualitative and/or quantitative information using the appropriate software. At the end of the course, students will demonstrate the acquired knowledge and skills by writing a concept paper, and technical report addressing a public health issue.

SALP 6251 – Leadership in Public Health. Two (2) credits.
This course focuses on empowering graduate students to challenge the process, develop collaborations, and demonstrate competencies for the social development of public health services to improve community well-being. Students will apply leadership principles to public health practice and learn skills to perform in leadership positions. Students are expected to maximize their leadership skills through applied exercises, reflection, and practice. During the course, students will participate in face-to-face, synchronous or asynchronous sessions, literature review, group discussions, among others. Students are expected to demonstrate the leadership skills necessary to work effectively with a diverse workforce, diverse communities, and propose leadership strategies for public health practice. The course will be offered in in-person or hybrid modality.

SALP 6500 - Medical Background. Three (3) credits.
Study of the basic principles of structure and functioning of the human organism and of the human organism historical data, causes of disease, disturbance of the circulatory system. Inflammation, immunity and hypersensitivity, infections, parasites, neoplasms, radiation, hereditary diseases, and the medical terminology related to these topics.

SALP 6501 - Medical Terminology. Three (3) credits.
Study of the anatomical and physiological principles of the systems of the human organism and of the principal diseases that affects them. Includes the study of the medical terminology related to these systems.

SALP 6515 - Education for Woman and Her Family: Pregnancy and Childbirth, Healthy and Safe. Three (3) credits.
The course is intended to train mother and child health professionals to provide adequate information to women in order to motivate them to make informed decisions about their pregnancy and childbirth; and enabling them to have a satisfactory and healthy experience for them and their sons and daughters. Education and practices of pregnancy and childbirth should be based on the best and most active scientific evidence available. The course integrates evidence-based practice as a research strategy in childbirth education. The course will be offered completely online and is aimed at the professional who attends topics related to the health of the mother and childhood.

SALP 6520 - Public Health Field Laboratory. Six (6) credits.
The students are divided into multidisciplinary teams in order to carry on a health assessment of a community using relevant information such as: morbidity, specific health problems, political, sociocultural, educational, economical, and environmental factors. Using biostatistics and epidemiological technics the students obtain information that is not available in the community. With this information they design a health program and compare it with the current health programs going on in the community. They identify differences and its rational. Finally, the teams make recommendations.

SALP 6546 - Legal Aspects of Public Health. Three (3) credits.
This course presents the basic knowledge about political structure and the organization of the governmental system with emphasis on those organisms that are responsible for the implantation, observance, and interpretation of the constitution, law, and bylaws related to health of the country. It also, includes the importance of the law as a tool in the development and implantation of a health program, be it preventive or for the solution of health problems. The course brings to the attention of the student the world health problems, their legal aspects and how the law can help in their solution.

SALP 6583 - Applied Quantitative Methods. Three (3) credits.

SALP 6584 - Administrative Aspects of Health Programs. Four (4) credits.
This is a course for students of the Environmental Health Program. It is aimed to the analysis and study of the development and content of administration and organization as a discipline and as a process, with emphasis on the latter, as applied to both the governmental and the private sectors, especially to the health industry in general and to environmental health in particular. Basic theories of the administration process as well as its different functions, methods, and techniques will be studied and applied to Environmental Health. Substantive problems in the health services industry from the economist point of view. The characteristics of the marketing of the health services will be examined to determine the necessary public policy to insure its efficiency. Topics related to the micro and macroeconomics of health such as the demand and supply for health services, its industrial organization, and its introduction to the efficiency. An introduction to the analytical instruments used in the health industry, such as cost-benefit analysis, programming models, prediction, and public policy models will also be discussed.

SALP 6585 - General Considerations of Natural Disasters. Three (3) credits.
This course will provide the students general information and knowledge for the preparedness and management of different types of natural disasters. Topics such as: Effects of Disasters in Health, Procedures, and Organizations of Health Systems during Disasters, Epidemiological Surveillance, Preparedness for Disasters Situations, Assistance from External Organizations, will be discussed. The course has been designed for health professionals enrolled in the Master in Public Health Program and the other master programs offered in the school. The course is designed to provide knowledge and skills in handling different types of natural disasters. The student is expected to be able to design an

SALP 6587 - Clinical Management of Sexually Transmitted Diseases. Eighty (80) hours.
The course discuss the clinical management of the most common sexually transmitted diseases in Puerto Rico using lectures, demonstrations, and practical instruction.

SALP 6601 - Foundations of Maternal and Child Health. Three (3) credits.
This course is geared to Public Health students and is offered online. Fundamental aspects of maternal and child health are discussed, with emphasis on the social, economic, cultural, demographic and environmental issues. The history and actual structure of health programs are analyzed, as well as the public sector policies and private initiatives for women in the reproductive age, infants and children. The impact of various health programs for the different stages of the life cycle, and their functional results in terms of morbidity, mortality,

psychological welfare, reproduction, and growth are examined. The opportunity is provided for a critical evaluation on how health disparities, cultural, ethnic and socioeconomic factors impact access to health services for the maternal and child population, with the purpose of proposing modifications to the health care system to provide for their specific necessities.

SALP 6603 - Public Policy and Advocacy for Women, Children and Families. Three (3) credits.
This course discusses aspects related to the making of policies and advocacy for women, infants and families, with emphasis on the development of tools for the critical analysis for effective policies which serve as defenders of this population group. The political processes at the regional, national, federal and international levels is studied from the perspective of the roles and relations of the concerned groups in the development and implementation of public policies. The impact achieved by programs which offer health services to mothers and children supported by local and federal funds is analyzed. The opportunity is provided to propose a change in policy through work in advocacy in an organization involved with achieving a policy change. The course will be offered online and is geared to professionals who work with aspects related to maternal and child health.

SALP 6604 - Bioethical Aspects in Maternal and Child Health. Three (3) credits.
This course addresses the bioethical aspects related to maternal and child health from the main philosophies, principles, theories and ethical norms which are used as the basis for the solutions of public health policy debates. The ethical and legal principles of public health and clinical practice are discussed. The principles, values and ethical behaviors that support professional conduct in the health care system are recognized. By using case analyses ethical dilemmas and topics are identified which affect the population of mothers and children, to describe the ethical implications and solve problems ethically considering the community values and culture. The ethical, political and scientific implications of new developments in biotechnology are considered. The course will be offered totally online and is geared to professionals who work with aspects related to maternal and child health.

SALP 6605 - Human Lactation and Public Health. Three (3) credits.
The principal topics in the field of knowledge in human lactation and infant feeding are studied. The traditional national patterns and tendencies in infant feeding are analyzed. The student will have the opportunity of discovering the usefulness of evidence-based clinical practice for the development of strategies which lead to promotion, protection and support of breastfeeding. The formulation of public policies and legislation for the promotion, protection and support of breastfeeding, as well as advocacy strategies for its implantation are emphasized. Strategies of social marketing, education for adults and community education are analyzed in order to understand the needs of breastfeeding mothers, create new products and design programs for the promotion of breastfeeding. The course will be offered totally online and is geared to professionals who work with aspects related to maternal and child health.

SALP 6606 - Seminar on Maternal and Child Health. Two (2) credits.
Students in this course will have the opportunity to do research in a topic related to problems or situations which affect maternal and child health. The dynamics of the seminar strategy provides the student the opportunity to integrate knowledge and skills acquired in previous courses, and widen his point of view regarding maternal and child health dilemmas. Students will have the opportunity to demonstrate their abilities to communicate clearly through effective presentations, with knowledge of the maternal and child population, their needs and available services. Opportunity is afforded for students to capacitate other professionals through teaching among peers. The course will be offered totally online and is geared to professionals who work with aspects related to maternal and child health.

SALP 6995 – Applied Practice Experience: General Public Health. One (1) credit. Pre-requisites: Complete all MPH Core and Specialty Courses. Co-requisites: SALP 6997.
This on-site course is aimed at students of the Master in General Public Health Program. The course provides students with an opportunity to demonstrate applied theory, problem solving, and principles learned in the program to actual public health problems handled in professional environments through an applied practice experience. Organizations that could be practicum sites include governmental, non-governmental, non-profit, and for-profit settings. For the practicum experience, students will work under faculty supervision and collaborators in the site to conduct, implement and complete a defined meaningful project or intervention for the organization and to the advance of the public health practice with a presentation of observed needs, a reflective statement about their experience and lessons learned in Practicum. The Practicum may be carried in out-site Puerto Rico settings.

SALP 6997 – Integrative Experience in General Public Health. Five (5) credits. Pre-requisites: Complete all MPH Core and Specialty Courses. Co-requisites: SALP 6995.
This own site course provides students of the Master of General Public Health with an integrating learning experience. Students will be able to integrate and apply the skills and knowledge, theories, and principles learned to actual public health problems handled in professional environments. Under faculty supervision, students will work to conduct, implement and complete a defined project with measurable outcomes in one of the many areas of health policy, management or community health, making original contributions to that area. It is expected that students will apply the appropriate concepts, analyses and implications learned through the graduate program. At the end of the course, students will demonstrate the acquired knowledge and skills by writing a final technical report addressing a public health issue.

SALP 6999 – Capstone Project in Public Health: Epidemiology and Biostatistics. Five (5) credits. Co-requisites: EPID 6995.
This on-site course is aimed at students of the Master in Public Health with a specialty in Epidemiology or Biostatistics. The course provides students with an integrating learning experience that demonstrates the synthesis of foundational and specialty competencies acquired during their studies. Through the field experience in the study community, interdisciplinary practice, small group activities, discussion of readings, presentations, and reports, the different components of a previous research proposal designed are executed. Main activities include data collection, organization, management, processing, description, analysis, synthesis, and presentation; as well as interpretation of the results. At the end of the course, students are expected to formulate public health recommendations and interventions, likewise, dissemination of results.

SALP 8005 - Health Promotion Seminar. Two (2) credits.
Through the strategy of seminars and group discussions in the course theoretical-conceptual, operational and practical experience in the field of Health Promotion are analyzed. The course will present the main intervention strategies associated with Health Promotion at the community, institutional and structural levels. The relationship of conceptual and methodological articulation between Public Health and Health Promotion in the development of leadership and interprofessional social action is analyzed. The importance of health advocacy strategies, intersectoral policies and action, social and community mobilization, health education, and others is described. Trends and projections in the Promotion of Health in the local and international context are identified.

SALP 8006 - Doctoral Applied Practice Experience in Public Health. Zero (0) credits, 200 hours. Pre-requisites: All the fundamental and specialty courses of the doctoral program.
This practice experience offers doctoral students the opportunity to apply in a real world setting the theory, leadership, and problem-solving skills in an integrative manner. This 200-hour field experience is required to all students, regardless of prior work experience. The Practicum project will be designed so that the student has the principal responsibility, along with a team of collaborators in the site. Relevant organizations that

could be Practicum sites include governmental, non- governmental, non-profit, industrial and for-profit settings. At the end of course, student is expected to present a project that is meaningful for the organization and to the advance of the public health practice with a reflective statement about their experience and lessons learned in Practicum. The Practicum may be carried in or out-site Puerto Rico settings.

SALP 8007 - Bioethics and Public Health Practice. One (1) credit.
The present course has the teaching objective of sensitize, motivate, and enable health professionals to identify, analyze, and solve bioethical problems that may occur while conducting Public Health research or practice. In addition, the course is designed to help Public Health professionals learn the conceptual skills and abilities needed for the successful decision making related to bioethical issues present in Public Health. Throughout the course, health professionals will acquire the concept and principles of bioethics, will be able to recognize major bioethical issues, and also will familiarize themselves with the ethics involved in Public Health research and practice. Furthermore, it is intended that the health professional will master and apply the bioethical method in decision making related to Public Health issues and value the bioethical commitment present in Public Health. Bioethical issues and problems relevant to the different concentrations within the Public Health Doctoral Program will be selected and discussed in the present course. The bioethical method of decision making will be applied to these issues.

SALP 8015 - Doctoral Dissertation in Public Health. Nine (9) credits. Pre-requisites: Courses of First and Second Year, comprehensive test, internship.
The purpose of this course is to enable the student to develop or acquire such knowledge, skills, and attitudes as required for the development and implementation of a research project proposal that will result in improvements in Public Health practices, in his or her area of specialization. Each student will provide an oral presentation of the project and will actively participate in the conduct of the study, under the supervision of a doctoral dissertation committee. As a minimum, this committee will be constituted by one department faculty member (president), a statistician (if required), a specialist in the subject matter, and two reviewers. The course includes individual and group meetings and discussions with the dissertation committee, independent research and preparation of written materials.

SALP 8025 - Leadership Seminar. One (1) credit.
The purpose of the course is to analyze the principal leadership theoretical models and approaches and the application in the field of Public Health. The course analyzes the meaning of leadership in term of personal and professional development; and the social contribution of leadership in fostering the health services in Puerto Rico. The course includes practical experiences; public presentations, negotiation methods, development of proposals, and other strategies.

SALP 8026 – Public Health Leader as Educator. Three (3) credits.
This course is designed to train graduate students with knowledge, skills and attitudes required to integrate educational practices and strategies into their professional public health practice. The course will emphasize educational approaches for a range of audiences, systemic planning, and design of learning experiences. Current topics related to the educational process will also be discussed as the use of media and technologies of information to positively impact the process of teaching and learning. The student is expected to integrate and apply acquired concepts in the development of educational plan for intervention in academics, organizational or community scenarios.

SALP 8105 - Research in Public Health. Three (3) credits. Pre-requisites: BIOE 8005, EPID 8002.
This course aims to increase the student's skills and research knowledge to enable them to write their research project proposal. The requirements of the proposal are examined. The themes of problem conceptualization, research design, data-gathering techniques and data analysis are emphasized. The student will explore their topic of interest and will conduct a literature review, identification of the research design

and methodology appropriate to their research problem. This course is structured as to allow students the opportunity to present their work and obtain feedback.

SALP 8106 – Research Design Approaches for Public Health. Three (3) credits. Pre-requisites: EPID 8002.
The course provides students the opportunity to become acquainted with a variety of approaches to research design and advance their understanding of research through critical exploration of diverse paradigms, ethics, and their use in public health research. Through lectures, group discussions, independent study, and case study presentations, students discuss theoretical components and practical techniques for conceptualizing and designing research projects using quantitative, qualitative, mixed-methods, policy analysis, and evaluation methods to address health issues at multiple (individual, group, organization, community and population) levels. Articles published in scientific journals and chapters from the texts will guide the discussion encouraging active student participation. At the end of the course, students will bring together the acquired knowledge and skills by proposing different research methodological approaches in addressing a public health issue.

Faculty

ACOSTA-PÉREZ, EDNA – *Assistant Professor*; PhD, 2005, University of Puerto Rico – Río Piedras Campus.
ALBIZU-GARCÍA, CARMEN E. - Professor; MD, 1975, University of Puerto Rico - Medical Sciences Campus.
AGOSTO-VALENTIN, KAREN – *Adjunct Professor*; DrPH, 2022, University of Puerto Rico - Medical Sciences Campus.
AMAYA-ARDILA, CLAUDIA P. - *Assistant Professor*; EdD, 2018, University of Puerto Rico - Río Piedras Campus.
ARROYO-ACEVEDO, HIRAM V. - *Professor*; EdD, 1990, Interamerican University - Puerto Rico.
AYALA-COLON, ROSALIE – *Adjunct Professor*, MPHE, 2016, University of Puerto Rico - Medical Sciences Campus.
BONILLA-SOTO, LUIS A. - *Professor*; PhD, 1984, University of Puerto Rico - Mayagüez Campus.
BORGES-CANCEL, MARÍA T. – *Associate Professor*; EdD, 2013, University of Puerto Rico – Rio Piedras Campus.
BUSTILLO-HERNÁNDEZ, MARTA M. - *Associate Professor*; PhD, 1999, University of South Florida.
CAPORALI-FILHO, SERGIO A. - *Professor*; PhD, 2002, West Virginia University.
CARRIÓN-BARALT, JOSÉ R. - *Professor*; PhD, 1999, Caribbean Center for Advanced Studies - Puerto Rico.
COLÓN-COLÓN, MARCILYN – *Associate Professor*; EdD, 2016, University of Puerto Rico – Río Piedras Campus.
COLÓN-JORDÁN, HÉCTOR M. - *Associate Professor*; PhD, 2000, University of Miami.
DÁVILA-ROMÁN, ANA LUISA - *Professor*; PhD, 1987, Université de Paris - La Sorbonne, France.
DE OLIVIERA-PIMENTA, ALUISIO – *Assistant Professor; PhD, 2001, Rensselaer Polytechnic Institute, Troy NY.*
GARCÍA MELÉNDEZ, IVELISSE M. - *Professor*; EdD, 2008, University of Puerto Rico - Río Piedras Campus.
LABAULT-CABEZA, NIRZKA M. - *Professor*; PhD, 1999, University of Massachusetts.
LEÓN-LÓPEZ, LUZ E. - *Professor*; PhD, 1996, Fordham University - New York.
MANSILLA-RIVERA, IMAR - *Professor*; PhD, 2000, University of Michigan.
MARÍN-CENTENO, HERIBERTO A. - *Professor*; PhD, 1997, Wayne State University.
MARREO HERNÁNDEZ- ALIDA – *Adjunct Professor*, MPH, 2006, University of Puerto Rico - Medical Sciences Campus.
MATTEI-TORRES, HERNANDO A. - *Professor*; PhD, 1989, University of Texas.
MELÉNDEZ-ROSARIO, MARYTERE – *Assistant Professor*; DPT, 2023, University of Puerto Rico - Río Piedras Campus.
MÉNDEZ-LÁZARO, PABLO A. - *Associate Professor*; PhD, 2010, University of Salamanca - Spain.
NAZARIO-DELGADO, CRUZ M. - *Professor*; PhD, 1988, Johns Hopkins University.
NORAT-RAMÍREZ, JOSÉ A. - *Professor*; PhD, 1989, University of Michigan.
PARRILLA-RODRÍGUEZ, ANA M. - *Professor*; MD, 1986, University of Puerto Rico - Medical Sciences Campus.
PEÑA-ORELLANA, MARISOL - *Associate Professor*; EdD, Interamerican University - Puerto Rico.
PÉREZ DÍAZ, JOSÉ M. - *Assistant Professor*; PhD, 2010, University of Puerto Rico - Río Piedras Campus.
PÉREZ-CARDONA, CYNTHIA M. - *Professor*; PhD, 1994, Purdue University.
PEREZ-MATIAS, EDGAR – *Adjunct Professor*; DrPH, 2023, University of Puerto Rico - Medical Sciences Campus.
RAMOS-VALENCIA, GILBERTO - *Professor*; DrPH, 1990, University of Pittsburgh.
REYES-PULLIZA, JUAN C. - *Professor*; EdD, 2003, University of Puerto Rico - Río Piedras Campus.
RÍOS-MOTTA, RUTH E. - *Professor*; PhD, 1996, Johns Hopkins University.
RIVERA-GUTIÉRREZ, RALPH - *Professor*; PhD, 1991, Brandeis University.
RIVERA-SOTO, WINNA T. - *Professor*; PhD, 2000, Cornell University.
RODRÍGUEZ-FIGUEROA, LINNETTE - *Professor*; 2008, University of Michigan.

RODRÍGUEZ-SIERRA, CARLOS J. - *Professor*; PhD, 1995, University of Wisconsin.
ROSARIO-ROSADO, ROSA V. - *Professor*; DrPH, 2004, University of North Texas.
ROSARIO-SANTOS, ANGÉLICA – *Assistant Professor*; PhD, 2024, University of Puerto Rico - Río Piedras.
RUIZ-CORA, EDGARDO – *Associate Professor*; PhD, 2006, University of Pittsburgh.
SALAS-PAGÁN, CAROL – *Associate Professor*, PsyD, 2007, Carlos Albizu University – Puerto Rico.
SÁNCHEZ-CELADA, MIGUEL – *Assistant Professor*; PhD, 2016, Universidad Nacional de Educación a Distancia, España.
SÁNCHEZ-RODRÍGUEZ, RAMÓN E. - *Associate Professor*; MD, 1987, Central del Caribe University.
SANTIAGO-RODRIGUEZ, EDDA – *Adjunct Professor*; DrPH, 2018, University of Puerto Rico - Medical Sciences Campus.
VAZQUEZ-GUZMAN, YISELLY – *Assistant Professor*; EdD, 2016, University of Puerto Rico - Río Piedras.
VÁZQUEZ-TORRES, DHARMA - *Professor*; PhD, 2012, Walden University.
VÉLÉZ-VEGA, CARMEN M. - *Professor*; PhD, 2007, University of Puerto Rico - Río Piedras Campus.

SCHOOL OF HEALTH PROFESSIONS

MISSION AND GOALS

The School of Health Professions addresses the needs of the Puerto Rican community for qualified practitioners in a diversity of specialties within the health care field. The curricula provide the knowledge and skills and foster the necessary attitudes to carryout roles and functions within the health care team.

The School provides a wide variety of academic offerings leading to associate degrees, bachelor's degrees, post-bachelor certificates, master degrees, and professional doctorates. Most programs are designed for regular, full-time students, although some offer evening classes and part-time study.

The faculty is strongly committed to teaching, research in the allied health field, and community service. It provides clinical services to the public and professional consultation to hospitals, laboratories, and other organizations. Continuing education and specialized training are available to practicing health professionals. Through these activities, the School promotes and coordinates interaction among numerous educational and health agencies.

Academic programs are committed to the continuous curriculum development of their disciplines, research, and service delivery to the community, as well as interprofessional education. Through its academic programs, the School also emphasizes the development of critical thinking, social conscience, and ethical standards essential for all members of the health care team.

ORGANIZATION AND ADMINISTRATION

The School is under the direction of the Dean, with the support of the Associate Dean for Academic Affairs, and the Assistant Dean for Student Affairs. There are also offices of Administrative Affairs, Information and Educational Resources, Center for Advanced Studies in Medical Emergencies, and a Division of Continuing Education and Professional Studies. Academic programs are organized in two departments, Department of Undergraduate Programs and Department of Graduate Programs.

LOCATION AND FACILITIES

The School of Health Professions is located within the University of Puerto Rico Medical Sciences Campus. Student classrooms and laboratories, as well as administrative offices and community service centers, are housed in two buildings adjacent to the Guillermo Arbona Irizarry Building (Campus' main building). Academic programs that require a period of supervised practice coordinate these at hospitals, clinical laboratories, private clinics, schools, community health centers, and other health care facilities throughout the island and some areas of the United States.

For additional information about the Programs, please visit the School of Health Professions web page at http://eps.rcm.upr.edu/.

ASSOCIATE DEGREE IN DENTAL ASSISTING WITH EXPANDED FUNCTIONS

The Dental Assistant with Expanded Functions is a member of the oral health team. The Program provides training in chairside assisting techniques and expanded functions in basic restorative and preventive dentistry that enable students successfully perform as dental assistants with expanded functions (DAEF) in public and private sectors.

Upon completion of the Program, students receive an Associate Degree in Dental Assisting with Expanded Functions. This is a two-year program with seventy-four (74) semester credit hours. Students must complete the first year of general education courses at an accredited college or university (30 semester credit hours). Professional courses are taken at the Medical Sciences Campus during the second year of studies (44 semester credit hours).

Admission Requirements

The Program has a guaranteed transfer agreement with the University of Puerto Rico in Carolina Campus as long as the student complies with the established academic progress criteria.

Applicants to this program must present evidence of courses completion within the following areas at an accredited college or university. For specific courses within each subject, please contact the Program.

Required Courses	Semester Credit-Hours
Spanish	6
English	6
Social Sciences or Humanities	6
Biological Sciences	6
Mathematics	3
Electives	3
Total	**30**

Students who wish to be considered for admission to this program must also meet the following requirements:

- Obtain a minimum general grade point average of 2.00 in required courses.
- Have a grade point average of at least 2.00 in biological sciences and mathematics. Biological sciences and mathematics courses must be approved with a minimum course grade of “C” or above.
- Fluency in Spanish and, knowledge, and comprehension of English.

Graduation Requirements

In order to graduate, students must:

- Obtain a general grade point average of 2.00 or higher.
- Satisfactorily complete all didactic and clinical practice courses, as specified by the Program.

Accreditation

The Dental Assisting with Expanded Functions Program of the School of Health Professions is currently accredited by the Commission on Dental Accreditation, (CODA) of the American Dental Association (ADA), 211 East Chicago Avenue, Chicago, Illinois 60611. The Commission on Dental Accreditation phone number is (800) 621-8099, or (312) 440-4653. Website: www.ada.org/en/coda

ASSOCIATE DEGREE IN DENTAL ASSISTING WITH EXPANDED FUNCTIONS CURRICULUM

Total Semester Credit-Hours: 44
Professional Courses

AUXD 2017	Microbiology Pathology Therapeutics	3
AUXD 2015	Dental Oral Head and Neck Anatomy	3
AUXD 2025	Dental Radiology	4
PAXD 2017	Chairside Assisting and Basic Clinical Procedures	1
PAXD 2010	Introduction to General and Dental Specialties Procedures	2
PAXD 2016	Dental Instruments	2
PAXD 2015	Dental Materials	2
AUXD 2007	Oral Histology and Embryology	2
AUXD 2225	Practice Management, Ethics, and Jurisprudence	2
AUXD 2005	Anatomy and Physiology	3
PAXD 2029	Expanded Functions in Restorative Laboratory	3
PAXD 2018	Expanded Functions in Preventive Laboratory	2
PAXD 2101	Clinical Practice I	4
AUXD 2020	Psychology	2
PAXD 2030	Expanded Functions in Restorative Dentistry Clinic	3
PAXD 2102	Clinical Practice II	4
PAXD 2024	Expanded Functions in Preventive Dentistry Clinic	2

ASSOCIATE DEGREE IN RADIOLOGIC TECHNOLOGY

Note: The Associate Degree in Radiologic Technology program was placed on moratorium by certification 167 2023-2024 of the Government Board of the University of Puerto Rico. This program will not reopen.

ASSOCIATE DEGREE IN OPHTHALMIC TECHNOLOGY

The Ophthalmic Technology Program trains ophthalmic technicians theoretically and clinically to carry out technical functions, which this professional will perform under the direction and supervision of the ophthalmologist. Among its functions are to assist the ophthalmologist in the clinical area (diagnosis and treatment), surgical, and preventive areas to perform tasks such as taking a medical history to patients' and the execution of different diagnostic tests, both manual and computerized. The Program's objectives are mainly aimed at developing in the student competencies required in the field of the profession and to face the continuous changes that occur in society with the advent of modern technology in the field. Additionally, prepare trained professionals to work in an interdisciplinary team of visual care in various environments at the primary, secondary, and tertiary levels.

Ophthalmic technicians acquire competencies in developing knowledge and skills through the didactic and clinical components. The teaching curriculum integrates anatomical knowledge of the eye, eye procedures,

eye diseases, optics, ophthalmic equipment, ocular pharmacology, ethics, psychology, and surgical. The Ophthalmic Technology Program is a full-time program and lasts for one academic year. The academic year is divided into two (2) semesters and one (1) summer. Students are offered didactic courses with laboratories in the first semester. In the second semester, didactic courses and clinical experiences are offered. A wide variety of supervised clinical experiences are provided in different specialized and subspecialized clinical sites. In addition to academic experience, students are exposed to a variety of community service experiences and extracurricular activities to perform an educational and social role.

The Program is accredited by the International Council of Accreditation (ICA). Upon completing the Associate Degree, graduates can apply for the national Certified Ophthalmic Technician (COT) certification exam offered by the International Joint Commission on Allied Health Personnel in Ophthalmology (IJCAHPO). Ophthalmic technicians work in various settings, including the Department of Health, hospitals, private ophthalmic offices, outpatient ocular surgery centers. They provide services in any area of ophthalmological subspecialty.

Admission Requirements

Applicants from any of the units of the University of Puerto Rico System may request transfer within the deadline established by Registrar's Office. Students from private universities should submit the application in electronic format (application of admission at https://sistemas.rcm.upr.edu/admisiones/), within the deadline established by the program (Usually in March). For more information about specific deadlines, please contact the Office of Admissions of the Medical Sciences Campus, at 787-758-2525, extension 5211, 5213, 5214, 5215, 5228, 523 and 5231.

Applicants for admission to the professional program must:

- Complete 33 credits of required courses at an accredited institution in the areas stated below. For specific courses within each subject, please contact the program.

Required Courses	Semester Credit-Hours
English	6
Spanish	6
Humanities	6
Social Sciences	6
Biological Sciences	6
Mathematics	3
Total	**33**

- Minimum General Grade Point Average of 2.00.
- Have a Specific Grade Point Average of at least 2.00 in biological sciences and mathematics.
- Biological Sciences and Mathematics courses must be approved with a minimum course grade of "C" or above.
- Fluency in Spanish and knowledge and comprehension of English.
- Minimum interview score of 12.

Graduation Requirements

- Completion of program courses and clinical practice.
- Minimum grade point average of 2.00.
- Theoretical courses must be approved with C or higher grade and clinical practice with B.

Accreditation

The Associate Degree in Ophthalmic Technology Program of the School of Health Professions is accredited by the International Council of Accreditation (ICA).

ICA
2025 Woodlane Dr.
St. Paul, MN 55125

Phone: (651) 731-7243
Fax (651) 731-0410
International: +1 651-731-7243

ASSOCIATE DEGREE IN OPHTHALMIC TECHNOLOGY CURRICULUM

Total Credit-Hours: 39

Professional Courses:

TEOF 2010	Professional, Ethical and Psychological Aspects of the Ophthalmic Technician Profession	2
TEOF 2006	Ocular Anatomy and Physiology	4
TEOF 2007	General Concepts in Optics and Refraction	3
TEOF 2008	Ophthalmic Equipment	2
TEOF 2009	Ophthalmic Pharmacology	3
TEOF 2015	Diagnostic Techniques and Procedures	3
TEOF 2016	Common Eye Diseases, Trauma, and Emergencies	3
TEOF 2017	Ocular Surgery and Aseptic Techniques	3
TEOF 2025	Clinical Practice	16

Note: Students also participate in seminars on general anatomy and physiology, psychology, microbiology, and CPR.

BACHELOR OF HEALTH SCIENCES

The Bachelor of Health Sciences is an innovative, interdisciplinary, flexible program that provides a well-rounded education to persons holding associate degrees in health-related fields such as radiologic technology, ophthalmic technology, dental assisting, and others. It also provides them the opportunity to complete their studies towards a bachelor's degree. The curriculum aims to develop sensitive health professionals capable of delivering quality health care. This Program offered on 5 pm onwards (evening schedule).

Admission Requirements

In order to be considered for admission, applicants must comply with the following requirements:

- Hold an Associate Degree with at least 36 semester credits in a health sciences field.
- A grade point average of at least 2.00 in health-related courses.
- Satisfactorily complete courses in general education in the areas specified below at an accredited college or university. For specific courses, please contact the program:

Required Courses	Semester Credit-Hours
English	6
Biological Sciences	6
Spanish	6
Social Sciences or Humanities	6
Mathematics*	6
Total	**30**

* At the time of admission, the student must have 3 credits approved. The other 3 credits must be approved during the first year after admission to the program.

- Interview with the program's faculty.
- Fluency in Spanish, knowledge, and comprehension of English.

Graduation Requirements

In order to graduate, students must meet the following requirements:

- 36 credits in professional courses taken as part of an associate degree in the health sciences or health related fields.
- 30 credits in general education at an accredited college or university.
- 60 credits (26 credits in administration, 20 credits in interdisciplinary courses, and 14 credits in elective courses).
- 9 credits in others required courses
- Obtain a minimum overall grade point average of 2.00 and complete all area option courses with a minimum grade of C.

BACHELOR OF HEALTH SCIENCES CURRICULUM

Administration credits: 26 semester credit hours

CISA 4048	Basic Principles of Personnel Supervision	3
CISA 4031	Principles of Health Services Administration I	3
CISA 4032	Principles of Health Services Administration II	3
CISA 4035	Principles of Personnel Administration in Health Care Organizations	4
CISA 4065	Seminar and Practicum in Management	3
ECON 3005	Introduction to Economics	3
CONT 3005	Introduction to Elements of Accounting I	4
FINA 3006	Business Finance	3

Interdisciplinary Courses: 20 semester credit hours

INTD 4005	Health: A Holistic Approach	5+
INTD 4008	Trends and Controversies in Health Professions	3
INTD 4018	Gerontology: An Interdisciplinary Vision	3
INTD 4020	Introduction to Computers	3
INTD 4025	Microcomputers Applied to Health Sciences	3
INTD 5116	Incorporation Technology in Educational Activities	3

Others Interdisciplinary Required Courses: 9 semester credits-hours

CISA 4055	Statistical for Methods for Health Care Practitioners	3

EDSA 4008	Communication Skills	3
INTD 5006	Work Experience in the Interdisciplinary Health Team	3

Electives Course: 14 semester credit-hours

*These credits may be validated if taken at an accredited institution of higher education.

BACHELOR IN HEALTH EDUCATION AND HEALTH PROMOTION

The program offers a terminal professional baccalaureate. Its curriculum is based on developing academic-practical competencies in Health Promotion and Health Education. The health educator will be able to integrate their knowledge in health promotion, health education, public health, group and individual interventions, coaching, and health behavior into the work scenario or apply for graduate studies. Two academic years and one summer must be taken at the Medical Sciences Campus (MSC). The courses and community practical experiences are offered during the daytime, from Monday to Friday. The curriculum allows the students to work with topics, such as health promotion, health communication, social determinants of health, community health, design, implementation, and evaluation of health promotion and health education activities and programs, and health communication impact, among other topics and skills. Through the community practical experiences, the students will develop the professional roles of the health educator with an emphasis on group and individual interventions.

NOTE: This program is currently in the process of administrative and academic evaluation to be placed in a **moratrium status.** Contact the Program for further information.

Admission Requirements

To be considered for admission, applicants must meet the following requirements:

51 credits approved in the following courses, taken at an accredited institution of higher education, in or outside the country.

Required Courses*	**Semester Credit-Hours**
Spanish	6
English	6
Social Sciences	6
Biological Sciences	6
Human Development during Life Cycle	3
Human Biology or General Anatomy and Physiology	6
General Psychology	3
Mathematics (College Algebra)	3
Elective courses	12
TOTAL	**51**

* All the courses must be approved with a minimum grade of C, have a general index of 2.50 and a specific index of 2.75, plus a group interview with faculty members, fluency in Spanish, and knowledge and comprehension of English.

Graduation Requirements

To graduate, students must:

- Obtain a grade point average of at least 2.00.
- Complete the program's 124 credit hours.
- Complete the degree within 6 years.

BACHELOR IN HEALTH EDUCATION AND HEALTH PROMOTION CURRICULUM

Semester Credits: 60
Community Practices Credits: 13

EDSA 4020	Health Promotion	3
EDSA 4050	Communication for Public Health	3
EDSA 4051	Fundamentals of Interventions in Health Promotion and Health Education	3
CISA 4055	Statistical Methodology for Health Professionals	3
EDSA 4013	Educational Process in Health Promotion and Health Education	4
EDSA 4046	Introduction to Research	3
EDSA 4052	Practical Experience I: Public Health and the role of the Health Educator	2
EDSA 4154	Social Determinants of Health	3
EDSA 4047	Use of Technologies of Information and Communication in Health Promotion and Health Education	4
EDSA 4156	Individual Interventions in Health Promotion and Health Education	3
EPID 4201	Introduction to Epidemiological Methodology	3
EDSA 4155	Mental Health Promotion	3
EDSA 4158	Practical Experience II: Individual Intervention in Health Promotion and Health Education	2
EDSA 4157	Group Interventions in Health Promotion and Health Education	3
EDSA 4003	Practical Experience III: Group Intervention in Health Promotion and Health Education	2
EDSA 4014	Fundamentals in Planning of Health Promotion and Health Education Programs	4
EDSA 4401	Social Participation as a Strategy for Health Promotion and Health Education	3
EDSA 4403	Evaluation of Health Promotion and Health Education Programs	3
EDSA 4058	Sexual Health Promotion	3
EDSA 4402	Social Marketing	3
EDSA 4067	Priority Health Problems in Puerto Rico	3
EDSA 4059	Nutrition and Physical Activity	3
EDSA 4004	Practical Experiences IV: Intervention in Health Promotion and Health Education	7
TOTAL		**73**

BACHELOR OF SCIENCE IN VETERINARY TECHNOLOGY

The Veterinary Technology Program provides both classroom and clinical training in the areas of small and large animal care, food hygiene, veterinary hospital administration and laboratory animal science. It is a four-year Bachelor of Science degree in which students complete the first two years of education at any accredited university and the last two years at the Medical Sciences Campus. The American Veterinary Medical Association accredits the Program.

Veterinary technologists work primarily as professional assistants to veterinarians, biomedical researchers, and other scientists, and as such, are an integral part of the veterinary and public health care team. As the complexity of veterinary medicine increases and as the public demand for state-of-the-art care for animal's increases, the veterinary technologist plays a key role in the delivery of quality health care for animals.
Veterinary technologists perform a wide variety of duties, many under the supervision of a veterinarian. These tasks often include: nursing care of hospitalized patients, administering medications, performing a wide range of technical tasks, assisting in diagnostic and therapeutic procedures, collecting and analyzing clinical specimens, performing radiological and dental procedures, anesthesiology, and surgical assisting, office and hospital management, client counseling, and education. In addition to the above-mentioned tasks, veterinary technologists in biomedical research perform a major role in supervision of research colonies and facilities and assist in the design and implementation of research projects. They also aid in the diagnostic process, collection and analysis of data, and in the use of experimental and descriptive methods in epidemiological investigations in order to help prevent and control zoonotic diseases.

Admission Requirements

In order to be considered for admission, applicants must meet the following requirements:

- Two years of general courses and basic sciences courses as stated below. For specific courses within each subject, please contact the program.

Required Courses	Semester Credit-Hours
Spanish	6
English	6
Social Sciences	6
General Chemistry	8
General Biology	6
Organic Chemistry	8
Calculus or pre-calculus	4
General Physics	8
Statistics	3
Electives	9
Total	**64**

- Grade point average of at least 2.00 in all required courses.
- Grade point average of at least 2.00 in science and mathematics courses.
- All required courses must be approved with a minimum grade of "C".
- Interview with faculty members. Minimum interview score of 70%.
- Have a maximum of 12 credits in prerequisite work pending for the summer session prior to admission.
- Possess the physical and cognitive skills necessary to fulfill the responsibilities of the profession (Technical Standards).
- Fluency in Spanish, knowledge, and comprehension of English.

Applicants must have completed the required 64 credits or finish the requirements during the summer preceding the beginning of the program.

Graduation Requirements

In order to graduate, students must:

- Obtain a grade point average of at least 2.00.
- Complete the program's 130 credit-hours.
- Complete graduation requirements within 5 years.

Accreditation

The American Veterinary Medical Association accredits the Bachelor of Science in Veterinary Technology of the School of Health Professions.

AVMA
1931 N. Meacham Rd. Suite 100
Schaumburg, IL 60173-4360
Tel. 847-925-8070
https://www.avma.org/

BACHELOR OF SCIENCE IN VETERINARY TECHNOLOGY CURRICULUM

Total Semester Credit-Hours: 66
Professional Courses

SAAN 4036	Introduction to Animal Health Technology Science	2
SAAN 4026	Comparative Anatomy of Domestic Animals	2
SAAN 4027	Physiology of Domestic Animals	2
SAAN 4085	Introduction and Management of Farm Animals	6
SAAN 4059	Veterinary Microbiology	3
SAAN 4067	Principles of Veterinary Parasitology and Entomology	2
SAAN 4047	Introduction to Pharmacology	3
SAAN 4120	Animal Nursing	4
SAAN 4116	Veterinary Radiology	3
SAAN 4113	Veterinary Clinical Analysis I	3
SAAN 4101	Field Experience I	2
SAAN 4060	Animal Diseases	3
SAAN 4115	Laboratory Animal Management	3
SAAN 4078	Food Sanitation	4
SAAN 4114	Veterinary Clinical Analysis II	4
SAAN 4102	Field Experience II	2
SAAN 4069	Epidemiology and Zoonoses	3
SAAN 4105	Practicum-Animal Health Technology	6
SAAN 4029	Dog and Cat Nutrition	1
SAAN 4130	Veterinary Hospital Management and Computerized Records	4
SAAN 4125	Surgical Assistance	4

BACHELOR OF SCIENCE IN NUCLEAR MEDICINE TECHNOLOGY

Nuclear Medicine Technology is a health field concerned with the use of radiopharmaceuticals for diagnostic and therapeutic purposes, such as organ imaging, analysis of biological specimens, and therapeutic procedures.

The Bachelor of Science in Nuclear Medicine Technology program educates competent health professionals to perform nuclear medicine imaging procedures on patients, perform radioactive analyses of biological specimens, prepare and administer radiopharmaceuticals, and perform quality control procedures on instruments and radiopharmaceuticals. In addition, they prepare radionuclides for therapeutic procedures, and perform radiation safety procedures. The student entering the academic program receives education in performing General Nuclear Medicine, Nuclear Cardiology, Single Photon Emission Tomography (SPECT), Positron Emission, Tomography/Computed Tomography (PET/CT) and Bone Densitometry procedures.

The program consists of three years at a college or university majoring in natural sciences and a fourth year of courses in the specialty taken at the Medical Sciences Campus. The fourth professional year includes classroom theory and clinical practice.

Admission Requirements

Candidates for admission to the Nuclear Medicine Technology Program must present evidence of successful completion of at least three full academic years of work at an accredited college or university with a minimum grade point average of 2.50 (on a scale of 4.00), or its equivalent, in both science and general courses. This work must comprise not less than 99 credit hours, including the subjects stated below. For specific courses within each field, please contact the program:

Required Courses	**Semester Credit-Hours**
Spanish	12
English	12
Humanities	6
Social Sciences	6
Mathematics (including Calculus I)	11
Biology	12
General Chemistry	8
Analytical Chemistry	4
Organic Chemistry	8
General Physics	8
Electives	12
Total	**99**

Students who wish to be considered for admission to the program must also meet the following requirements.

- Obtain a general and specific grade point average in sciences and mathematics of 2.50.
- Be interviewed by faculty.
- Fluency in Spanish, knowledge, and comprehension of English.

Graduation Requirements

In order to graduate, students must comply with the following requirements:

- Completion of 135 credits, with a minimum grade point average of 2.00 or higher on a scale of 4.00.
- Satisfactory completion of all didactic and practical courses in the professional program.

Accreditation

The Nuclear Medicine Technology Program of the School of Health Professions is currently accredited by the Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT), 820 W. Danforth Rd., #B1, Edmond, OK, 73003; website: www.JRCNMT.org. The JRCNMT phone numbers are (405) 285-0546, Fax (405) 285-0579, e-mail: mail@jrcmt.org.

BACHELOR OF SCIENCE IN NUCLEAR MEDICINE TECHNOLOGY CURRICULUM

Total Semester Credit-Hours: 36

Professional Courses

INTD 4017	Biomedical Core Course	6
TENU 4135	Nuclear Physics	2
TENU 4177	Radiation Protection and Radiobiology	2
ANAT 4016	Topographical and Sectional Anatomy	2
TENU 4145	Statistics in Nuclear Medicine	1
TENU 4185	Radiopharmacy and Radionuclide Chemistry	2
TENU 4205	Instrumentation in Nuclear Medicine	2
TENU 4265	Nuclear Medicine Imaging	4
TENU 4195	Radioassays	2
TENU 4215	Administration of a Nuclear Medicine Facility	1
TENU 4235	Clinical Practice	10
TENU 4245	Computer Application in Nuclear Medicine	1
TENU 4225	Seminar	1

BACHELOR OF SCIENCE AND POST-BACHELOR CERTIFICATE IN SCIENCE IN MEDICAL TECHNOLOGY

Medical Technology is the study of the application of clinical laboratory analysis to the diagnosis or prevention of disease and to the monitoring of patient therapy. The program provides students with the knowledge and skills necessary to responsibly practice the profession. Students are also expected to develop a true sense of humanism and a professional attitude. The Program is fully accredited by the National Accrediting Agency for the Clinical Laboratory Sciences (NAACLS) until April 2031.

The mission of the Program is to prepare highly trained clinical laboratory scientists, qualified to practice as members of the healthcare team and contribute to the prevention, diagnosis and treatment of human disease in accordance with the emerging needs of the Puerto Rican community. The curriculum is designed to develop the cognitive, behavioral, and attitudinal skills required for technical, supervisory, consultative, and teaching roles in a variety of clinical or research settings.

Students are admitted into the professional program following a minimum of three years of undergraduate study. General requirements provide the basics of communication, math, critical thinking, social and ethical values. Prerequisite science courses establish the background knowledge necessary for the professional courses. Upon completion of the program, graduates qualify for a B.S. degree in Medical Technology or receive a Post-Baccalaureate Certificate, as appropriate.

The curriculum consists of two didactic semesters, offering the theory, knowledge and analytical skills in each major area of clinical laboratory science; and approximately eighteen (18) weeks of clinical practice, providing the opportunity to further develop and integrate the psychomotor, cognitive and attitudinal aspects of the profession. Graduates are competent in performing analytical tests on blood and other body fluids according to appropriate quality assurance standards, interpreting and reporting results, using modern instrumentation and methodologies, and applying the principles of management and education. Students are exposed to diverse educational/clinical experiences including practice rotations in hospital or private laboratory settings. The faculty are all highly qualified and licensed as general clinical laboratory scientists, with diverse academic preparations and experience as clinicians, supervisors, and educators. They are committed to continuing professional development through participation in professional organizations, attendance at national/international meetings and the pursuit of advanced degrees. Their continual awareness of emerging trends in healthcare is the framework for clinical service, consulting, education, and participation in legislative matters related to the profession.

All program graduates are eligible to take certifying examinations given by the Commonwealth of Puerto Rico or the American Society for Clinical Pathology Board of Registry (BOR). Upon licensure, they are qualified to work in hospital and private clinical laboratories, pharmaceutical/biomedical industries, research settings and others. As a valuable member of the healthcare team, the medical technologist must be academically and ethically capable of providing quality laboratory-related services.

Admission Requirements

Students who wish to be considered for admission to the program must also meet the following requirements:

1. 100 credits in general courses and basic sciences are required as stated below.
2. Grade point average of at least 2.50 in science and mathematics courses and in all required courses.
3. Have a maximum of 8 credits in prerequisite work pending for the summer session.
4. Possess the essential functions and capabilities necessary for an individual to carry out the responsibilities of the profession. The student must sign a form that certifies that possess the essential functions of the professions.
5. Fluency in Spanish and knowledge and comprehension of English.
6. Possess the necessary physical and cognitive abilities required by the profession.
7. Be interviewed by the faculty.

No transfer of credits or credits for experiential learning accepted. Applicants to the Bachelor's Degree Program must have completed three (3) years of study in an accredited higher learning institution. Applicants to the Post-Bachelor Certificate Program must present evidence of a Bachelor of Science degree from an accredited college or university.

Required Courses	**Semester Credit-Hours**
Social Sciences[1]	6
Spanish	12
College Physics	8
Humanities	6
English	12
Mathematics[2]	6
General Chemistry	8

Organic Chemistry	8
Analytical Chemistry[3]	4
Biology (which must include, microbiology or bacteriology, and immunology)[4]	16
Electives[5]	14
Total	**100**

1) Psychology courses are accepted
2) Introductory courses are not accepted
3) Quantitative Chemistry is not accepted
4) Must include general biology, microbiology or bacteriology, and immunology. Biology Sciences (CIBI) are not accepted as part of the biology credits
5) Biochemistry or cellular Biology are recommended

Graduation Requirements

In order for students to be recommended for the Bachelor of Science in Medical Technology or a Post-Certificate, in Science in Medical Technology, they must:

- Satisfactorily complete (with C or above) all didactic and clinical practice courses (54 credits).
- Obtain a general grade point average of 2.00 or higher in the 54 credits.
- Demonstrate the conduct and attitudes required in the performance of the profession.
- The granting of the baccalaureate or certificate degree must not be contingent upon any type of external certification or licensure examination.

Accreditation

The Bachelor of Science and Post-Bachelor Certificate in Science in Medical Technology of the School of Health Professions is accredited by the NAACLS - National Accrediting Agency for Clinical Laboratory Sciences, 5600 N. River Rd, Suite 720 Rosemont, IL 60018-5119. Phone (773) 714-8880, Fax (773) 714-8886. E-mail: info@naacls.org.

BACHELOR OF SCIENCE AND POST-BACHELOR CERTIFICATE IN SCIENCE IN MEDICAL TECHNOLOGY CURRICULUM

Total Semester Credit-Hours: 54
Didactic Courses: 42 semester credit-hours

TMED 4010	Introduction to Clinical Laboratory Science	1
ZOME 6503	Medical Parasitology	3
TMED 4001	Clinical Biochemistry I	4
TMED 4002	Clinical Biochemistry II	3
TMED 4021	Hematology I	3
TMED 4022	Hematology II	3
TMED 4140	Clinical Laboratory Administration	3
MICR 4006	Medical Bacteriology	7
TMED 4095	Urinalysis	3
TMED 4075	Clinical Serology-Immunology	3
TMED 4041	Immunohematology I	2
TMED 4042	Immunohematology II	2
TMED 4135	Principles and Utilization of Instrumentation in Clinical Laboratory Analysis	2

TMED 4150	Modern Concepts in Clinical Laboratory Sciences	3

Clinical Practice Courses: 12 semester credit-hours

TMED 4015	Clinical Practice in Biochemistry	3
TMED 4035	Clinical Practice in Hematology	3
TMED 4115	Clinical Practice in Bacteriology	3
TMED 4085	Clinical Practice in Serology	1
TMED 4106	Clinical Practice in Urinalysis/Parasitology	1
TMED 4065	Clinical Practice in Immunohematology	1

MUTIDISCIPLINARY BACHELOR IN RADIOLOGICAL SCIENCES

The radiologic technologist must possess multiple competencies in today's working world, including high technical and computed tomography skills, the ability to work in a team, and empathy and responsibility in patient care. In addition, the competencies require leadership, human resource management, teamwork coordination and quality in diagnostic processes. Radiologic technologists are an integral part of the interdisciplinary health care team. They promote the prevention and treatment of diseases through the correct use of radiation.

Upon completing the requirements of the multidisciplinary bachelor in radiologic sciences and obtaining a license from the Board of Radiologic Technologists in Diagnostic Imaging and Radiotherapy Technologists, the graduates can be employed in hospitals, imaging centers, medical offices, as specialists in application companies dedicated to the sale of radiographic equipment, among others. Also, in management positions such as supervisors or managers of a medical imaging departments. The curriculum is dynamic, allowing students to fulfill academic requirements on campus while practicing in affiliated public and private practice centers. The program is a four-year program in which the student completes 30 credits of general education at an accredited university during their first year. Professional courses include 86 credits in the areas of conventional radiology, computed tomography and management of radiologic services taken at the Medical Sciences Campus for three years. The program consists of 128 credits. The Program has two entry options. A basic option of 1:3 and an advanced 1.5 and 2 option.

Admission Requirements

Option 1:3

Applicants must have completed courses in the following areas with a general grade point average of 2.00 or higher, in a 0-4 grade point scale. For specific courses within each subject, please contact the program.

Required Courses	**Semester Credit-Hours**
English	6
Spanish	6
Humanities or Social Sciences	6
Biological Sciences	6
Mathematics	6
Total	**30**

Students seeking admission through this option must also meet the following requirements:

- Obtain a minimum grade point of average of 2.00 in required courses.

- Obtain a minimum grade point average of 2.00 in specific courses (biological sciences and mathematics).
- Attend an orientation session with faculty.
- Fluency in Spanish, knowledge, and comprehension of English.

Option 1.5 and 2

- The applicants must have obtained an associated degree in radiologic technology from an accredited institution.
- Must have a radiologic technologist state license active and in good standing.
- Have completed 30 credits in general education.
- Obtain a minimum grade point average of 2.00 in required courses.
- Obtain a minimum grade point average of 2.00 in specific course (radiological courses).
- Attend an interview with faculty program.
- Fluent in Spanish, knowledge and comprehension of English.

Graduation Requirements

In order to graduate, students must satisfactorily complete all didactic and clinical practice courses, as specified by the program. They must also have an overall grade point average in didactic courses and clinical experiences of at least 2.00.

Accreditation

The Multidisciplinary Bachelor's Degree in Radiological Sciences **is a susceptible program** for accreditation under the Joint Review Committee on Education in Radiologic Technology (JRCERT).

MULTIDISCIPLINARY BACHELOR IN RADIOLOGICAL SCIENCES CURRICULUM

Total Semester Credit-Hours: (86)

Professional Courses

CIRA 3101*	Introduction to Radiological Sciences	3
CIRA 3102*	Radiographic Exposure	3
CIRA 3103*	Introduction to Radiological Physics	3
CIRA 3105*	Radiographic Procedures I	4
CIRA 3201*	Digital Image Acquisition	3
CIRA 3204*	Pre- Clinical in Radiological Sciences	1
CIRA 3100*	Human Anatomy I	3
CIRA 3104*	Radiobiology	3
CIRA 3101*	Human Anatomy II	3
CIRA 3203*	Pathology and Medical Terminology	3
CIRA 3106*	Radiographic Procedures II	4
ENFE1035*	Applied Nursing	2
CIRA 3301*	Clinical in Radiological Sciences I	3
CIRA 3107*	Radiographic Procedures III	2
CIRA 3202*	Medical Image Analysis	3
CIRA 3302*	Clinical in Radiological Sciences II	9
CIRA 4202	Pathology in Computer Tomography	3

CIRA 4203	Fundamentals, Physics and Instrumentation Applied to Computed Tomography	3
CIRA 4201	Sectional Anatomy	3
CIRA 4204	Procedures and Protocols in Computed Tomography	3
CIRA 4101	Operations Management in Medical Imaging	3
CIRA 4205	Clinical in Computed Tomography	3
CIRA 4103	Regulation and Accreditation in Medical Imaging	3
CIRA 4102	Principles of Quality Control in Radiological Sciences	3
CISA 4035	Principles of Personnel Management in Healthcare organizations	3
CISA 4048	Basic Principles of Personnel Supervision	3
CIRA 4985	Practice in Medical Imaging Management	3
CIRA 4000	Comprehensive Seminar for Licensing Examination	1

Students admitted to Option 1.5 and 2, who already have an associate degree in Radiologic Technology must have completed 45 credits related to the area of conventional radiology. If the student does not have all 45 credits, they must take elective courses until they complete the required 45 credits. These credits will be taken according to the curricular sequence in the first semester of the year to be admitted. Admitted students with a Radiologic Technology associate degree will not need to take the conventional radiology courses marked with an asterisk. Students graduated from the MSC-SHP associate degree in radiologic technology have the 45 credits in conventional radiology.

POST-BACHELOR CERTIFICATE IN DIETETIC INTERNSHIP

General Information

As a member of the health care team, the registered dietitian nutritionist is directly responsible for the nutritional care of individuals and groups. This care includes the application of the science and art of human nutrition in helping people select and obtain food for the primary purpose of nourishing their bodies in health or disease throughout the life cycle. Dietitians work in a wide variety of employment settings including health care, business and industry, public health education, research, and private practice.

The Dietetic Internship Program of the School of Health Professions is a post-bachelor program that prepares professionals in nutrition and dietetics, with emphasis in medical nutrition therapy. It is an 11-month program providing learning opportunities geared to integrate previously acquired knowledge, obtain new knowledge, build resources for personal and professional growth, and develop skills in the best procedures for carrying out nutrition and dietetic services.

Admission Requirements

- Masters' degree in any discipline from a US regionally accredited college or university.
- A minimum general GPA of 3.00 in the master's degree.
- A Didactic Program in Dietetics (DPD) verification statement from an ACEND accredited DPD program
- Bachelor's degree from a US regionally accredited college or university.
- A minimum general GPA of 3.00 in the bachelor's degree. A minimum specific GPA of 3.00 in the undergraduate nutrition concentration courses.
- The applicant must have complete proficiency of the Spanish language; and also knowledge and comprehension of the English language.
- An interview with the Admission Selection Committee of the Dietetic Internship Program.

Deadline to submit transcripts and verification statement: **First week of August of the application year**.

Program of Study

- Introductory course (4 weeks).
- RDN Exam Practice Week (2 weeks)
- Supervised Practice Experiences (38 weeks)
  - Medical Nutrition Therapy
    - General
    - Concentration
  - Food Service System Management
  - Community Dietetics

Graduation Requirements

In order to graduate, students must complete the Dietetic Internship Introductory Course and approve all clinical experiences as specified by the Program. The information is readily available in the Dietetic Internship Manual.

- Make systematic progress toward completion of their non-degree certificate. This academic progress includes approval of all rotations with at least 80% percent.

- Complete all the Program requirements. These include the Dietetic Internship Introductory Course, the class program activities, and all clinical experiences including the Visual Veggies test and the eatrightPREP for the RDN Exam. All program requirements must be approved with a minimum score of 80%.
- The DIP is expected to be completed in 11 months. In order to comply with the institutional policies and procedures, the DIP graduation requirements must be completed within the established maximum time limit-24 months.

Licensure and Registration

Steps to become a Registered Dietitian Nutritionist (RDN) include:

- Completing Accreditation Council for Education in Nutrition and Dietetics (ACEND) accredited Didactic Program in Dietetics (DPD).
- Completing an ACEND accredited supervised practice program called a Dietetic Internship (DI) (consisting of a minimum of 1000 hours).
- A minimum of a master's degree to be eligible to take the credentialing exam to become a registered dietitian nutritionist (RDN).
- Passing a national examination administered by Pearson Vue under the guidance of the Commission on Dietetic Registration (CDR). CDR has mandated that beginning January 1, 2024, a minimum of a graduate degree will be required to sit for the RDN Exam. In addition, RDNs must complete continuing professional educational requirements to maintain registration (75 hours/5 years) and many states require that RDNs be licensed or certified.

While state interpretations of statutes may vary, it is ACEND's considered opinion that the program meets the educational requirements for dietetics licensure and certification in all states. However, completing an ACEND-accredited academic program alone does not qualify an individual for licensure or certification as a dietitian in any state. Individuals should review their state's licensing statutes and regulations to understand the specific requirements, including supervised practice and examinations, needed to obtain a dietetics license. More information about state licensure and certification can be found at this link: State Licensure (https://www.cdrnet.org/LicensureMap).

To practice the profession in Puerto Rico, it is necessary to approve the RDN exam or the LND local examination and become an active member of the College of Nutritionists and Dietitians of the Puerto Rico. Since 2016, candidates who present evidence they approved the Registered Dietitian Nutritionist (RDN) Examination are exempt from taking the local LND examination and may request a license in Puerto Rico. Read more information about educational pathways to become a RDN: https://www.cdrnet.org/RDN

Accreditation

TheAccreditation Council for Education in Nutrition and Dietitics (ACEND) of the Academy of Nutrition and Dietetics (AND) currently accredits the Dietetic Internship Program of the School of Health Professions for Education in Nutrition and Dietetics. ACEND® can be contacted by email ACEND@eatright.org, phone 1-800-877-1600 x5400, or mail 120 South Riverside Plaza, Suite 2190, Chicago, IL 60606-6995.

POST-BACHELOR CERTIFICATE IN CYTOTECHNOLOGY

The cytotechnologist is the professional qualified to analyze cellular samples under the microscope in order to detect neoplastic cells before the patient shows obvious symptoms of malignant growth. In this way, the cytotechnologist contributes to the early detection of disease.

The Cytotechnology Program offered by the University of Puerto Rico Medical Sciences Campus is a 12-month program requiring a total of thirty-eight (38) credit hours. Theoretical aspects are emphasized during the first six (6) months and supervised practice during the remaining six (6) months.

The program is designed to prepare health professionals with specific competencies in cytotechnology. The student is provided with adequate experiences for the development of capacities and skills in the management of a cytotechnology laboratory and in handling the necessary instruments and equipment.

Note: The program is under curricular revision. This academic year 2025-2026 is the last year to admit students under the current curriculum. A new master's degree program is expected to initiate admissions for August 2026. Admission Requirements are pending upon new program approval. It is expected that admission requirements will be kept the same except for the College Physics credits that will not be required for the new program.

Admission Requirements are pending upon new program approval. The following is an estimate:

Applicants to the program must have completed a Bachelor of Science or Bachelor of Arts degree from an accredited college or university. Students who wish to be considered for admission must also meet the following requirements:

- Have a general grade point average of at least 2.50.
- Have a grade point average of at least 2.50 in science courses.

Present evidence of completion of the following courses or their equivalents:

Required Courses	Semester Credit-Hours
Mathematics	6
College Physics	8
Chemistry	8
Biology*	20

Total	42

- Interview with faculty members.
- Fluency in Spanish, knowledge, and comprehension of English.

*It is highly recommended that applicants complete the following courses: Histology, Human Anatomy, Bacteriology, Physiology, Genetics, Parasitology, and Microbiology.

Graduation Requirements of current POST-BACHELOR CERTIFICATE IN CYTOTECHNOLOGY

In order to be recommended for graduation, students must:

- Obtain a minimum grade point average of 2.00 or higher in didactic courses and 3.00 or higher in the supervised practice.
- Satisfactorily complete the six (6) didactic courses and the supervised practice.
- Submit a research project related to the cytotechnology profession.
- Evaluate and interpret a minimum of sixty (60) cytological samples daily with ninety-five percent (95%) accuracy during the final practicum.
- Approve a comprehensive test offered by the program, with a minimum of 80%.
- Present evidence of the Board of Registry examination payment 30 days before completion of program courses.

Accreditation

The Post Bachelor Certificate in Cytotechnology of the School of Health Professions is currently accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) of the American Society of Cytopathology, 25400 US Highway 19 N, Suite 158 Clearwater, FL 33763. The Commission phone number is 727-210-2350.

POST-BACHELOR CERTIFICATE IN CYTOTECHNOLOGY CURRICULUM

Total Semester Credit-Hours: 38
Professional Courses

CITO 6505	Introduction to Cytotechnology	1
CITO 6507	General Concepts in Basic Sciences	2
CITO 6509	Female Genital System	12
CITO 6515	Respiratory and Gastrointestinal System	6
CITO 6516	Urinary System and Body Fluids	2
CITO 6517	Mammary Glands and Miscellaneous	2
CITO 6518	Clinical Practicum	13

MASTER OF SCIENCE WITH SPECIALTY IN SPEECH-LANGUAGE PATHOLOGY

The speech-language pathologists have the responsibility of evaluating, diagnosing, and treating persons with communication, feeding and swallowing problems. Communication problems could include speech disorders, such as speech sounds, fluency and voice. It also includes difficulties with language, literacy, social and cognitive communication. They evaluate the speech and language patterns of children and adults, determine whether communication problems exist, and offer appropriate intervention. Professionals

enrolled in the Speech-Language Pathology Program study typical and atypical communication and swallowing processes, different intervention approaches and preventive practices.

Program graduates are generally hired in Puerto Rico by private corporations or are independent service providers. There are additional employment opportunities in government agencies, federal programs, non-profit institutions and university institutions. Graduates are eligible for certification pending completion of a clinical fellowship year and approval of national exam (PRAXIS). The program is offered in a hybrid modality (online and face to face) and consists of two full-time academic years, including two summers. Part-time enrollment is possible, although less financial assistance is available to part-time students and the program will also take longer to complete. Students must be admitted into the Program before selecting any changes to the program of study. An individual part-time program of study could be arranged with the assistance of the student's academic advisor upon admission into the Program. Maximum program completion time is five years.

Admission Requirements

In order to be considered for admission, applicants must meet the following requirements:

- Hold a bachelor's degree from an accredited university with a general grade point average of 3.00 or higher.
- To participate in a preliminary Program orientation interview in which a written exercise will be carried out in Spanish and English.
- To be fluent in written and oral Spanish. The student must also demonstrate knowledge and comprehension of English language.
- Completion of 12 credits in the following areas* (or their equivalents) at an accredited university with a grade point average of 3.00 or higher.
- International students will also complete an oral interview with the Faculty in Spanish and English.

- Completion of 24 credits of prerequisite courses (or their equivalents) at an accredited university with a specific grade point average of 3.00 or higher.

Required Prerequisites Courses	**Semester Credit-Hours**
Linguistics	3
Statistics	3
Human Development and Learning	3
General Concepts on Child and Adult Handicaps*	3
Physical Sciences, or Chemistry	3
Biological Sciences	3
Mathematics	3
Social Sciences/Behavioral Sciences	3
Total	**24**

Graduation Requirements

In order to graduate, students must:

1. Approve a minimum of 62 credit hours.
2. Complete of a minimum of 400 hours of clinical practicum.
3. Have a minimum grade point average of 3.0.

4. Pass either the Masters comprehensive examination or the Speech-Language Pathology PRAXIS Exam.
5. Have Faculty recommendation.

Accreditation

The Master of Science program in Speech-Language Pathology at the University of Puerto Rico, Medical Sciences Campus is accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association, 2200 Research Boulevard, #310, Rockville, MD 20850, 800-498-2071 or 301-296-5700.
Current accreditation cycle: 2023 – 2031

MASTER OF SCIENCE WITH SPECIALTY IN SPEECH-LANGUAGE PATHOLOGY CURRICULUM

Total Semester Credit-Hours: 62

Basic and Foundational Concepts Component: 15 semester credit hours

PHAL 6417	Neuroscience of the Cognitive, Communication and Swallowing Mechanism	3
PHAL 6106	Linguistics and Acoustics in Communication Sciences and Disorders	3
PHAL 6105	Anatomy and Physiology for Speech-Language Pathology	3
AUDI 7118	Principles of Audiology	3
PHAL 6115	Language Acquisition	3

Professional Theory and Application Component: 39 semester credit hours

PHAL 6305	Assessment and Diagnostic in Speech-Language Pathology	3
PHAL 6512	Disorders of Communication in Children and Adults with Neurological Problems	3
PHAL 6119	Fluency Disorders	3
PHAL 6118	Voice and Resonance Disorders	3
PHAL 6519	Articulation Problems and Phonological Disorders	3
PHAL 6116	Swallowing Disorders in Children and Adults	3
PHAL 6542	Introduction to Assistive Technology in the Area of Augmentative and Alternative Communication	3
PHAL 6120	Child Language Disorders: Infancy through Preschool Years	3
PHAL 6121	Language Disorders in School-Age Children	3
PHAL 6308	Research Design in Speech-Language Pathology	2
PHAL 6316	Assessment and Intervention of Individuals with Hearing Loss	2
PHAL 6235	Seminar: Evidence-Based Practice in Speech-Language Pathology	1
PHAL 6420	Capstone Course in Speech-Language Pathology	3
PHAL 6236	Seminar: Ethical, Legal, Professional and Public Health Issues in Speech-Language Pathology	1
PHAL 6520	Seminar: Supervision in Speech-Language Pathology	1
PHAL 6117	Intervention Strategies in Speech Language Pathology	1
PHAL 6315	Seminar: Multilingual and Multicultural Issues in Speech-Language Pathology	1

Clinical Practicum Component: 8 semester credit hours

PHAL 6601	Clinical Practicum I: Clinical Observations in Speech-Language Pathology	0.5
PHAL 6602	Clinical Practicum II in Speech-Language Pathology	1
PHAL 6603	Clinical Practicum III in Speech-Language Pathology	3
PHAL 6604	Clinical Practicum IV in Speech-Language Pathology	3.5

MASTER OF HEALTH INFORMATION MANAGEMENT

The Health Information Management (HIM) professionals, lead efforts to ensure the availability, accuracy, integrity, and security of all data related to patient healthcare encounters that result in better clinical and business decisions to enhance healthcare quality (AHIMA, 2017). As a member of the health team, the (HIM) professional performs tasks regarding the definition, design, management, and evaluation of the health information system. They serve in bridge roles, connecting clinical, operational, and administrative functions.

Program graduates are generally hired in Puerto Rico by general and specialized hospitals; outpatient services; colleges and universities; insurance companies and pharmaceutical industries in general. It offers advice on various areas and you can create your own business in billing for medical services, among others.

The program consists of two academic years and a summer session for 69-quarter credits of graduate level course work. The curriculum is based on a series of structured learning sequences, which include didactic, laboratory and professional practice experiences. The curriculum is offer during evening hours, from 5:00 to 9:30 p.m., except the experience of professional practice performed in daytime.

Admission Requirements

In order to be considered for admission, applicants must meet the following requirements:

- Possess a Baccalaureate degree or its equivalent from an accredited university.
- Possess a General grade point average of at least 2.50 in a scale of 0.0 to 4.00.
- Possess a Specific grade point average of at least 2.00 in a scale of 0.0 to 4.00.
- Have approved a three-credit course with no less than "C" in each of the following areas: Human Anatomy, Human Physiology, and Fundamentals of Informatic System (Skills in MS OFFICE or equivalent).
- Interview with the program's faculty.
- Fluency in Spanish; must also have knowledge and comprehension of English.

Graduation Requirements

In order to graduate, students must:

- Obtain a general grade point average of 3.00 or higher, in a scale of 0.00 to 4.00.
- Satisfactorily complete (with B or higher) the courses specified in the curriculum sequence.
- Complete all theoretical and clinical practice activities specified by the program.
- Complete graduation requirements within a five-year period.

Accreditation

The Master Program in Health Information Management at the Medical Sciences Campus, University of Puerto Rico, is accredited by the Commission on Accreditation for Health Informatics and Information Management (CAHIIM), located in 200 East Randolph Street Suite 5100, Chicago, Illinois 60601. CAHIIM phone number is (312) 235-3255 and website is: https://www.cahiim.org.

MASTER OF HEALTH INFORMATION MANAGEMENT CURRICULUM

Total Trimester Credit-Hours: 69

ADIS 6106	Principles of Health Information Management (HIM)	4
ADIS 6107	Health Record in Healthcare Organizations	3
ADIS 6108	Coding and Classification System of Diseases	3
ADIS 6005	Legal Aspects of Health Record Management	4
ADIS 6115	Evaluation of Quality in Healthcare Organizations	2
ADIS 6121	Pre-internship in Health Information Management (HIM)	2
ADIS 6111	Analysis and Design of Health Information Systems	2
ADIS 6125	Human Resources Management	3
ADIS 6112	Implementation and Evaluation of Health Information Systems	2
ADIS 6135	Finance in Health Information Management	4.5
ADIS 6136	Security in Health Information Management	4.5
ADIS 6127	Seminar in Health Information Management	2
ADIS 6122	Internship in Health Information Management and Research Project	5
ADIS 6190	Strategic Management and Leadership	3
ADIS 6191	Research Methods in Health Information Management	4
ADIS 6220	Applied Descriptive and Inferential Statistics	4.5
ADIS 6221	Introduction to Pathophysiology and Pharmacology	4.5
ADIS 6222	Applied Healthcare Statistics in Health Information	4.5
ADIS 6223	Clinical Foundation of Health Information Management	4.5
ADIS 6224	Principles of Healthcare Reimbursement	3

For additional information about the Program, please visit the School of Health Professions web page at: https://eps.rcm.upr.edu/master-in-health-information-management/.

MASTER OF SCIENCE IN CLINICAL LABORATORY SCIENCES

The Masters of Science in Clinical Laboratory Program from the School of Health Professions of the Medical Sciences Campus, University from Puerto Rico began in 1996.

Graduates who have a Baccalaureate degree or Post Baccalaureate Certificate in Medical Technology from an accredited institution of higher learning and be certified by the Commonwealth of Puerto Rico or an equivalent professional accrediting agency can apply to the program. It is designed to fit the needs of the medical technologist that works. It offers and innovative educational experience in areas related to molecular diagnosis; modern techniques of administration; quality control and quality assurance in the clinical laboratory and leadership, among others. In addition, the program emphasizes the research component requiring a research proposal and a research project with publishable results. The program is designed to be completed in three years. The courses are offered on schedule evening and Saturday (one day a week from 5:00 pm - 9:00 pm and alternate Saturdays of 8:00 am - 12:00 pm). **Some courses are offered in a hybrid or online modality.**

Admission Requirements

- Qualified applicants must have earned a Baccalaureate degree or Post-Baccalaureate Certificate in Medical Technology from an accredited institution of higher learning and be certified by the Commonwealth of Puerto Rico, or an equivalent professional accrediting agency.
- Two letters of recommendation from former professors and/or from employers.

- A personal interview with the Program's faculty.
- An Intention Letter that will be written the same day of the interview.
- Two official transcripts from all the institutions attended
- General grade point average of at least 2.50.

Graduation Requirements

In order to graduate, students must:

- Complete the 36-credit-hour program.
- Obtain an overall grade point average of 3.00.
- Complete the research project approved by the faculty.
- Complete graduation requirements within a five-year period.

MASTER OF SCIENCE IN CLINICAL LABORATORY SCIENCES CURRICULUM
(With emphasis in Molecular Diagnostics)

Total Semester Credit-Hours: 36

CILC 6008	Advanced Clinical Hematology	2
CILC 6020	Clinical Laboratory Management	2
CILC 6019	Clinical Laboratory Statistics	2
CILC 6046	Genetics and Molecular Biology	2
CILC 6055	Fundamentals of Research Proposal Design	2
CILC 6305	Clinical Laboratory Science Research	3
CILC 6026	Special Topics in Clinical Laboratory Administration	2
CILC 6040	Practice in Administration and Quality Assurance	3
CILC 6035	Quality Assurance I	2
CILC 6036	Quality Assurance II	2
CILC 6205	Laboratory Information Systems and Informatics	2
CILC 6015	Advanced Clinical Immunology Studies I	2
CILC 6016	Advanced Clinical Immunology Studies II	2
CILC 6301	Molecular Diagnostics I	2
CILC 6302	Molecular Diagnostics II	2
CILC 6306	Pharmacogenomics: The Scientific Principles of Personalized Medicine	2
CILC 6400	Seminar	2

MASTER OF SCIENCE IN OCCUPATIONAL THERAPY

The Master of Science in Occupational Therapy is the first and the only entry-level professional program in Occupational Therapy in Puerto Rico that prepares occupational therapists at the master level. Graduates with baccalaureate degrees in disciplines other than Occupational Therapy can become occupational therapists through this program. Occupational Therapy is a profession that focuses on enabling a person or a group of persons to access and participate in occupations (activities) that are meaningful, purposeful, and relevant to their lives, roles, and sense of well-being. Occupational therapists consider occupation to be everything people do to occupy themselves, including taking care and supporting themselves and others, work, education, play, enjoying life (leisure) and social participation with family, friends and colleagues and in the community in general. Occupational therapists assess, utilize, and adapt everyday activities to improve function, enhance performance, promote health, prevent illness, and increase independence in those persons to whom they provide services. Occupational therapists examine not only the physical effects of an

injury or disease, but also address the psycho-social, cognitive, community and environmental factors that influence function.

Occupational therapists work in a range of settings including: hospitals, rehabilitation centers, outpatient centers, mental health centers, school system, pediatric clinics, community centers, workplaces, skilled nursing facilities, nursing homes, home health and in private practice. They provide services in all areas in which people engage in their everyday activities.

The academic program is full-time, two years and a half in length. Two years are required to complete the didactic courses. Twenty-four weeks of internship (fieldwork) are required for certification to practice. The internship entails three rotations. Each rotation is completed in eight weeks, full-time periods following the didactic courses of the academic program. Students must complete 24 weeks of Level II fieldwork within 24 months following completion of the didactic portion of the program. Upon completion of all graduation requirements, the student receives a Master in Science in Occupational Therapy.

Satisfactory completion of both the academic program and 24 weeks of internship (fieldwork) are required to be eligible to take a test offered by the Puerto Rico Occupational Therapy Board of Examiners (PROTBE) and to take the Certification Examination offered by the National Board for Certification in Occupational Therapy (NBCOT). Successful completion of the test offered by PROTBE allows graduates to obtain a license to practice the profession in Puerto Rico. Passing the certification examination is the final step in becoming an Occupational Therapist Registered (OTR) and qualifies the OTR for working in the United States and in Puerto Rico. Previous conviction of a felony may affect graduate's eligibility to sit for the certification examination, the licensure test and to attain licensure. For program outcomes on licensure, please refer to program website http://eps.rcm.upr.edu/master-of-science-in-occupational-therapy/ and https://secure.nbcot.org/data/schoolstats.aspx.

Admission Requirements:

Candidates for admission for the entry-level master in Occupational Therapy must have:

- a Bachelor's degree in a discipline other than Occupational Therapy from an accredited university.
- oral and written knowledge and fluency in English and Spanish.
- a specific grade point average of 3.00 in the following required pre-requisite courses:

Required Courses	**Semester Credit-Hours**
Second Year English (literature content)	6
Sociology or Anthropology	3
Human Growth and Development across the life span	3
Human Biology I and II or Human Anatomy and Physiology (Code 300 or 3000 and above)	6
Basic Statistics	3
Total	**21**

- at least 12 credits of the pre-requisite courses approved, including 3 credits in Human Anatomy and Physiology by the application submission deadline (January 31). All pre-requisite courses should be completed by the month of May of the year of application to the program.
- a general grade point average of 2.80 in the baccalaureate degree.
- an official report of score obtained in the Graduate Record Examination Exam (GRE) General Test (verbal, quantitative, and analytical writing). There is no required minimum GRE score. The test

score is valid for five (5) years and must be taken no later than December of the year prior to the one interested in admission.
- A laptop computer or equivalent portable device and internet access are required.
- After an initial evaluation of the admission criteria with all applicants, the program's Admissions Committee will determine which candidates will be invited to an interview, using a written essay, as a final part of the evaluation process.
- Submit a written essay of an assigned topic using a word processor the day selected by the Admission Committee.

Graduation Requirements:

In order to graduate, students must meet the following requirements:

- Complete all the requirements of the didactic (68 credits) and the fieldwork component (16 credits) of the curriculum with a minimum GPA of 2.80, within a maximum period of 5 years after registration as first year OT student.
- Demonstrate professional behaviors considered acceptable by faculty and fieldwork supervisors and in accordance with regulations of the Medical Sciences Campus, the School of Health Professions and the Occupational Therapy Program.

Accreditation

The Occupational Therapy Program is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA), located at 6116 Executive Boulevard, Suite 200, North Bethesda, MD 20852-4929. ACOTE'S telephone, c/o AOTA, is (301) 652-AOTA, and its Web address is : www.acoteonline.org.

MASTER OF SCIENCE IN OCCUPATIONAL THERAPY CURRICULUM

Total Semester Credit Hours 84

TEOC 6005	Human Anatomy	3.5
TEOC 6001	Foundations of Occupational Therapy I	4
TEOC 6007	Occupation from a Developmental Perspective	4
TEOC 6008	Professional Development in Occupational Therapy	3
TEOC 6010	Principles to Inform Occupational Therapy Practice	3
TEOC 6101	Occupational Dysfunction I	3
TEOC 6004	Active Learning	1
TEOC 6009	Dimensions of Human Movement in Occupational Performance	4
TEOC 6401	Evidence Based Practice in Occupational Therapy I	3.5
TEOC 6006	Basic Neuroscience	4
TEOC 6501	Fieldwork Experience Level I Part A	2
TEOC 6102	Occupational Dysfunction II	3
TEOC 6402	Evidence Based Practice in Occupational Therapy II	2
TEOC 6201	Theory and Practice of Occupational Therapy in Psychosocial Dysfunction I	3
TEOC 6301	Theory and Practice of Occupational Therapy in Pediatrics I	3
TEOC 6203	Theory and Practice of Occupational Therapy in Physical Dysfunction I	3
TEOC 6205	Context and Management of Occupational Therapy Service	3
TEOC 6403	Evidence Based Practice in Occupational Therapy III	3
TEOC 6202	Theory and Practice of Occupational Therapy in Psychosocial Dysfunction II	4

TEOC 6302	Theory and Practice of Occupational Therapy in Pediatrics II	4
TEOC 6204	Theory and Practice of Occupational Therapy in Physical Dysfunction II	4
TEOC 6303	Special Topics in Occupational Therapy	3
TEOC 6502	Fieldwork Experience Level I Part B	2
TEOC 6503	Fieldwork Experience Level II	12

For additional information about the Program, please visit the School of Health Professions web page at: http://eps.rcm.upr.edu/master-of-science-in-occupational-therapy/.asp

DOCTORAL PROGRAM IN AUDIOLOGY (AU.D.)

General Information

The audiologist is the autonomous professional who identifies, evaluates and manages hearing loss and balance disorders. In addition, the audiologist:

- Provides audiologic habilitation for infants/children and audiologic rehabilitation for adults.
- Selects, prescribes and programs hearing aids and other amplification systems and assistive communication devices.
- Prevents hearing loss through education to consumers, selection and fitting of hearing protectors and counseling regarding the effects of noise on the auditory system.
- Participates in research in the areas of prevention, identification and treatment of hearing loss, tinnitus and disorders of the balance system.

Employment Setting

Audiologists are qualified to work in private practice and government agencies such as the Department of Health, Education and Family Services. Other employment opportunities are available in Federal Programs, Private Institutions and Universities.

Academic Description of the Program

The Doctor in Audiology (Au.D.) is a professional entry-level degree. The Program is a four-year, full-time, post-baccalaureate program that includes academic, research and clinical experiences. The academic, research and clinical experiences are guided toward the acquisition of critical knowledge and skills in four areas: foundation of practice, prevention and identification, evaluation and treatment of hearing, and balance disorders. The curriculum also reflects the scientific knowledge, skills, and the use of technology that characterizes the current scope of practice in Audiology. The Program requires the approval of 132 semester credit hours of post-baccalaureate study, and a practicum experience, which is equivalent to a minimum of 12 months of full-time, supervised clinical experience. The student has a maximum of 7 years to complete the degree requirements, after initial registration as a first-year student. Students must attend the Audiology Program on a full-time basis.

Admission Requirements

The Audiology Program will accept applicants by direct admission from accredited universities, which meet the following requirements:

- Possess a Baccalaureate degree or its equivalent from an accredited university.
- Possess a general Grade Point Average (GPA) of at least 3.00.

- Possess a specific Grade Point Average (GPA) of at least 3.00. The specific grade point average refers to the 24 credits, which are pre-requisites for admission into the Audiology Program.
- Official report of score obtained in the Graduate Record Examination Exam (GRE)There is no minimum exam score required to apply. The exam must be taken within five calendars years of the application date.
- Complete twenty-four (24) of twenty-seven (27) credits in the following areas or their equivalent:

  Pre-requisite Courses*

General Physics	3
Statistics	3
Human Development throughout lifespan**	3
General Biology	3
Pre-Calculus	3
General concepts on individuals with special needs	3
Psychology	3
Social Sciences	3
Total	**24/27**

  *The pre-requisite courses used for the computation of the specific index must be approved with a grade of C or higher.
  **The credits required vary since some of the courses on human development cover lifespan in one 3 credits course, while others cover it in two 3 credits courses.

- Knowledge and comprehension of written and spoken English and Spanish. This will be evaluated during the faculty interview.
- Interview with the program's faculty.
- Obtain at least a 75% of the total admission formula
- Provide Two official transcripts
- Completed admission form

Graduation Requirements

In order to receive the degree, the student must fulfill the following requirements:

- Approve 132 semester credits with a grade point average of 3.00 or higher, in a scale of 0 to 4.00.
- Approve a comprehensive examination.
- Complete a minimum of a year of full-time clinical practice.
- Approve clinical practicum examination.
- Demonstrate appropriate professional behavior.

Licensure

In order to practice the profession of Audiology in Puerto Rico it is necessary to obtain a license. The license requirements are to hold a Masters or Doctoral degree in Audiology and to approve the exam offered by the Examining Board in Speech-Language Pathology, Audiology and Speech Therapy of the Department of Health of Puerto Rico.

Accreditation

The Doctoral Program in Audiology at the Medical Sciences Campus of the University of Puerto Rico is accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology (CAA) of the American Speech-Language-Hearing Association, 2200 Research Boulevard #310, Rockville, Maryland 20850, 800-498-2071 or 301-296-5700. (http://www.asha.org/academic/accreditation/caaDecisions/).

DOCTOR IN AUDIOLOGY CURRICULUM

Total Semester Credit Hours: 132

First Year: 38 Credit Hours

HLAG 6303	Anatomy of the Speech and Hearing Mechanism	3
HLAG 6325	Communication Development of the Normal Child	3
HLAG 7111	Research Methods in Communication Sciences and Disorders I	2
AUDI 7115	Acoustics for Hearing and Speech Sciences Laboratory	1
AUDI 7116	Acoustics for Hearing and Speech Sciences	3
AUDI 7117	Principles of Audiology Laboratory	1
AUDI 7118	Principles of Audiology	3
HLAG 6300	Basic Concepts in Linguistics, Psycholinguistics, and Psychoacoustics	3
HLAG 7112	Research Methods in Communication Sciences and Disorders II	2
AUDI 7119	Instrumentation in Audiology	2
AUDI 7120	Speech Disorders	3
AUDI 7125	Pharmacology in Audiology	2
AUDI 7126	Advanced Audiology	3
AUDI 7127	Laboratory of Advanced Audiology	1
AUDI 7216	Differential Diagnosis in Pediatric Audiology	3
HLAG 6533	Language Disorders of Children	3

Second Year: 33 Credit Hours

AUDI 7201	Clinical Practicum I	1
AUDI 7211	Amplification Systems I	3
AUDI 7213	Amplification Systems I Laboratory	1
AUDI 7217	Psychosocial Aspects of Hearing Loss	2
AUDI 7218	Auditory Pathologies	3
AUDI 7305	Audiologic Habilitation of the Pediatric Population	3
AUDI 7128	Physiological Assessment of the Auditory System	3
AUDI 7129	Laboratory of Physiological Assessment of the Auditory System	1
AUDI 7202	Clinical Practicum II	2
AUDI 7500	Clinical Seminar	1
AUDI 7231	Assessment and Intervention of Balance Disorders I	2
AUDI 7226	Research Application in the Clinical Practice of Audiology	2
AUDI 7212	Amplification Systems II	3
AUDI 7214	Amplification Systems Laboratory II	1
AUDI 7227	Occupational and Environmental Hearing Conservation	2
AUDI 7228	Occupational and Environmental Hearing Conservation Laboratory	1
AUDI 7221	Research Project I	2

Third Year: 32 Credit Hours

AUDI 7203	Clinical Practicum III	3
AUDI 7500	Clinical Seminar	1
AUDI 7315	Auditory Processing Disorders	2
AUDI 7318	Deaf Culture, Linguistics and Manual Communication Code Systems	3
AUDI 7319	Audiologic Rehabilitation of the Adult	3
AUDI 7232	Assessment and Intervention of Balance Disorders II	2
AUDI 7317	Assessment and Intervention of Balance Disorders II Laboratory	1
AUDI 7222	Research Project II	2
AUDI 7204	Clinical Practicum IV	3
AUDI 7500	Clinical Seminar	1
AUDI 7325	Professional Issues in Audiology	3
AUDI 7326	Management Applications in Audiology Practice	3
AUDI 7327	Special Topics in Audiology	3
AUDI 7223	Research Project III	2

Fourth Year: 29 Credit Hours

AUDI 7405	Clinical Practicum V	15
AUDI 7406	Clinical Practicum VI	14

DOCTOR OF PHYSICAL THERAPY PROGRAM (DPT)

The Physical Therapy Program at the University of Puerto Rico is the first established academic program in Puerto Rico, which leads to a professional entry-level degree in physical therapy. The mission of the Physical Therapy Program is to graduate doctors of physical therapy as general clinical practitioners, who provide direct clinical care, contribute to the evidence for practice, and engage in education, consultation, advocacy, and administration of services focused on health problems that adversely affect movement, functional activity and participation in society. The scope of clinical services provided by the Doctor in Physical Therapy includes health promotion, wellness, fitness, prevention, acute care, habilitation, and rehabilitation. Program graduates will engage in practice that is grounded in scientific evidence and consistent with the core values of the physical therapy profession.

The graduate of the Doctorate Physical Therapy Program is a general practitioner capable of assuming responsibility in the areas of direct patient care, education, research, administration, and consultation. He or she will have the ability to solve problems including not only responsibility but also accountability for all actions. He or she will be able to use his or her leadership skills in daily actions, dialogue, and decision-making.

The graduate of the Physical Therapy Program will:

1. Provide comprehensive physical therapy services in primary, secondary, tertiary care, wellness and fitness, promotion of health and prevention of disease and injury, integrating clinical, administrative, teaching, consultative, advocacy, and research skills.
2. Exhibit critical thinking abilities to serve as a competent problem solver capable of justifying decisions based on evidence.
3. Demonstrate effective communication and interpersonal skills in all professional interactions including respect and responsiveness to diversity.

4. Commit to self-directed lifelong learning.
5. Practice autonomously and collaboratively.
6. Adhere to legal, ethical, and practice standards of the Physical Therapy profession.

ADMISSION REQUIREMENTS

Candidates for admission to the Program must meet each of the following criteria:

- Possess a Baccalaureate or post-Baccalaureate degree from an accredited higher education academic institution evidenced by official transcripts.
- 30 hours of voluntary service, observation or shadowing in a physical therapy setting under the supervision of a licensed physical therapist. Those hours should be completed during the last two years before submitting application to the program. The Clinical Observation Form in the following page should be handled to evidence this experience.
- Obtain 70% or more in personal interview. The personal interview assesses non-cognitive traits such as: communication skills, motivation to pursue the career of physical therapy, and professional behavior and attitude. A candidate who obtains less than 70% in the interview will not be admitted to the program.
- Official report of score obtained in the Graduate Entrance Examination Exam (GRE) will be required when all authorizations from the governance bodies of the University of Puerto Rico are obtained. Students must check the program's website to update this requirement. There is no minimum exam score required to apply. The exam must be taken within three calendars years of the application date.
- An overall Grade Point Average (GPA) of 3.0 in a scale of 0.0 to 4.00.
- Have passed with C or higher and have a grade point average (GPA) of 2.80 (in a scale of 0.0 to 4.00) or higher in the following pre-requisite courses:
    - General Biology- 6 semester credit hrs.
    - Human Biology- 6 to 8 semester credit hrs.
    - General Physics- 8 semester credit hrs.
    - General Chemistry-8 semester credit hrs.
    - Statistics-3 semester credit hrs.
    - General Psychology-3 semester credit hrs.
    - Human Development throughout the lifespan-3 semester credit hrs.
    - Total semester credit hours: 37 to 39
    - General Biology, Physics, and Chemistry courses should include both lecture and laboratory instruction. Human Biology I and II courses are required.

Computer literacy and internet skills are also highly recommended for admission to the program.
Curriculum is conducted in Spanish and English and most patient interactions are in Spanish. Therefore, fluency in speaking, writing, and reading both languages is highly recommended.

GRADUATION REQUIREMENTS

To receive the DPT degree, the student must:

- Complete the program degree requirements within the maximum period established by the program to attain the degree (7 years after the date of first enrolment in the program).

- Exhibit professional and ethical behaviour in accordance to the Student Code of Conduct of the University of Puerto Rico1, and the APTA Code of Ethics for the Physical Therapist.2
- Successfully approve a minimum of 132.5 credit-semester hours.
- Obtain a cumulative GPA of at least 3.00 in a 0.00 to 4.00 scale. The cumulative GPA includes all the grades obtained in the program.
- Approve each course with a minimum grade of "C" in a 0.00 to 4.00 scale except for TEFI 7035 Basic Clinical Skills in PT, which must be approved with a minimum grade of "B", and the following courses, which must be approved with a "P" in an "Approved/ Non-Approved" scale:

  Research Project II
  Research Project III
  Clinical Experience I
  Clinical Experience II
  Clinical Experience III
  Clinical Experience IV
  Clinical Internship

Students are required to take the PEAT exam. This requirement is embedded in the clinical internship course and is geared to enhance student preparedness for the licensure examination and for the program to have access to a summative standardized assessment measure. PEAT's approval is not required for graduation.

LICENSING REQUIREMENTS IN PUERTO RICO

In order to practice the profession of Physical Therapy in Puerto Rico the graduate of the program must follow the dispositions of Act Number 114 approved June 29, 1962 as amended which regulates the practice of this profession. This law requires that the graduate present evidence of graduating from a CAPTE accredited program. The graduate must approve a licensing exam to practice the profession in Puerto Rico. In addition, the practicing physical therapist must comply with 30 continuing education hours every three years to be maintained in the health professions register of the Department of Health (Law # 11 approved June 23, 1976 as amended). Information regarding these issues can be obtained through the Board of Physical Therapy Examiners of Puerto Rico at the following address and telephone number:

P.O. Box 10200 Santurce, PR 00908-0200
TEL. (787) 765-2929 Ext. 6559
igolderos@salud.pr.gov

Accreditation

The Doctor of Physical Therapy at the Medical Sciences Campus, University of Puerto Rico is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE), 3030 Potomac Ave., Suite 100 | Alexandria, VA | 22305-3085 ; telephone: 800-999-2782email: accreditation@apta.org; website: http://www.capteonline.org.

DOCTOR OF PHYSICAL THERAPY CURRICULUM

1. Código de Conducta Estudiantil de la Universidad de Puerto Rico. December 2010. Available in: Código de Conducta Estudiantil Universidad de Puerto Rico. Accessed September 10, 2012.

2. Code of Ethics for the Physical Therapist. American Physical Therapy Association House of Delegates HOD S06-09-07-12. September 2012. Available in: http://www.apta.org/Ethics/Core/ Accessed October 2012.

Total Semester Credit Hours: 132.5
**** First Year: 39.5 Credit Hours**

TEFI 7035	Basic Clinical Skills in Physical Therapy	2
ANAT 7425	Human Anatomy	4
TEFI 7015	Introduction to Professional Socialization	3
TEFI 7025	Research in Physical Therapy I	3
TEFI 7045	Clinical Exercise Physiology	2.5
TEFI 7055	Health Promotion, Wellness and Prevention	3
TEFI 7011	Clinical Kinesiology I	2.5
TEFI 7051	Pathophysiology I	4
TEFI 7027	Research in Physical Therapy II	2
TEFI 7046	Clinical Neuroscience	3.5
TEFI 7016	Physical Therapist as Educator and Communicator	3
TEFI 7031	Evidence-Based Practice in Physical Therapy I	2
TEFI 7065	Physical Agents	2
TEFI 7066	Pharmacology for Physical Therapists	1.5
TEFI 7067	Imaging for Physical Therapists	1.5

Second Year: 33.5 Credit Hours

TEFI 7012	Clinical Kinesiology II	3
TEFI 7032	Evidence Based Practice in Physical Therapy II	2
TEFI 7105	Clinical Management of Spinal Dysfunctions	2.5
TEFI 7052	Pathophysiology II	4
TEFI 7106	Electrotherapeutic and Electrodiagnostic Procedures	2
TEFI 7111	Clinical Education Experience I	2
TEFI 7205	Clinical Management of Upper and Lower Extremities Dysfunctions	2.5
TEFI 7201	Research Project I	2
TEFI 7206	Motor Development and Learning	3
TEFI 7207	Clinical Management of Integumentary Dysfunctions	1.5
TEFI 7208	Clinical Management of Cardiovascular and Pulmonary Dysfunctions	3
TEFI 7209	Clinical Education Experience II	6

Third Year: 39.5 Credit Hours

TEFI 7310	Clinical Management of the Neurologically Impaired Adult	2.5
TEFI 7309	Social Aspects of Health and Illness	3
TEFI 7305	Prostheses and Orthoses	2
TEFI 7306	Ergonomics	1
TEFI 7307	Clinical Management of Endocrine, Immunologic, Genitourinary, and Gastrointestinal Dysfunctions	1.5
TEFI 7308	Research Project II	2
TEFI 7103	Research Project III	2
TEFI 7102	Clinical Management of the Neurologically Impaired Child and other Pediatric Conditions	2.5
TEFI 7104	Health Care System and Administration in Physical Therapy	3
TEFI 7101	Clinical Education Experience III	10
TEFI 7113	Clinical Education Experience IV	10

Fourth Year: 20 Credit Hours

TEFI 7114	Clinical Internship	20

MASTER OF SCIENCE IN CLINICAL AND TRANSLATIONAL RESEARCH JOINT DEGREE PROGRAM

NOTE: This program is currently being subject to administrative and academic evaluation. Institutional procedures are underway to restructure this program or for potentially placing this masters programs in moratorium following established academic governance protocols. Please contact the School of Health Profession or School of Medicine for additional information.

The Post-Doctoral Master of Science in Clinical and Translational Research program is a joint academic offering between the School of Health Professions and the School of Medicine of the Medical Sciences Campus, University of Puerto Rico. The program started in 2001 with a NIH-Planning Grant and has been continuously partially funded by the National Institutes of Health (NIH) (2001-2022) through the Hispanic Clinical and Translational Research Education and Career Development (HCTRECD) Award (R25MD007607) from the National Institute on Minority Health and Health Disparities. It offers a multidisciplinary training program in clinical and translational research, integrating the didactic component with a mentor-based research experience to prepare independently funded and committed clinical translational researchers.

At present, the postdoctoral master program is the only formal training program in clinical and translational research for young faculty with a doctoral degree in Puerto Rico. Our program has extensive local and national collaborations including Universidad Central del Caribe, Ponce Health Sciences University, Mayo Clinic and the University of Pittsburgh.

The post-doctoral master program is designed to meet the need for formal academic training in quantitative, qualitative, mixed methods and other methodological principles of clinical research, including patient-oriented research, epidemiologic and behavioral studies, outcomes research, precision medicine, population-based research, and health services research. Graduates of the post-doctoral program are trained to plan original clinical research with adequate sample size, sampling methods, well-defined diagnostic criteria, and effective control of confounding variables. The program consists of a two-year competency-based curriculum with two major components: didactic courses and a mentored research project (research component).

The program's mission is to promote the development of multidisciplinary clinical scientific teams working in collaboration toward the attainment of two common goals: improvement in quality of life and decrease health disparities. In the research component, the program targets specific health conditions of high priority to the Hispanic population.

Through the research component course, the program targets specific health conditions of high priority to the Hispanic population based on the mortality and morbidity trends in Puerto Rico. The main areas that will be given priority are: cancer, HIV/AIDS, diabetes, infant-maternal health, mental health, drug abuse and addiction (alcohol and tobacco). Other areas that are considered are: liver disease, obesity, cardiovascular diseases, respiratory diseases, aging related conditions and oral health.

The graduates are expected to become independently funded and committed clinical researchers able to develop culturally appropriate research aimed at reducing health disparities in Hispanic populations, conduct ethically responsible clinical research, build and lead effective collaborative networks in their areas) of clinical research interest, communicate effectively in writing and orally (unless a handicap precludes one of these forms of communication), be able to work collaboratively, interdependently and effectively with other disciplines on the clinical research team and become a lifelong self-directed learner.

Admission Requirements

The admission process for the Post-doctoral Master of Science in Clinical and Translational Research (MSc) is competitive and quantitative. All applicants are screened administratively for completeness and adherence to requirements. Applicants meeting all application requirements will be evaluated and ranked according to the admission formula. The admission formula considers three main aspects: 1) General Point Average; 2) Personal and Professional Characteristics (PPC) and 3) Performance-Based-Interview (PBI).

Admission Requirements for NIH Fellowship Candidates

Through the HCTRECD award, the program can sponsor qualifying students. The program will competitively evaluate all interested candidates from accredited institutions. This award will be offered to the top ranked candidates that qualify comply with the following qualifications:

- Candidates must be in a position at an academic institution (priority will be given to candidates with faculty tenure track position (postdoctoral students, residents and fellows will be considered)
- Candidates must be within seven years of completion of their doctoral degree or 10 years from end of post-graduate clinical training.
- Must be USA citizen or resident

Relevant clinical degrees are: MD, DDS, DMD, DO, OD, ND (Doctor of Naturopathy), PhD and Pharm D, among others. Also, individuals with doctoral degrees in the following fields can be considered: basic sciences, nursing, clinical psychology, engineering, education, social sciences, economics and other individuals with doctoral degree pursuing clinical and translational research.

Admission Requirements for Non-NIH Candidates

Any individual with a doctoral degree who does not qualify for the NIH Award can apply to the program.

Application Requirements

- Non-refundable Application fee
- Medical Sciences Campus Application Form
- Curriculum Vitae/Biographical Sketch
- Fluent in the English language
- Minimum doctoral general grade point average of 3.0
- Interview with members of the program's Admissions Committee (In English)
- Two official transcripts from the institution granting the doctoral degree
- Two Letters of recommendations from individuals acquainted with the applicant’s science/research related activities
- One-page Personal statement detailing how this program will contribute to the candidate career goals
- A two-page Research intention letter in one of the program’s relevant health areas
- Individual Development Plan (IDP)
- If applicable, two formal commitment letters approving 50% release time for the first year and 75% release time for the second year to attend this program by: (i) Dean and (ii) Immediate Supervisor (Department Chair, Division Director or Program Director)

The maximum number of candidates to be admitted to the post-doctoral Master of Science in Clinical and Translational Research program will be up to five (5) Scholars.

Graduation Requirements

A Master of Science in Clinical and Translational Research degree will be awarded to those scholars that successfully complete the 24 semester credits of the didactic component, 6 semester credits of the research component, and 1 semester credit of an elective course (for a total of 30 semester credits):

- Completion of all MSc coursework
- Protection of Human Subjects Certifications
- Copy of research proposal and evidence of IRB approval
- Evidence of abstract presentation in a national/international scientific meeting
- Copy of final project oral presentation, as part of RECDES with the results of the research project
- Evidence of submission to a peer-reviewed scientific journal of a manuscript with the scholar as 1st author of the research conducted during the postdoctoral training. This manuscript must have the acknowledgment to the NIMHD R25MD007607 and must comply with NIH public access policy
- Mentor letter stating completion of IDP goals and pilot project

MASTER OF SCIENCE IN CLINICAL AND TRANSLATIONAL RESEARCH CURRICULUM

Total Semester Credit Hours: 30

INCL 6005	Introduction to Clinical and Translational Research	1
INCL 6016	Application of Informatics in Research	1
INCL 6025	Bioethics and Regulatory Issues in Clinical and Translational Research	2
INCL 6041	Biostatistics in Clinical and Translational Research I	2
INCL 6042	Biostatistics in Clinical and Translational Research II	2
INCL 6045	Introduction to Bioinformatics and Medical Genomics	1
INCL 6047	Epidemiology in Clinical and Translational Research	3
INCL 6055	Clinical Trials	1
INCL 6056	Clinical and Translational Research Protocol Development	2
INCL 6075	Bioanalytical Methods in Clinical and Translational Research	2
INCL 6085	New Frontiers in Clinical and Translational Research	1
INCL 6095	Clinical and Translational Research	6
INCL 6009	Scientific Communication in Clinical and Translational Research	2
INCL 6017	Introduction to Biomedical Informatics	1
INCL 6008	Health Disparities: A Translational Research Approach	2

Electives recommended by the Program (one semester credit)

INCL 6006	Introduction to Health Services Research	1
INCL 6007	Gender Considerations in Clinical and Translational Research	1

PROFESSIONAL CERTIFICATE IN DATA SCIENCES (ONLINE)

The **Professional Certificate in Data Sciences** is designed for beginners with no statistics or programming experience from different disciplines including, graduate students, academics, healthcare, industry, government, finance, business, and anyone interested in Data Science. The courses will cover the basic of data science, data preparation, data visualization, data modeling and data presentation. The first part of the certificate is the introductory course; a conceptual introduction to the ideas behind turning data into

actionable knowledge. The second part includes Courses 2 to 4 also required to complete the certification in Data Science.

The courses are offered completely online and are self-paced. The student can start the courses at the beginning of every semester. The student in this certificate will learn: (1) Fundamental concepts in Data Science, (2) How to use Data Science Tools, (3) How to collect, clean and analyze data using open source software, (4) How to get and manage real-world data, (5) How to use machine learning to learn models for data, and (6) How to communicate and apply the Data Science knowledge in a real-world project.

The courses methodology includes video lessons, practice exercises, use of software applications, quizzes and articles. The assessments in this course are graded. You must achieve a grade of 70% or higher to pass this course. The assessment strategies include Pre and Post Test, Exercises and Final Project (Certificate will be granted after completion of all assessment strategies including the final project). The student has a minimum of one and a maximum of 1.5 years to complete the professional studies program. This certification is offered through the Continuing Education and Professional Studies Division (DECEP) and does not award an academic degree.

Specific Admissions Requirements

1. Possess a baccalaureate degree or its equivalent in other countries, of a university certified as an institution of higher education with a recommended general average of 2.85 or more (of a maximum scale of 4.00).
2. Have approved a course of three credits of algebra and a course of statistics or biostatistics at university level.
3. You must have mastery of the use of your computer and be familiar with the use of basic personal computer applications.
4. Broadband internet access at home or work.

Graduation Requirements

Students will receive a Professional Certificate in Data Sciences upon meeting the following requirements:

1. Completion of the 8 semester credit hours in required courses with a minimum of A or B,
2. Overall GPA of minimum 3.0 after completion of courses and assessment strategies

PROFESSIONAL CERTIFICATE IN DATA SCIENCES CURRICULUM

Total Semester Credit Hours: 8

DATS 6601	Introduction to Data Sciences	2
DATS 6602	Core Applications in Data Sciences	2
DATS 6603	Applied Data Science with Machine Learning	2
DATS 6604	Data Science Project	2

COURSE DESCRIPTIONS

UNDERGRADUATE COURSES

ANAT 4016 - Topographical and Sectional Anatomy. Two (2) credits
This course is designed to provide a supplementary basis in human anatomy focused towards the specific needs of the Nuclear Technology and Ultrasound student. It deals mainly with the topographic study of the human body, based on the analysis of the transverse sections. It emphasizes identification main anatomical structures by configuration and by relative position to their adjacent structures. Four main areas are covered. In priority order they are: thorax, abdomen, pelvis, head and neck. Analytic process will be based on discussions of diagrams and photographs of transverse sections of the human body. The intellectual skills developed in the course are to be applied on subsequent one and in the clinical practice.

AUXD 2005 - Anatomy and Physiology. Three (3) credits. Pre-requisites: BIOL I and II
This course presents basic concepts in anatomy and physiology and is intended to provide dental assistant student with the knowledge of normal human anatomy and how the body functions in normal situations for recognizing the manifestation of disease and anatomic anomalies.

AUXD 2007 - Oral Histology and Embryology. Two (2) credits. Pre-requisites: BIOL I and II
This course will provide the student the basic knowledge of the primary oral tissues. Emphasis is placed on the study of the microscopic anatomy of oral tissues the embryonic development of the face and the oral cavity. The course is presented by means of lectures and audiovisual aids.

AUXD 2015 - Dental Oral Head and Neck Anatomy. Three (3) credits
This course is designed to develop in the student an integrated knowledge of Dental, Oral and Head, and Neck Anatomy. Basic terminology, anatomical and functional aspects of the head and neck as related to Dentistry and to the dental auxiliary work. A base knowledge of the masticatory system, the morphology and occlusion of teeth and their functional interrelationship is emphasized.

AUXD 2017 - Microbiology Pathology Therapeutics. Three (3) credits. Co-requisites: AUXD 2005, AUXD 2007
This course provides the students with the basic knowledge in Pathology and Microbiology; pathogenic microorganisms and the disease they produce. Emphasis is given to the symptomatology, diagnosis, prevention and treatment of oral diseases. At the end of the course the student will be able to carry out the necessary steps to control contamination and to prevent the spread of disease through the Dental Office and will be able to recognize deviations from the normal and abnormalities of the oral cavity. The course includes basic principles of therapeutics, drug actions as they relate to dentistry.

AUXD 2020 - Psychology. Two (2) credits
Introductory course that offers a historical overview of the evaluation of Psychology as the science that studies the human behavior. Emphasis is given to the discussions of basic concepts pertaining to: individuality of the human being, motivation and personality. Students are encouraged to apply the acquired knowledge to a personal and professional level as well.

AUXD 2025 - Dental Radiology. Four (4) credits
This course familiarizes the student with the principles and procedures needed to expose, process, mount, and interpret intraoral radiographs. Emphasis will be given to the development of accuracy in the technic and professional judgment. The course is presented by means of lectures, demonstrations, and practice in manikins.

AUXD 2225 - Practice Management, Ethics, and Jurisprudence. Two (2) credits
Practice Management, Ethics, and Jurisprudence. Two (2) credits This course is designed to provide the student with a comprehensive knowledge of the administrative procedures included in Practice Management at the Dental Office. The contents and experiences of the course will emphasize the analysis of basic ethical principles related to the professional and personal behavior of the dental assistant. Those principles deal with the ethical issues and problems in the relationship of the dental health team, supervisors, and the patients.

BIOE 4015 - Statistical Methodology. Two (2) credits
Statistical theory and its application to biomedical and health data. The topics included are: Scientific Method, Statistical Method, Procedures for the Collection, Classification, Presentation, and Analysis of Data. The analysis includes the topics of rates, ratios, proportions, and some measures of central tendency.

CIRA 3100 - Human Anatomy I. Three (3) credits. Pre-requisites: none
This undergraduate-level course in radiological sciences is related to other disciplines associated with health sciences. This curricular offer allows the student to acquire the necessary knowledge of human anatomy relevant to the execution of their profession. Among the diversity of topics to be covered in the course, it is distinguished, core aspects of anatomical nomenclature, chemical compositions, cell structure and genetic control. In addition, anatomical systems will be discussed, including skeletal, cardiovascular, respiratory and digestive. The analysis of the topics of the course will allow the student to apply the new knowledge to the radiological sciences. Lectures, collaborative work, oral presentations and other strategies will be used. Upon completion of the course, the student is expected to understand and integrate the fundamentals of human anatomy into the radiological sciences. This course will be offered in the face-to-face modality.

CIRA 3101 – Introduction to Radiological Sciences. Three (3) credits. Pre-requisites: none
The course introduces the undergraduate student to the basic principles of radiation protection, the academic and administrative structure and its relationship to the hospital structure, the principles of quality client services, the history of x-rays, and radiographic procedures and equipment. In addition, the ethical and legal principles associated with the discipline of radiological sciences are studied. It also focuses on the importance and impact of the ethical and legal aspects that regulate the profession, and its relationship with other health professionals. Lectures, discussions, visits to hospital institutions and others will be used to address, discuss and analyze the content of the course. Upon completion of the course, the student should demonstrate a broad understanding of radiological sciences from an ethical, legal, technical, and service delivery perspective. This course will be offered in the face-to-face modality.

CIRA 3102 – Radiographic Exposures. Three (3) credits. Pre-requisites: none
This course is designed to provide the student with the opportunity to know and learn the concepts related to the exposure and production of the radiographic image. Essential concepts such as the electromagnetic spectrum, the production and emission of x-rays, the interaction of x-rays with matter, as well as the formation of the radiographic image, the handling and use of radiographic equipment are discussed. In addition, emphasis will be placed on the analysis of the factors that influence the exposure and quality of the radiographic image, its visual and geometric characteristics. Likewise, the critical evaluation of X-rays is included. The course will use conferences, field visits, collaborative work and others. At the end of the course, the student is expected to demonstrate the competencies of a competent professional capable of producing an X-ray of high diagnostic value. This course will be offered in the face-to-face modality.

CIRA 3103 – Introduction to Radiological Physics. Three (3) credits. Pre-requisites: none
This course the undergraduate student applies various core concepts and principles of physics in the context of a multidisciplinary baccalaureate program in radiological sciences. The focus of the course allows you to study physics applied to radiology. The concepts of physics, matter, exponential notation are discussed; photon properties, mechanics, magnetism and electric current, applied mathematical problems, structure of

the atom and others. Lectures, discussions, collaborative work and others aid the student to understand the content of the course. Upon completion of the course, the student is expected to demonstrate an understanding of the structure of matter and the atom, mechanics and acoustics, electromagnetic radiation, and the production of x-rays. This course will be offered in the face-to-face modality.

CIRA 3105 – Radiographic Procedures I. Four (4) credits. Pre-requisites: none
This course is part of an essential sequential trilogy in the discipline of radiological sciences. The design offers the student the opportunity to learn, practiced, and employ a set of radiographic techniques and body positioning of the upper and lower extremities. Likewise, applicable to positions of the shoulder and pelvic girdle of the human body. The course consists of two phases: a theoretical-conceptual one and another to apply the skills and techniques. Anatomical position, planes, lines and points of reference in relation to the body and medical order are some of the topics to be studied. The course is offered through lectures, demonstrations, simulations, and other strategies. The student is expected to demonstrate the competencies required to apply the techniques and perform the positions and projections necessary to perform diagnostic quality X-rays. This course will be offered in the face-to-face modality.

CIRA 3201 – Digital Image Acquisition. Three (3) credits. Pre-requisites: none
The curricular design of this course is framed in three central axes: digital image, file and communication systems and quality improvement. Through the learning experience, the undergraduate student is related to the modalities of medical images that are produced and sent through a communication and computer network. Among the topics to be discussed are categories of image receptors, matrix of an image, dynamic range, conventional and digital radiology, digital systems, quality control, and others. The course content is studied through lectures, collaborative work, concept mapping, and others. Upon completion of the course, the student must demonstrate a full understanding of the core concepts of digital imaging, quality control, and the discipline's archiving and communication systems. This course will be offered in the face-to-face modality.

CIRA 3204 – Radiological Sciences Pre-Clinics. One (1) credit. Pre-requisites: none
The course is designed for the student to have an approach to their role and professional action in the discipline of radiological sciences. Personal values and professional profile in clinical radiological practice are important topics in the student's training. Other curricular contents to be studied are components of the medical order, operation of radiological equipment, radiological procedures and principles of radiological protection. The student will participate in a clinical rotation program as part of the supervised clinic experience. Lecture, discussion, clinical observations, field visits, and other strategies will be used. Upon completion of the course, the student should understand the responsibilities and scope of the radiology science professional in the practice of the discipline. This course will be offered in the face-to-face modality.

CISA 4009 - Human Relations. Three (3) credits
Basic principles and dynamics of interpersonal relations applied to problems of the Health-Related Professions and its personnel. Theories and evaluation on human relations as well as its present development will be discussed. Examples will be presented and applied to daily living.

CISA 4015 - Psychological Principles Applied to the Health Sciences. Three (3) credits
This course offers Health Sciences students the opportunity to examine basic fundaments of Psychology, study areas, research methods and its implications, emphasizing the practical value in their professional fields. Students will develop concepts, skills and attitudes that foster the holistic understanding of the human being, in order to manage effectively their interaction with the persons they serve, as well as with the health team and themselves. The course was designed with the teaching general strategy of Exploration, Conceptualization and Application (ECA) with the principal aim that students be able to apply acquired knowledge in the Health Sciences, especially in their area of preparation.

CISA 4026 - Educational Methodology for Teaching in the Health Sciences. Three (3) credits
A systematic approach to the design, development, and evaluation of post-secondary level educational activities. Emphasis on the different methods conducive to an effective learning in the Health-Related Professions.

CISA 4031 - Principles of Health Services Administration I. Three (3) credits
Includes the study and analysis of the basic Principles of Administration and the Administrative Process Applied to Health Sciences field. Emphasis on the principles and administrative techniques applicable to the intermediate management level in health services organizations.

CISA 4032 - Principles of Health Services Administration II. Three (3) credits. Pre-requisite: CISA 4031
Includes the study and analysis of the basic Principles of Administration and the Administrative Process Applied to Health Sciences field. Emphasis on the principles and administrative technique applicable to the intermediate management level in health services organizations.

CISA 4035 - Principles of Personnel Administration in Health Care Organizations. Four (4) credits
Includes the study and analysis of the Principles of Personnel Administration in Health Services Organizations. Emphasis on the study of the Government Personnel System.

CISA 4037 - Methods and Instruments of Student Evaluation in Health Sciences. Three (3) credits
Provides the participants with a series of practical and effective techniques for student assessment. Its principal approach is on the development of elements necessary for measurement of cognoscitive, affective, and psychomotor domain. Emphasis on the design, use of methods, and development of measurement instrument in the Health-Related Professions.

CISA 4038 - Seminar and Teaching Practicum. Four (4) credits. Pre-requisites: CISA 4026, CISA 4037, EDFU 3001, EDFU 3002, EDFU 3007
Provides the student teacher with an opportunity to put into practice their knowledge, skills, and self-attitudes regarding education. Practice will be supervised by a specialist of each area of specialist and an educator. Provides for skills comprehension and development on the decision-making process in the Health-Related Professions.

CISA 4048 - Basic Principles of Personnel Supervision. Three (3) credits
This course intends to familiarize the student with the modern theories of supervision. It provides the opportunity for the student to initiate the development of skills that contribute to the effective use of the functions of supervision. Practical exercises and experiences will be utilized so that the student can evaluate himself and initiate a plan of personal improvement or development.

CISA 4055 – Statistical Methodology for Health Professionals. Three (3) credits.
Descriptive Statistics Course with an interdisciplinary approach. Basic concepts of statistics are covered and their relationship with scientific methodology. The collection, classification and presentation of data are studied, as well as the analysis of information through rates, measures of central tendency and dispersion. In addition, the sampling method is introduced. The application of statistics in the field of health is emphasized.

CISA 4065 - Seminar and Practicum in Management. Three (3) credits. Pre-requisites: CISA 4032, CISA 4035
This course emphasizes in the development of concepts, skills and attitudes related to the practice of health services administration. Also, through integrated activities with seminar and practice, the student is face with administrative situations, problems and administrative strategies that are usual in the health institutions. During the practice, the student will work in a project that emphasizes knowledge, skills and attitudes in the analysis and problem-solving process. At the same time, the student is exposed to real administrative

environment of intermediate administration as part of an interdisciplinary team in a health service organization.

CISA 4105 - Educational Technology for Teaching of the Health Sciences Professions. Three (3) credits. Pre-requisites: The student most have evidence of knowledge and basic skills in microcomputers and application programs. The student most have evidence of courses, workshops, and/or skills by means of a test administer by the faculty.
This course will allow the educator in the Health Sciences field to obtain basic knowledge on Educational Technology and develop skills in the operation of educational equipment and the production of instructional materials. The student will have the opportunity to get acquainted with topics on the concept and components of Educational Technology, the systems approach to instructional design, production of instructional materials, operation of equipment, as well as the application of computers and telecommunications in the teaching of the Health Sciences.

CONT 3005 - Introduction to Elements of Accounting I. Four (4) credits
The objective of the course is to familiarize the student with the role of social, political, and economic developments, which have influenced the development of Accounting, as well as with the basic concepts of Accounting, so that he may use accounting data intelligently. The nature of Accounting and its historical development, theory, methods, and uses are considered. Emphasis will be on the meaning, measurements, uses, and limitations of income and other financial information. The needs of management, owners, creditors, government agencies, clients, and employees are considered.

DATS 6601 - Introduction to Data Science. Two (2) credits.
This course provides an overview of Data Science, covering a broad selection of key challenges in and methodologies for working with big data. Topics to be covered include fundamentals in data science, the data science process, data source, collection, tools, integration, management, and informed decision making. This introductory course is integrative across the core disciplines of Data Science, including databases, statistics, data mining, machine learning, and business intelligence. Professional skills, such as communication, presentation, and data visualization, will be fostered. Students will acquire a basic knowledge of data science through hands-on exercises and case studies using Jupiter Notebook for Data Science. Issues of ethics, leadership, and teamwork are highlighted.

DATS 6602 - Core Applications in Data Science. Two (2) credits. Pre-requisites: DATS 6601.
This course provides an overview of basic statistics concepts and tools applied in the data science field. Topics to be covered include statistics tools, R-Studio integration, Phyton integration, Data Science applications, Data Science Toolbox and Linear Regression Analysis. The course focus in the application of quantitative principles and skills to the collection, analysis, and presentation of numerical data.

DATS 6603 - Applied Data Science with Machine Learning. Two (2) credits. Pre-requisites: DATS 6601, DATS 6602
This course will teach the students a wide-ranging set of techniques of supervised and unsupervised machine learning approaches using Python, WEKA and other applications. Machine Learning is a form of Artificial Intelligence that automates data analysis to enable computers to learn and adapt through experience to do specific tasks without explicit programming. Participants will learn how to define a model for your data and make the data learn to predict a range of possible outcomes that account for real-world scenarios.

DATS 6604 - Data Science Project. Two (2) credits. Pre-requisites: DATS 6601, DATS, 6602, DATS 6603.
The Data Science Project course will teach the students the complete process of a Data Science Research Study using Machine Learning. Each student will select one of the variety data sets to complete the project lifecycle. Participants will demonstrate how to define a model for the dataset and make the data learn to

predict a range of possible outcomes that account for real-world scenarios. Results of the analysis must be provided follows the Student Project Guide and Template.

ECON 3005 - Introduction to Economics. Three (3) credits. Pre-requisites: CISO 3121, CISO 3122
Introduction to the theory and application of the fundamental concepts of Economics: historical concepts and perspectives, fundamental problems, methods of analysis, fundamentals of microeconomy and contemporary and future economic problems.

EDFU 3001 - Human Growth and Development I. Three (3) credits
The First Semester will be devoted to an inquiry into the nature of Psychology as background for a better understanding of the educational process. The growth and development of children and adolescent will be examined, as well as the natural and environmental forces, which influence the development of a well-balanced personality. The Second Semester the student will analyze the psychological principles, which underlie the teaching-learning process and the individual and social conditions, which act upon it. Analysis of the process of evaluation and the principles underlying the creation of educational testing and grading.

EDFU 3002 - Human Growth and Development II. Three (3) credits. Pre-requisite: EDFU 3001
Nature and scope of Psychology as a basis for a better understanding of the educational process an examination of the growth & development of children and adolescents and the natural forces and environmental conditions that contribute to the development of a healthy person, main psychological principles that explain the teaching-learning process and how it is affected by individual and social conditions, a study of the evaluation process with special emphasis on principles.
EDFU 3007 - Social Foundations of Education. Three (3) credits. Pre-requisites: CISO 3121, CISO 3122, HUMA 3101, HUMA 3102
Analysis of the basic social science principles in terms of the educational process. Study and discussion of the social problems that have conditioned the development of Education in Puerto Rico.

EDFU 4015 - Foundations of Public Health Education. Three (3) credits
The role of Education in developing basic concepts of Public Health and the means for preserving, improving and promoting individual and community health. Emphasis on public health problems in Puerto Rico, and the contribution of the school and other agencies to their solution. The prevention of illness; environmental sanitation; nutrition, personal, dental and industrial hygiene; safety and first aid; and mental hygiene.

EDFU 4019 - Philosophical Foundations of Education. Three (3) credits. Pre-requisites: CISO 3121, CISO 3122, HUMA 3101, HUMA 3102
Study of philosophical theory and its relationship to pedagogical practice. Presentation of major problems that have been caused by conflicting educational philosophies in terms of their historical development and their present impact. The course emphasizes and clarifies the role of the teacher in regard to educational goals, curriculum programs, and evaluation. Basic philosophical problems such as the meaning of truth, happiness, and their educational implications are analyzed. The course endeavors to promote an understanding of the way in which the development of the Scientific Method, the progress of Democracy, changes in social and economic institutions, and the advancement of human knowledge.

EDSA 4020 Health Promotion. Three (3) credits.
This course discusses the different approaches and models proposed to focus health promotion as the process that allows people to increase control over their health to improve it. The different models, health declarations and strategies proposed will be discussed such as: context approach, environments for community health promotion and community development, interdisciplinary and intersectoral work, health promotion education, health communication for health and health and healthy public policies and social inclusion. Education, prevention and health promotion actions are included, where the population acts in

coordination for public policies, systems and healthy lifestyles, through the advocacy, empowerment and construction of a framed in public health for social support for the determinants of health.

EDSA 4003 - Practical Experience III: Group Intervention in Health Promotion and Health Education Two (2) credits. Pre-requisites: EDSA 4001, EDSA 4002.
This course offers the student the opportunity to design and develop the first educational activity with a community group in a real scenery. In addition, they could practice skills like coordination among agency personnel and moderator of educational activities, among others.

EDSA 4004 - Practical Experiences IV: Intervention in Health Promotion and Health Education. Seven (7) credits. Pre-requisites: EDSA 4003. Co-requisite: EDSA 4014.
This course offers the student the opportunity to develop the skills of planning, implementation and evaluation of health promotion and health education programs with real populations based on the theories, models and effective practices in this field. Practice the analysis of the findings of social, epidemiological, behavioral and educational assessments and social determinants of health, to design interventions to improve the quality of life, daily living conditions and disparities in health care.

EDSA 4013 Educational Process in Health Promotion and Health Education. Four (4) credits. Pre-requisites: EDSA 4011, EDSA 4012.
In this course, primary importance is attached to the analysis of the central theme of health education: the educational process. Emphasis is given to the fact that health education is a fundamental element of health promotion. The educational process is analyzed in depth. The student is guided to understand basic concepts such as learning, education, health education, learning styles, factors that facilitate and limit learning, learning theories and what it means and represents the formulation of educational objectives. Another significant contribution to the professional training of the student is the inclusion in topics such as the biological basis of learning and its relationship with the functioning of the brain. It begins with the ability to design educational interventions with particular emphasis on information and communication technologies (TIC) as means of expression and creation.

EDSA 4014 - Fundamentals in Planning of Health Promotion and Health Education Programs Four (4) credit. Pre-requisites: EDSA 4013.
This course is designed for students who start planning health promotion and health education programs. By examining different planning models, the student develops knowledge and skills for program planning, regardless of the scenario in which they are going to implemented and the field of their professional performance. The opportunity is provided to design multi-strategic interventions that cover all the elements of health promotion to highlight health education. The phases of planning, implementation and evaluation are analyzed. This process is carried out through readings, group discussions, interviews, observations in the field, study groups, cooperative learning, among others. These experiences, together with several theoretical concepts, are complemented within the framework of the direct experience of carrying out the processes in a real scenario with specific populations.

EDSA 4046 - Introduction to Research. Three (3) credits. Co-requisite: CISA 4055
The course aims to develop in the student general knowledge about research. It includes: applying the scientific method to the research process, and distinguishing between the quantitative and qualitative approach. Presents the relationship between the type and research design. It demonstrates how to search and identify reliable documents on the internet. It is related to different instruments to collect data and computerized statistical packages. Discuss the design of tables and graphs and the preparation of the final research report as established by APA. It requires the design of a research proposal.

EDSA 4047 - Use of Technologies of Information and Communication in Health Promotion and Health Education Three (3) credits.
The course examines the historical development, technological principles and the use of Information and Communication Technology (TIC) in Health Promotion and Health Education. Likewise, the theoretical foundations to be used in the design of instructional materials are studied. It is also study the refinement of technical skills and the development of ethical competences (netiquette) in the use of TIC. Finally, instructional materials and tools are designed and created to be used in the roles-play in health promotion and education.

EDSA 4050 Communication for Public Health. Three (3) credits.
The course focuses on the Public Health mission, in the principles of health promotion and in the theories of personal and community change within the ethical foundations of the health education profession. Sponsors effective public policies to achieve health goals. It considers communication for health as a form of intervention where promotion, empowerment and social participation are individual and social action strategies that allow us to assume challenges in health needs and adopt healthy practices and lifestyles. Educational experiences allow students to evaluate, integrate designs, and apply models of health communication programs, use new information and communication technologies (NTIC) and social networks. Ethical foundations and cultural sensitivity are used to facilitate credibility and trust in the audiences to make effective decisions about health.

EDSA 4051 Fundamentals of Interventions in Health Promotion and Health Education. Three (3) credits.
In this course, the philosophical and ethical frameworks on which interventions in Health Promotion and Health Education are based. The process of change is explored in light of the magnitude and speed of its occurrence in a globalized world, and how these affect the intervention in on Health Promotion and Education. The most used theories, models, and methodologies to carry out the interventions are discussed. Finally, the relation between paradigm, philosophy/ethics, theories and theoretical models and methodologies is conceptualized.

EDSA 4052 Practical Experience I: Public Health and the role of the Health Educator. Two (2) credits.
This component of the practical experiences focuses in the observation, discussion and interventions of different aspects related to public health, health promotion and health education. The student participates gradually in the development of group techniques and activities in which is provided the opportunity to work as a co-facilitator. Course activities include study visits to different health institutions, programs and projects in the various sectors related to social determinants of health. The course emphasizes in health scenarios, planning, development and evaluation of health promotion activities, health education and health maintenance activities that serve various groups.

EDSA 4058 - Sexual Health Promotion Three (3) credits.
In this course, human sexuality is analyzed from an integral vision with a biological, psychological and sociocultural perspective. The development of positive attitudes and respect for diversity within human sexuality is promoted and analyzed as an integral component of personality. It incorporates elements such as cybersex, use of social networks, sexual texting and its impact on the manifestation of sexuality in our societies.

EDSA 4059 - Nutrition and Physical Activity Three (3) credits.
This course presents the concepts of nutrition as science and its application integrating topics such as metabolism, adequate food, diet therapy, food handling and feeding problems of the individual and the Puerto Rican community. It also includes the importance of physical activity in the integral health model. The student will be able to integrate theoretical and practical exercises, in the self-evaluation and communal

evaluation of the nutritional status and of the profile of the physical activity carried out. The course methodology includes face-to-face activities such as through distance learning platforms.

EDSA 4067 - Priority Health Problems in Puerto Rico. Three (3) credits.
This course directs the student to evaluate priority health problems in Puerto Rico, such as drug addiction and Acquired Immune Deficiency Syndrome (AIDS). Analyze critical issues and place students in their professional roles as community health educators. Challenge students to reflect, clarify their values, attitudes, and make logical and reasoned decisions about the health problems analyzed.

EDSA 4154 Social Determinants of Health. Three (3) credits.
This course is designed with the objective of identifying and analyze health and social determinants of health in the context of Health Promotion. The student is guided in the reformulation of the health concept and in the analysis of the elements that comprise it. The field experience that they will carry out requires making a community profile that initiates them in the ability to identify determinants of health and a need assessment in a population assigned. Through group discussion, forums, readings, debates and interviews, students will evaluate the health impact of the social determinants. The student will propose transectoral and interdisciplinary efforts as well as interventions to reduce the impact of social determinants of health and eliminate inequalities.

EDSA 4155 Mental Health Promotion. Three (3) credits. Pre-requisites: EDSA 4020.
The course begins with the presentation of concepts and constructs associated with the Mental Health Promotion. It investigated the normative and perspective in the documents of health promotion and mental health promotion. The development of the concept of positive mental health is explored. The levels of disease and intervention in mental health are studied. Equal actions and scenarios for the mental health promotion at a global level. Finally, health education activities are created using mental health promotion topics.

EDSA 4156 Individual Interventions in Health Promotion and Health Education. Three (3 credits). Pre-requisites: EDSA 4051.
The course begins with the explanation of the concepts associated with individual interventions in Health Promotion and Health Education. The models and theories, which underlie individual interventions, are studied. The types of individual interviews that can be conducted are explored and analyzed the different ones that can be used. Finally, the course examined the scenarios and topics related with individual interventions in Health Promotion and Health Education.

EDSA 4157 Group Interventions in Health Promotion and Health Education. Three (3) credits. Pre-requisites: EDSA 4051.
The course begins with the examination of the development of the concept "group" through time. Then the typifications of groups are then studied according to their differentiation, characteristics and classification. The behavioral dynamics of the groups are valued, from the perspective of their formation and underdevelopment. The roles facilitation and co-facilitation, processes and techniques to be used in-group interventions for Health Promotion and Education are inquired and exemplified.

EDSA 4158 Practical Experiences II: Individual Intervention in Health Promotion and Health Education. Three (3) credits.
This component of the practical experiences examining and critically reflect and carrying out individual interventions in Health Promotion and Health Education. Emphasize in planning, development and evaluation of individual interventions in scenarios of health care system with different populations. The student participates in the assessment of individual needs that serves to facilitate the design of plans whose primary

objectives will be the development of skills, behaviors, attitudes towards self-care and generation of healthy lifestyles in people with cultural diversity.

EDSA 4401 Social Participation as a Strategy for Health Promotion and Health Education. Three (3) credits.
This course analyzed theoretical foundations of social participation. This strategy is used to raise awareness about individual and collective responsibility for the preservation of health as an important element to achieve behavioral changes and avoid risk behaviors. Social participation is a link in the chain of actions that integrate health promotion. This is a theoretical and practical course in which students observe and interview in the field government employees, community leaders and volunteer staff from different organizations, among other scenarios. These activities are complemented by the use of technology and other educational methodologies. International pronouncements and their commitment to citizen participation are analyzed.

EDSA 4403 Evaluation of Health Promotion and Health Education Programs. Three (3) credits.
This course highlights the evaluation models of Health Promotion and Health Education programs of the educational process; at the individual, group and community level. Different theoretical frameworks, models and program evaluation designs are presented. It will discuss basic concepts of appraisal, formative evaluation, summative evaluation, and measurement. The purposes and principles that inform the evaluation of learning are explained, as well as analyze the different evaluation techniques and instruments and their application in the evaluation of cognitive, affective and psychomotor aspects in Health Promotion and Health Education programs. The role of evaluation in the process of educational decision making by the health educator and the learner is analyzed. The ethical aspect is incorporated into this process. It is discussed how evaluation should be an integral part of the design and development of any program or intervention that seeks to alleviate or solve problems related to people's quality of life.

EDSA 4402 Social Marketing. Three (3) credits.
This course challenges students to analyze, evaluate and reflect on social marketing strategies and their application to the ethical principles of the health education profession. Through educational experiences with a critical and creative thinking approach, students are trained to reflect on the theoretical models, principles and techniques of social marketing. They integrate the democratic models of social participation and the ethical foundations of health professionals to the social marketing models necessary to achieve the objectives of health and welfare promotion. The course punctuates social marketing in the audiences selected in the change process. He considers them as thinking, reflective, creative beings, capable of making informed decisions to achieve health and well-being. The use of new information and communication technologies (NTIC) in social health marketing is analyzed.

ENFE 1035 - Applied Nursing. Two (2) credits.
The study and application of basic nursing procedures sterile technics, catheterization, principles of enema, administration, and the basic cardiopulmonary resuscitation.

EPID 4201 - Introduction to Epidemiological Methodology. Three (3) credits. Pre-requisite: CISA 4055.
This course was design especially for students of the Health Education Program. The course objectives and the educational methodology to be used have been designed taking into consideration the previous preparation of the students, especially those developed through the introductory courses. It aims to initiate the student in the study of epidemiology as a science necessary for the study of health programs.

FINA 3005 - Introduction to Insurance. Three (3) credits.
Problems inherent to the insurance field and its influence on the individual, on the economy and on society. Different techniques that can be used to deal with high risk. The handling of insurable risks through insurance policies, and the relationship of risk and public policy.

FINA 3006 - Business Finance. Three (3) credits. Pre-requisites: ECON 3007, CONT 3006.
A study of the process of raising, administering, and distributing the funds of an enterprise. A study of different types of businesses with special emphasis on the modern corporation. Analysis of the stages of promotion, organization, expansion, and liquidation of the corporation.

INTD 2005 - Introductory Biomedical Sciences Core Course. Five (5) credits.
Introductory course in the study of the human body composed of ten units: Cellular Biology, Tissues, The Muscular Skeletal Systems, The Nervous System, The Cardiovascular and Lymphatic System, The Respiratory System, The Urinary System, The Digestive System, The Reproductive System, and The Endocrine System. Provides the student the opportunity to think of the human organism as a global and integrated functional unit.

INTD 4005 - Health: A Holistic Approach. Five (5) credits.
Introduces the student to the concepts of Health and Public Health and to his professional role as a member of the interdisciplinary health team. Various fundamental processes utilized to study the health level in a community are examined. Several of Puerto Rico's health problems, are discussed and the main given to health education, legislation and health alternatives for the promotion and maintenance of individual and collective health.

INTD 4006 - Cultural Influence and Folk Health Practice of the Puerto Ricans. Three (3) credits.
An interdisciplinary course with a humanistic approach designed to aid the student in his or her understanding of those aspects of man and its culture that influence health attitudes and practices. Particular attention is given to the folk health practices of the Puerto Ricans. Includes analysis and discussion concepts and ideas from the field of the Humanities and the Cultural Sciences as they relate to situations faced by the health professional.

INTD 4008 - Trends and Controversies in the Health Professions. Three (3) credits.
Places the student in the Health-Related Professions educational setting. Clarifies the Health Sciences concept and studies its evolutionary development up to and including its present status. Analysis of the current controversies in the health field.

INTD 4015 - Community and Mental Health. Two (2) credits.
Studies different factors related to Community Mental Health. Analyses strategies for the promotion and maintenance of individual and Community Mental Health.

INTD 4016 - Addiction Problems in the Puerto Rican Society. Two (2) credits.
An overview of the addiction problems in the Puerto Rican Society. Emphasis is placed in alcoholism and smoking problems. Discuss the implication of these problems for the individual, the family, and the community. Analyses the factors related to these problems and specific intervention strategies for these cases.

INTD 4017 - Biomedical Core Course. Six (6) credits.
In this course, the anatomic structures and physiological processes of the human body system are studied. In addition, the course provides clinical correlation by the discussion of pathologies, medical disorders and conditions, which affect the structures, and function of the human body. The student will analyze the basic clinical correlations and adapt them to their respective Health Sciences area.

INTD 4018 - Gerontology: An Interdisciplinary Approach. Three (3) credits.
This course explores the aging process using an interdisciplinary approach. The biological, social, and psychosocial problems of our senior citizens will be discussed. Emphasis will be given to myths, stereotypes,

realities, and health services available to the aged. The interdisciplinary role of the health professional in offering services for the aging will be closely examined.

INTD 4020 - Introduction to Computers. Three (3) credits.
Students will acquire basic knowledge and skills in computer literacy. General aspects, terminology, and use of computers will be discussed. Including historical background, hardware, and software. Opportunity will be provided to apply knowledge and skills through the use of microcomputers. Emphasis will be placed on the use and application of a wide range of programs (software) most commonly used in the Health Science field.

INTD 4025 - Microcomputers Applied to Health Sciences. Three (3) credits. Pre-requisite : INTD 4020 or its equivalent.
This course provides the student, who has previous experience with microcomputers and interest in increasing knowledge and developing new skills with computers, the opportunity to work with a variety of software packages used in the Health Sciences field. The students will apply theoretical concepts and develop skills that will permit them to operate and use correctly the equipment ("hardware") and the programs ("software"), through the use of a hands-on practical experience approach with the microcomputer.

INTD 4027 - Human Values and Ethics in the Training of the Health Professional. Three (3) credits.
Study of the values system and ethical issues on health care, such as the right to life and death, genetic manipulation, discrimination in the quality and quantity of health care. Emphasis on the codes and ethics on professional behavior.

INTD 4065 - Introduction to Violence Prevention in Children & Youth. Three (3) credits.
This interdisciplinary course promotes interaction between future health professionals to develop knowledge, skills and attitudes in areas related to violence prevention in children and youth from 0-24 years. In the course, violence is considered as a public health problem in the Hispanic and Puerto Rican Society. The etiology and epidemiology of violence as well as the risk and biopsychosocial protective factors that protect children and youth from violence are analyzed. The roles and responsibilities of health professionals in violence prevention, effective techniques, and projects and community programs that are effective for this matter are examined. Educational methodologies, such as discussion, projects and cooperative learning are used as a mean of facilitating the course.

INTD 5006 - Interdisciplinary Health Team Experience. Three (3) credits.
Field experiences with concurrent daily sessions for the development of the team, including analysis of the team concept, team characteristics, group dynamics, communication patterns, others. The conceptual framework of this course evolves around the development of a special project, which can be of a clinical, community or organizational nature. Instructional methodology will include group exercises for teamwork skill development, group discussions and development, group discussions and development of a special project.

INTD 5116 - Incorporation of Technology in the Designing of Educational Activities. Three (3) credits.
This is a multidisciplinary course created for undergraduate and graduate students. The course exposes students to the basic concepts of teaching learning and develops skills in the use of technology for the development of educational activities relevant to the discipline of the student. The course will discuss topics as: planning and implantation of educational activities and the use of computerized programs of word processing and design of presentations, for the creation of articles and poster boards as educational materials.

MEDU 4006 - Core Course in Biomedical Sciences. Seven (7) credits.
This course provides the medical technology student with the tools and knowledge necessary to act efficiently as a microbiologist in the clinical laboratory. Emphasis will be placed on the technical procedures used to isolate and identify pathogenic microorganisms to humans. Provides the medical technology student with the tools and knowledge necessary to act efficiently as a microbiologist in the clinical laboratory. Emphasis will be placed on the technical procedures used to isolate and identify pathogenic microorganisms in humans.

MICR 4006 - Medical Bacteriology. Seven (7) credits.
Microbiology and Immunology with emphasis on technical procedures used in the isolation and identification of bacteria, viruses, and fungi pathogenic to man. Lecture and laboratory.

PAXD 2010 - Introduction to General and Dental Specialties Procedures. Two (2) credits. Co-requisites: PAXD 2015, PAXD 2016, PAXD 2017.
This course consists of lectures designed to develop knowledge of the most common restorative and specialty procedures in the various areas of dental practice and its relationship with the dental auxiliary role. It includes, also, nomenclature, terminology, instrumentation, and the sequence of the procedures.

PAXD 2015 - Dental Materials. Two (2) credits. Co-requisites: PAXD 2010, PAXD 2016, PAXD 2017.
This course is designed to provide students information about nomenclature, characteristics, physical and chemical properties of dental materials. The laboratory emphasizes the development of skills in the manipulation and application of materials commonly used in the clinical practice of Dentistry. The materials include: gypsum products, impression materials, cements, metals, amalgams, composite resin, sealant, abrasives, synthetic resin denture materials and waxes.

PAXD 2016 - Dental Instruments. Two (2) credits. Co-requisites: PAXD 2010, PAXD 2015, PAXD 2017.
This course consists mostly of conferences and laboratory experiences to enable students in the identification and use of dental instruments. It will also include hand instruments that require manual effort to operate or rotary instruments, which are placed in some type of handpiece or rotary device. Emphasis will be placed in developing skills, such as assembling and maintaining the sequence of instruments on the preset trays, following four handed dentistry principles and infection control protocol.

PAXD 2017 - Chairside Assisting and Basic Clinical Procedures. One (1) credit. Co-requisites: PAXD 2010, PAXD 2015, PAXD 2016.
This course consists of lectures and laboratory experiences to enable the dental assistant in current concepts of Chairside Assisting and Chairside Clinical Supportive Functions, which are part of general Dentistry procedures. Emphasis will be placed in applying current concepts of Chairside Assisting in a modern Dental Office, instruments transfer techniques, and the use of different oral evacuation systems during routine operative and surgical procedures. The use of universal precautions in the prevention of cross contamination will also be included.

PAXD 2018 - Expanded Functions in Preventive Laboratory. Two (2) credits. Co-requisites : PAXD 2010, PAXD 2016, AUXD 2017.
This course introduces the student to basic Preventive Dentistry terminology and procedures and enable the student to understand the process of caries formation and initiation of periodontal disease. It also includes evaluation of different measures and procedures available to prevent oral diseases, and their application on a particular patient. The laboratory provides experiences necessary to develop proficiency in this field. Included are the most basic Preventive Dentistry procedures, such as: educational strategies, mechanical and chemical methods of plaque control, care of removable appliances and prosthesis, fluorides, sealants, desensitizing agent and others.

PAXD 2024 - Expanded Functions in Preventive Dentistry Clinic. Two (2) credits. Pre-requisite: PAXD 2018.
A general exposition to programmed progressive experience in the execution of basic preventive procedures, such as: the use of ultrasonic scaler, polishing coronal surfaces including dental implants, fluoride treatment and sealants. It will also include the development of skills in basic instrumentation and infection control procedures in order to develop proficiency and quality performance in this field.

PAXD 2029 - Expanded Functions in Restorative Laboratory. Three (3) credits.
This course introduces the dental assistant to programmed progressive experiences necessary to develop the basic skills in the most common restorative operative procedures in order to develop proficiency in this field. It will also include live demonstrations and laboratory practice on a manikin. Emphasis is placed in the utilization and correct manipulation of instruments and materials during the different restorative projects and body positioning for gaining access to all areas of the oral cavity.

PAXD 2030 - Expanded Functions in Restorative Dentistry Clinic. Three (3) credits. Pre-requisite: PAXD 2029.
A general exposure to programmed progressive experiences in the execution of the most common restorative operative procedures in order to develop skills and proficiency in this field, utilizing four handed Dentistry concepts. It will also include practical experience performing basic business office procedures.

PAXD 2101 - Clinical Practice I. Four (4) credits. Pre-requisites: PAXD 2010, PAXD 2015, PAXD 2016, PAXD 2017, AUXD 2025.
This course provides the dental assistant the practical clinical experiences related to Chairside Assisting in dental and hospital procedures. The student is also provided with the clinical experiences necessary for exposing and processing intraoral radiographs in a variety of patients. Emphasis will be placed on patient management in order to ease performance by better patient-operator relationship. Clinical practice will be performed in dental clinical sites, such as School of Dentistry, program facilities, Medical Center, and Veterans Hospital.

PAXD 2102 - Clinical Practice II. Four (4) credits. Pre-requisite: PAXD 2101.
This course provides the dental assistant the extramural clinical experience related to Chairside Assisting, radiographic and basic business office procedures. The clinical assignments are designed to expose the student to the realities and pressures of a dental office or hospital dental clinic and how to cope with stress associated with those clinical settings. It will also emphasize the quality and variety of experiences gained in each assignment as well as the quantity of functions performed. Clinical rotations will be performed in private dental offices, and Medical Sciences Campus clinical site.

SAAN 4026 - Comparative Anatomy of Domestic Animals. Two (2) credits.
This course will cover the study of microanatomy and macroanatomy of the most important domestic animals. The main model will be the dog. The fundamental anatomical variations will be compared between the canine, porcine, equine, avian, and bovine. Anatomical and medical terms related to animals will be studied. Audiovisual resources, cadavers for dissection, and laboratory experiences will be utilized.

SAAN 4027 - Physiology of Domestic Animals. Two (2) credits.
A study of the function of the following systems with reference to their clinical importance: Circulatory, Nervous, Urinary, Skeletal, Respiratory, Muscular, Endocrine, Lymphatic, and Reproductive. The physiological and medical terminology related to animals will be studied. Audiovisual resources, models, and laboratory experiences will be utilized.

SAAN 4029 - Dog and Cat Nutrition. One (1) credit. Pre-requisites: SAAN 4027, SAAN 4085.
This course provides basic knowledge in the areas of nutrition of the dog and the cat. Nutritional differences between both species will be discussed. Different types of commercial pet foods will be discussed, including characteristics, and marketing of the product. Prescription diets will also be discussed. This will be accomplished by lectures and practical exercise.

SAAN 4036 - Introduction to Animal Health Technology Science. Two (2) credits.
An introductory course for the beginning student as an orientation to the principles of animal health technology. The professional interrelationship between the veterinary doctor and the animal health technologist, as well as career opportunities, duties, laws, and ethics as pertains to the paramedical veterinary personnel in the Veterinary Science field will be studied.

SAAN 4047 - Introduction to Pharmacology. Three (3) credits. Pre-requisite: SAAN 4027.
Study of the major classification of drugs, with selected samples of their functions and effects on animal systems. Knowledge of the basic terminology, usage, routes of administration, toxicity and hazards, sources, and storage of drugs.

SAAN 4059 - Veterinary Microbiology. Three (3) credits. Pre-requisites: General Biology, General Chemistry, Organic Chemistry.
This course includes basic principles in Microbiology and its applications to Veterinary Medicine. The students will study the different groups of microorganisms by its morphology, staining characteristics, motility, nutritional requirements, and metabolism. It will include basic principles of Mycology, Virology, and Milk Microbiology. This will be accomplished by lectures and laboratory experiences.

SAAN 4060 - Animal Diseases. Three (3) credits. Pre-requisites: SAAN 4026, SAAN 4027, SAAN 4059.
This course familiarizes the student with the most common infectious diseases in canines, felines, equines, porcine, bovine, poultry, and laboratory animals. The principal characteristics of the diseases such as etiological agent, clinical signs, control, and prevention methods of the disease will be discussed. This will be accomplished by lectures, clinical cases discussion and group discussions.

SAAN 4067 - Principles of Veterinary Parasitology and Entomology. Two (2) credits. Pre-requisites: SAAN 4026, SAAN 4027.
A study of the most important ectoparasites and endoparasites of domestic animals, including identification, life cycle, pathogenecity, laboratory diagnosis, control measures, pathology and economic and public health importance.

SAAN 4069 - Epidemiology and Zoonoses. Three (3) credits. Pre-requisites: SAAN 4059, SAAN 4060, SAAN 4067.
In this course, the student will study transmissible diseases from animals to men (Zoonoses). These Zoonoses will be discussed in terms of their frequency, etiological agent, geographical distribution, transmission mode, and incidence, clinical signs in the animal and in men, diagnosis and treatment. Special attention will be given to the control and prevention of disease. Additionally, it will include the concept of epidemiological research, where the diagnostic process, data collection, its analysis, and the experimental and descriptive methods related to research are examined. At the end of the course, the student will apply his acquired knowledge to accomplish his/her role in animal and public health maintenance. The objectives will be accomplished through lectures, demonstrations, group discussions, audiovisual materials and laboratory exercises.

SAAN 4078 - Food Sanitation. Four (4) credits. Pre-requisites: SAAN 4059, SAAN 4060.
At the end of this course, the student will be able to discuss basic concepts of food sanitation and identify the most common sources of food contamination. In addition, will identify methods of sanitation and food

preservation. Students will understand and interpret laws and regulations related to food production, manufacture, storage, and distribution. He will also recognize symptomatology of food borne disease and will develop practical techniques of food conservation and safety.

SAAN 4085 - Introduction and Management of Farm Animals. Six (6) credits.
The study of the common breeds and characteristics of domestic animals, including dogs, cats, swine, sheep's, goats, horses, beef cattle, dairy cattle, and poultry. Fundamental concepts of animal nutrition, feeding, selection, breeding, and consumption patterns as related to economics. This course provides students the opportunity to familiarize with the most important domestic animals and to observe modern facilities for their use in a successful operation.

SAAN 4101 - Field Experience I. Two (2) credits. Pre-requisites: SAAN 4026, SAAN 4027, SAAN 4036, SAAN 4085.
This course is the first of a group of three in Field Experience with animals such as beef cattle, dairy cattle, dogs, cats, laboratory animals, exotic animals, pigs, poultry, primates and other pets. The course includes field experience in Clinical Pathology and food products laboratories. The student will assist to three (3) of eight (8) centers designed by the Animal Health Technology Program.

SAAN 4102 - Field Experience II. Two (2) credits. Pre-requisite: SAAN 4101.
This course is the second of the block in Field Experiences. This course provides first-hand experience with animals such as: beef cattle, dairy cattle, dogs, cats, laboratory animals, exotic animals, pigs, poultry, primates and other pets. The course includes field experience in Clinical Pathology and food products laboratories. The student will be assigned to six (6) practice centers designed by the Animal Health Technology Program, not visited in Field Experience I. This course is followed by the practicum in Animal Health Technology.

SAAN 4105 - Practicum-Animal Health Technology. Six (6) credits. Pre-requisite: SAAN 4102.
This is the third course and last section of the block making up Field Experiences. In this course, the students will select one of the nine (9) centers for practice visited in previous courses, Field Experience I and Field Experience II. The purpose is to increase and develop their knowledge and skills in one particular area related to Animal Health Technology.

SAAN 4113 - Veterinary Clinical Analysis I. Three (3) credits. Pre-requisites: SAAN 4027, SAAN 4059.
This course is designed to prepare the animal health technologist with the basic principles for the establishment, administration, and operation of a Veterinary Clinical Laboratory. The course focuses on the logic behind the many laboratory procedures performed in veterinary practice and how these are performed. Discusses theory, clinical importance, methodologies, quality control, instrumentation, normal values, differences between species and the associated pathologies in the following areas: Urinalysis, Urolithiasis, Clinical Parasitology, Clinical Hematology, Coagulation and miscellaneous laboratory tests. At the end of this course, the animal health technologists will practice and understand the laboratory clinical procedures, their relationship with the physiological changes in sick animals, and their variations by species.

SAAN 4114 - Veterinary Clinical Analysis II. Four (4) credits. Pre-requisite: SAAN 4113.
This course is designed to prepare the Animal Health Technologist student with the basic principles for the clinical analysis of samples from different animal species. The course focuses the role of the animal health technologist in the laboratory procedures performed in veterinary practice. In addition, the analysis can help the veterinarian to confirm a clinical diagnostic. In the course we discuss the theory, clinical importance, methodologies, quality control, instrumentation, normal values, differences between species, and associated pathologies in the following areas: Clinical Chemistry, Immunology, Serology, Cytology, and others miscellaneous laboratory tests. At the end of this course, the student will practice and comprise the

laboratory clinical procedures, their relationship with the physiological changes in sick animals, and their variations by species.

SAAN 4115 - Laboratory Animal Management. Three (3) credits. Pre-requisites: SAAN 4047, SAAN 4067, SAAN 4120.
The animals considered in this course are those most frequently encountered in the laboratory situation; the greater proportion of the study being confined to the more common laboratory mammals. The primary objective is to discuss the principles involved in the healthy maintenance of animals in the laboratory or animal house. The student must be aware about the environmental requirements, physiological data, and techniques of husbandry, involved in the care and use of laboratory animals.

SAAN 4116 - Veterinary Radiology. Three (3) credits. Pre-requisite: SAAN 4026.
This course familiarizes the student with basic concepts of Radiological Sciences. The discovery of X-Rays, their production, use and management will be discussed. They will learn applied terminology, and how the radiological image becomes visible. The student will learn radiographic techniques and correct positioning. The student will apply this knowledge in real situations provided practical laboratory experiences utilizing different animals.

SAAN 4120 - Animal Nursing. Four (4) credits. Pre-requisites: SAAN 4026, SAAN 4027, SAAN 4085. Co-requisites: SAAN 4047, SAAN 4059.
This course will prepare the student for their nursing role in the general care of the hospitalized and the walk inpatient. The student will perform: nursing procedures, such as fluid administration, taking laboratory samples, catheterization, care of wounds, bandages, nutrition, dental hygiene, and client education.

SAAN 4125 - Surgical Assistance. Four (4) credits. Pre-requisites: SAAN 4026, SAAN 4047, SAAN 4120.
This course will provide the student with basic concepts related to surgical assistance needed in the surgical room. Basic principles of asepsis, management of the equipment and surgical instruments, suture materials and suture patients are studied and applied. Additionally, the tissue healing process, surgical emergencies, the pre-operatory period, pre-anesthesia, and the different types of surgical anesthesia are discussed. The student will learn the correct use of the anesthesia machine, will study and practice anesthesia monitoring, and the care of a patient during the post-operatory period. The last part of the course will provide hands on laboratory experiences where the student will accomplish his/her role as anesthetist and surgical assistant in several surgeries.

SAAN 4130 - Veterinary Hospital Management and Computerized Records. Four (4) credits. Pre-requisite: SAAN 4036.
This course covers managerial processes that are essential to the successful operation of the veterinary hospital. The student should analyze the basic principles underlying the management of business organization including the patient management considering the relation between the patient and the client. The student will be involved in the veterinary hospital design to guarantee functionality. Additionally, he/she will design and evaluate different kind of records in the veterinary hospital. The student will recognize the importance of handling records correctly for the adequate management of veterinary practice. This course includes a basic introduction to personal computers programs especially designed for veterinary hospital.

TENU 4135 - Nuclear Physics. Two (2) credits.
Study of the elementary aspects of the structure of matter, the modes of radioactive decay, the interaction of radiation and matter, the principles of radiation detection, basic principles of sound waves, and its interaction with matter. The student will be able to apply the basic principles involving Nuclear Physics, radioactivity, radiation detection and sound waves to practical situations in the Nuclear Medicine and to

perform calculations involving radiation dose and radioactive decay, and to apply these to Nuclear Medicine problems.

TENU 4145 - Statistics in Nuclear Medicine. One (1) credit.
The student should be able to apply statistical methods in the analysis and interpretation of Nuclear Medicine data. Specific procedures related to the radioactive decay process, interpretation of time activity histograms and interpretation of quantitative laboratory data would be emphasized.

TENU 4177 - Radiation Protection and Radiobiology. Two (2) credits.
This course introduces the student to the proper handling of radioactive materials. The cellular and tissue effects of ionizing radiation, acute and chronic radiation syndromes will be considered. It presents the therapeutic applications of radionuclides, the techniques for measuring environmental radiation levels, detection of radioactive contamination, techniques of decontamination and radiological protection. Government regulations relating to exposure and material handling are covered.

TENU 4185 - Radiopharmacy and Radionuclide Chemistry. Two (2) credits.
The production of radionuclides, design and use of radionuclide, generators, formulations of radiopharmaceuticals, mechanisms of tissue localization of various agents and quality assurance procedures are discussed. The student will be able to apply Radiopharmacy procedures and Radiochemistry principles to specific clinical and research problems in Nuclear Medicine.

TENU 4195 - Radioassays. Two (2) credits.
Includes principles of Immunology, principles, techniques, and interpretations of in-vitro clinical procedures, including saturation analysis and competitive protein binding. Laboratory experience using the instrumentation necessary for these procedures is provided. The student will be able to perform specific radioassay and radioimmunoassay procedures.

TENU 4205 - Instrumentation in Nuclear Medicine and Ultrasound. Two (2) credits.
The operating principles of Nuclear Medicine and ultrasound instrumentation are presented. The student should be able to use properly, calibrate, standardize, operate, and do basic troubleshooting for clinical imaging instrumentation, such as scintillation cameras, scanners, ultrasound imaging units and laboratory equipment, such as gamma and beta counters and radiation survey meters.
TENU 4215 - Administration of a Nuclear Medicine Facility. One (1) credit.
Different aspects of the administration of a Nuclear Medicine laboratory and clinic are discussed. The student should be able to apply basic concepts of administration and management to a Nuclear Medicine Department, including record keeping, quality assurance programs, safety procedures and other licensing requirements of regulatory agencies.

TENU 4225 - Seminar. One (1) credit.
A diversity of topics related to Nuclear Medicine Technology are presented with the participation of students and all teaching staff. The student will perform a literature review and prepare a written paper and an oral presentation, on a subject of interest in Nuclear Medicine or Diagnostic Ultrasound Imaging.

TENU 4235 - Clinical Practice. Ten (10) credits.
Supervised experience in the hospital is provided, including radionuclide imaging, in vitro procedures and some experience on diagnostic ultrasound imaging. A one-hour weekly discussion period is provided to discuss clinical diagnostic procedures not included in other courses. The student will perform, under supervision, a diversity of diagnostic procedures, including required quality assurance and radiation protection procedures.

TENU 4245 - Computer Application in Nuclear Medicine. One (1) credit.
The principles of operation of digital computers are presented, including digital concepts, analog to digital conversion, data acquisition systems, and the basic concepts of the hardware and software used in Nuclear Medicine. The student will be able to apply these concepts in the data acquisition and analysis of clinical studies.

TENU 4265 - Nuclear and Ultrasound Imaging. Four (4) credits.
Study the principles of radionuclide and sonographic imaging procedures of human organs, regions, and systems. With the different organs, regions, and systems it includes the methodology and assessment of function in studies, applications, limitations, normal and abnormal patterns, and technical pitfalls.

TEOF 2006 - Ocular Anatomy and Physiology. Four (4) credits.
In this course, the student will study the anatomy and physiology of the ocular system, including nomenclature and definitions. The course covers the composition, location, and function of each part of the eye and its relation with other body structures. This course also covers basic study of general anatomy to expand the knowledge of the students, regarding the relation between ocular conditions and the body systems.

TEOF 2007 - General Concepts in Optics and Refraction. Three (3) credits.
This course will introduce the student in general concepts of optics and measures utilized to correct errors of refraction. The students will solve basic problems in optics and refraction and will participate in demonstration with optical equipment. It provides information about contact lens handling and the different contact lenses available at present.

TEOF 2008 - Ophthalmic Equipment. Two (2) credits.
This course will provide the student with knowledge and practice of the different instruments and equipment utilized in the ophthalmology service. Students will be able to describe the instruments and equipment and learn about their functions in conferences and laboratories. They will also learn about the care and maintenance of the instruments and equipment.

TEOF 2009 - Ophthalmic Pharmacology. Three (3) credits.
In this course, the student will learn about the effects, indications, uses and contraindications of the drugs most commonly used in ophthalmology. They will also learn about the functions of the autonomic nervous system through conferences and demonstrations. A goal is to provide an understanding of pharmacological action that may be related to ocular side effects from medications. The emphasis will be on those applicable pharmacokinetic and pharmacodynamics areas of drugs that have clinical relevance to the ophthalmic technician.

TEOF 2010 - Professional, Ethical and Psychology Aspects in Ophthalmology. Two (2) credit.
This course is designed to provide the student with a comprehensive knowledge of professional, ethics and psychology aspects in ophthalmology. The contents and experiences of the course will emphasize the professional and ethical conduct that the ophthalmic technician should observe in and out of his work. In the same way, provide general concepts in the psychology involved in dealing with patients. The student has the opportunity to study the laws governing the practice of ophthalmology in Puerto Rico, the importance of medical records and ophthalmic terminology.

TEOF 2015 - Diagnostic Techniques and Procedures. Three (3) credits.
In this course, the student will understand the variety of different diagnostic techniques used by the ophthalmologists. Through conferences and laboratories, they will learn the steps towards each of the basic diagnostic and recognize the importance and purpose of different diagnostic procedures

TEOF 2016 - Common Eye Diseases, Trauma, and Emergencies. Three (3) credits.
In this course, the student will learn to describe and discuss the clinical features, differential diagnoses, and management of the most common ocular medical conditions, traumas and emergencies. Also the student will learn to differentiate between a semi-urgent, urgent and ocular emergency and how each one is handled. The students will learn about the most common pathogens in ocular infection and antimicrobial therapy.

TEOF 2017 – Ocular Surgery and Aseptic Techniques. Three (3) credits.
This course will provide students with basic concepts regarding surgical assistance in minor and major ocular surgeries in operating rooms and the ophthalmic clinics. The course also covers the study of the surgical procedures according to each part of the eye. Students are expected to apply the basic principles of asepsis, sterile techniques, and universal precautions. Another objective of the course is for students to identify and manage the ocular surgical equipment and microsurgical instruments, as well as how to handle the patient in the pre-and post-operative period.

TEOF 2025 - Clinical Practice. Sixteen (16) credits.
This clinical experience course will provide students the opportunity to apply knowledge and skills learned in the theoretical courses prerequisites. Supervised experiences in ophthalmology settings; hospitals, private clinics, operating room, and non-traditional sceneries is provided. In these clinical settings, the student will perform and learn, under the supervision of the ophthalmologist or clinical supervisor a diversity of diagnostic procedures and to assist the ophthalmologist in minor and mayor ocular surgeries. In addition, the student will expose and will learn to use different programs of electronic medical records. Furthermore, the students will be exposed to work with peers, interdisciplinary professional groups, and diversity of patients.

TMED 4001 - Clinical Biochemistry I. Four (4) credits
Introduction to the biochemical analysis of blood and other body fluids. The theoretical content includes the following topics: hydrocarbons, enzymes, protein, iron, toxicology, therapeutic drug monitoring, laboratory calculations and others. Emphasis is placed on discussion of the principles and statistical procedures related to quality control, analytic procedures and clinical pathologic correlation, laboratory experiences including basic techniques and procedures necessary to obtain precise and exact test results.

TMED 4002 - Clinical Biochemistry II. Three (3) credits.
A general introduction and biochemical analysis of blood and other body fluids. The thematic content includes lipids; hormones; gastrointestinal and renal functions; acid-base, electrolyte and water balance. Emphasis is given to the principles of analytic procedures, statistics, quality control, as well as clinical and pathological correlations. Laboratory experiences with basic procedures and techniques needed to obtain precise and exact results.

TMED 4010 - Introduction to Clinical Laboratory Science. One (1) credit.
The introductory course initiates the students in the study of Medical Technology to develop an interest in converting him/her self into a competent health professional and in providing services to the community. Included is an orientation related to professional regulations and agencies concerned, legal-ethical aspects, use of basic equipment in the work area, security regulations, biostatistics in quality assurance, and employment opportunities.

TMED 4015 - Clinical Practice in Biochemistry. Three (3) credits. Pre-requisites: TMED 4001, TMED 4002.
In this course, clinical practice experience in clinical biochemistry area at an affiliated institution is provided. The students will practice in a laboratory setting with patient's samples, applying principles of clinical laboratory science to perform, analyze and report analytical procedures. Emphasis will be given to experience with modern automated instrumentation, working within a total quality assurance program and use of a laboratory information system.

TMED 4021 - Hematology I. Three (3) credits.
The course will focus on the basic concepts and laboratory techniques related to Clinical Hematology. include will be an in-depth discussion and evaluation of the parameters related to complete blood counts (CBC) including the differential blood smear and observation of normal erythrocyte, leukocyte and platelet morphology. Basic principles and techniques of coagulation and fibrinolysis are also discussed and performed.

TMED 4022 - Hematology II. Three (3) credits. Pre-requisites: TMED 4021.
The scope of this course is on the areas of pathophysiology classification of anemias and other erythrocyte disorders, and on the morphologic and pathophysiologic aspects of white blood cells as seen in leukemia, lymphomas and infections. Related diagnostic tests are discussed. Laboratory sessions provide students the opportunity to practice routine procedures in Hematology.

TMED 4035 - Clinical Practice in Hematology. Three (3) credits. Pre-requisites: TMED 4021, TMED 4022.
In this course, a clinical practice experience in Hematology area at an affiliated institution is provided. The students will practice in a laboratory setting with patient's samples, applying principles of clinical laboratory science to perform, analyze and report analytical procedures. Emphasis will be given to experience with modern automated instrumentation, working within a Total Quality Assurance Program and use of a Laboratory Information System.

TMED 4041 - Immunohematology I. Two (2) credits.
This course has been designed to prepare entry-level medical technologist who are responsible, knowledgeable and motivated for lifelong-learning in blood banking. The course will be offered through lectures, group discussions, case studies, and laboratory experiences. Students will develop basic knowledge on blood collection, processing, and storage; fundaments of Immunohematology, (in particular genetics); immunology and antiglobulin testing; and the major blood group systems. Particular emphasis will be placed on the development of students' skills for interpreting results, problem solving and decision-making. Laboratory sessions will provide students the opportunity to practice routine pretransfusion testing procedures. The urgency for recruiting adequate numbers of qualified donors in order to meet patients' transfusion needs will be stressed throughout this course.

TMED 4042 - Immunohematology II. Two (2) credits. Pre-requisite: TMED 4041.
Readings on pre-transfusion testing, clinical conditions associated with Immunohematology, possible complications of transfusion and the practical aspects of transfusion medicine are discussed. Students are introduced to the ethical and legal responsibilities of the blood bank technologist. Particular emphasis is placed on the development of students' skills for interpreting results, problem solving and decision-making. Laboratory sessions provide students the opportunity to practice routine pre-transfusion testing procedures.

TMED 4065 - Clinical Practice in Immunohematology. One (1) credit.
The students will practice in a laboratory setting with patient's samples applying principles of clinical laboratory science to perform, analyze and report analytical procedures. Emphasis will be given to experience with modern automated instrumentation, working within a Total Quality Assurance Program and use of a Laboratory Information System.

TMED 4075 - Clinical Serology-Immunology. Three (3) credits.
Basic mechanisms of immunity in health state and disease are discussed in this course. Deals with the principles involved in the different techniques used to identify the serologic markers needed for the diagnosis and monitoring of infections, immunoproliferative, autoimmune, hypersensibility conditions as well as pregnancy. Emphasizes in the pre-analytic, analytic and post-analytic aspects of the clinical analysis, analysis safety rules, assurance and quality control that leads to precision and accuracy in the Serology Laboratory.

Laboratory sessions provide students the opportunity to practice routine procedures in Serology-Immunology.

TMED 4085 - Clinical Practice in Serology. One (1) credit. Pre-requisites: TMED 4075.
In this course a clinical practice experience in clinical and serology area at an affiliated institution, is provided. The students will practice in a laboratory setting with patient's samples, applying principles of clinical laboratory science to perform, analyze and report analytical procedures. Emphasis will be given to experience with modern automated instrumentation, working within a Total Quality Assurance Program and use of a Laboratory Information System.

TMED 4095 - Urinalysis. Three (3) credits.
This course is designed to provide Medical Technology students the knowledge and competencies required to perform a complete urinalysis in the clinical laboratory. The course includes urinalysis aspects related to the physical, clinical and microscopic nature of urine testing. It also covers the clinical-pathologic correlation of test results.

TMED 4106 - Clinical Practice in Urinalysis/Parasitology. One (1) credit. Pre-requisites: TMED 4095, ZOME 6503.
In this course, clinical practice experience in Parasitology/Urinalysis area at an affiliated institution is provided. The students will practice in a laboratory setting with patient's samples applying principles of clinical laboratory science to perform, analyze and report analytical procedures. Emphasis will be given to experience working within a Total Quality Assurance Program and use of a Laboratory Information System.

TMED 4115 - Clinical Practice in Bacteriology. Three (3) credits. Pre-requisites: MICR 4006.
In this course clinical practice experience in the microbiology area at an affiliated institution, is provided. The student will practice in a laboratory setting with patient's samples, applying principles of clinical laboratory science to perform, analyze and report analytical procedures. Emphasis will be given to experience with modern automated instrumentation, working within a Total Quality Assurance Program and use of a Laboratory Information System.

TMED 4135 - Principles and Utilization of Instrumentation in Clinical Laboratory Analysis. Two (2) credits.
Laboratory automation has expended rapidly and understanding how an instrument operates represents a challenge for new professionals in the field. This course is designed to provide the student of Medical Technology with general abilities and knowledge needed to operate clinical laboratory equipment that is currently available in the marketplace. It includes general information about basic principles and theory of instrumental analysis as applied to the field of Laboratory Medicine.

TMED 4140 - Clinical Laboratory Administration. Three (3) credits.
In this course, fundamental principles of administration and supervision in the clinical laboratory are focused. Topics such as governmental laws and regulations, financial operations of laboratories, communication, professionalism, personnel and providers training will be discussed.

TMED 4150 - Modern Concepts in Clinical Laboratory Sciences. Three (3) credits.
Themes related to the major clinical areas of Laboratory Sciences will be discussed; modern concepts, new methodologies and instrumentation. Introduction to written and analytical skills used in professional journal writing.

ZOME 6503 - Medical Parasitology. Three (3) credits.
This course is designed for students of Medical Technology with a background in organismal biology, cell biology, ecology, and chemistry. This course will acquaint the student with the subjects of clinical

parasitology. Topics covered include parasite diversity, parasite/host relationships and their effects; descriptions of life cycles of parasites, parasite evasion, host pathology, microscopic examination and preservation of specimens are stressed. General classification and characteristics of pathogenic helminth and protozoa are presented. The theoretical and laboratory component of the course will study the parasites of medical and veterinary importance. The laboratory exercises will concentrate on the preparation of specimens, microscope use as well as identification of organisms encountered in parasitology studies.

GRADUATE COURSES

ADIS 6005 - Legal Aspects of Health Record Management. Four (4) credits.
This course shows the health and clinical record as a legal document. By studying different legal concepts, the students will develop knowledge of the legal aspects that apply to health record management, with emphasis on the rules that govern it, the use of health record as evidence in legal processes, and the legal aspects of the dissemination of information to prevent unauthorized access. Are studied, in general, diverse legal materials and the way they are supposed to be applied by the health information administrator (HIM). The course provides knowledge concerning the most important laws and regulations directly related to the field of health information management, and about common legal issues that can be found in the handling of health information management. Teaching strategies includes lectures, formative exercises in the classroom and discussion forums using blackboard platform.

ADIS 6106 - Principles of Health Information Management (HIM). Four (4) credits.
In this course, the following components of a Health Record System are studied: identification, filing, retention, and retrieval of information. Ancillary services are also studied as well as non-hospitals health institutions. Emphasis is place on the peculiarities of the services and on the Health Information Management System. Laboratory experience in the field and in the classroom is provided in order that the student may observe the theoretical concepts studied.

ADIS 6107 - Health Record in Healthcare Organizations. Three (3) credits.
The Health Record is studied as an essential and dynamic instrument of the Health Information System. The study of the Health Record includes: assessment of its development, content, and structure. Laboratory experience in the classroom and in the field is provided.

ADIS 6108 - Coding and Classification System of Diseases. Three (3) credits.
This course encompasses the study of the Diseases Classification Systems with emphasis in basic principles of coding. It includes the purposes for the classification of health information, the evolution of the nomenclatures of disease classification systems and the evolution and design of means for collecting health information. Laboratory experience in the classroom and in the field is provided.

ADIS 6111 - Analysis and Design of Health Information Systems. Two (2) credits.
This course provides the student with basic concepts of analysis and design of health information systems within healthcare organizations. Special emphasis is assigned to the information system development life cycle methodology, applying the phases of analysis and design from the specific components (micro level) through the whole system (macro level). Different methodologies, tools and technologies are applied to support these two phases of the information system development life cycle. In addition, this course provides the student with the basics concepts required to understand databases. The methodology of prototyping is used for the development of a health information system using a relational database management system model. The student concludes the course preparing the technical and user manuals related to the system prototype developed. This is a Web Enhanced course.

ADIS 6112 - Implementation and Evaluation of Health Information Systems. Two (2) credits.
This course provides the student with basic concepts of implementation and evaluation of health information systems within healthcare organizations. Special emphasis is assigned to the information system development life cycle methodology, applying the phases of implementation and evaluation from the specific components (micro level) through the whole system (macro level). The analysis and design concepts learned and applied in ADIS 6111 will be used together with the new implementation and evaluation concepts. In addition, special emphasis is assigned to the application of different methodologies, tools and technologies that support implementation and evaluation phases in the information system development life cycle. The course examines and evaluate the main components of an electronic health record (EHR) System and a Hospital Information System (HIS). The student concludes the course examining and evaluating an implemented HIS that include an EHR System in a healthcare organization. This is a Web Enhanced course.

ADIS 6115 - **Evaluation of Quality in Healthcare Organizations. Two (2) credits.**
This course emphasizes the study of different evaluation programs of health institution such as: Performance Improvement, Utilization and Risk Management, Care Environment, Medical Faculty, Committees and Credentials. Legal aspects of the assessment and application of appropriate statistical methods and tools for the collection, analysis, interpretation and presentation of results from evaluations of health care are also discussed. Application of knowledge acquired through the elaboration of a project assessing the quality of service, is required.

ADIS 6121 – Pre-internship in Health Information Management (HIM). Two (2) credits. Pre-requisites: Approved First Year courses.
The student receives supervised clinical experience. It includes five weeks immersed in the assigned institution. It takes place during the summer session of the first year. At the conclusion of the session, the student will have used 187 hours (37.5 hours per week) of supervised practice, demonstrating the skills and progress to the faculty.

ADIS 6122 - Internship in Health Information Management and Research Project. Five (5) credits.
Course culminates with the academic and professional training offered to future Health Information Administrator. It includes immersion in a Department of Health Information Management of a hospital or ancillary services recognized, under immediate supervision of a Health Information Administrator qualified and general supervision of the professor in charge of the course. Is required to submit a research project, which must be approved by the faculty of the program and present the results of the research project develop within work teams.

ADIS 6125 - Human Resources Management. Three (3) credits.
This course provides the student with basic concepts related to the management and supervision of human resources in the Health Information Management (HIM) department within a healthcare organization. The methodology of oral and written reports, problem solving and case discussions in HIM is used for the integration of knowledge, skills and attitudes related with the effective management of human resources in the HIM department. This is a Web Enhanced course.

ADIS 6127 - Seminar in Health Information Management. Two (2) credits.
Through case studies and administrative situations where the student attends the complex skills in problem solving and decision making in Health Information Management. Teaching is focused on developing thinking skills, exposing students to observed or detected by them in his Internship (Clinical Practice) in affiliated hospitals and medical institutions, or in cases brought by teachers to supplement the problems presented. Emphasis is given to cases concerning the management and process professional situations so that the student can solve problems and make decisions using the knowledge, skills and attitudes acquired in their courses.

ADIS 6135 - Finance in Health Information Management. Four and a half (4.5) credits.
This course provides the students with the concepts required to understand the finance and accounting and its challenges within the healthcare organizations. It offers students with an in-depth understanding of budget preparation, variance analysis, and capital investment issues concerning the financial health of healthcare organizations. Students are expected to apply concepts of finance and accounting through problem solving and case discussions related to healthcare organizations. This is a hybrid course.

ADIS 6136 - Security in Health Information Management. Four and a half (4.5) credits.
This course provides the student with concepts required to understand privacy and security rules, threat identification, risk analysis, disaster recovery, business continuity, and its challenges within the healthcare organizations. It offers students an in-depth understanding of risk analysis and contingency planning in accordance with the Health Insurance Portability and Accountability Act (HIPPA). Students are expected to apply the concepts of privacy and confidentiality, security, risk analysis and contingency planning through projects related to healthcare organizations. This is a hybrid course.

ADIS 6190 Strategic Management and Leadership
This course study of administrative functions and its application on Health Information Management. The course focus on strategic and organizational management, leadership, training and development, and ethics. Emphasis will be on staffing, directing, decision-making, development and evaluation of policies, and procedures for the establishment of standards for the improvement of health information services. The students will apply these concepts in the field and in the classroom through practice exercises and visit to health organizations.

ADIS 6191 Research Methods in Health Information Management
This course provides students with the basic the knowledge and skills related to the scientific method. It offers students in-depth understanding about ethical issues, problem statement, literature review, theory framework and research design. The course requires that student develop a supervised research protocol in health information management area.

ADIS 6220 Applied Descriptive and Inferential Statistics
This course includes concepts of descriptive and inferential statistics and their application to health information management. Topics such as: probability theory, inferential statistics, sampling and sample size, interval estimation, hypothesis testing, and analysis of variance, regression, and correlation analysis are addressed. At the end of the course, the student will be able to compute, analyze and interpret basic descriptive and inferential statistic. The student will apply the statistic knowledge in the conceptualization of the final research project. Computer software will be used for organizing and displaying data and statistical analysis.

ADIS 6221 Introduction to Pathophysiology and Pharmacology
This course will explore the fundaments of the historical evolution of medicine and medical terminology. In addition, it integrates anatomy and physiology concepts in the understanding of diseases. The course will include aspects of biology, immunology, pharmacology, microbiology, cancer, hereditary disorders, clinical laboratory test, and radiology test. The course will help the student to understand how the body responses to suffering from a number of possible abnormalities that lead to diseases, and the most common drugs used in their treatment. At the end of each unit, the student will evaluate clinical cases and exercises through the web enhance online course management system.

ADIS 6222 Applied Healthcare Statistics in Health Information
This course introduces the health information management student to the understanding of basic Healthcare Statistics, such as: patient census, percentage of occupancy, length stay, discharge days, death mortality rate,

morbidity and autopsy rate. The course will give the student the opportunity to apply basic statistic tools for analyzing data and for the elaboration of tables and graphics data reports for administrative, clinical and financial decision-making.

ADIS 6223 Clinical Foundation of Health Information Management
This course integrates anatomy and physiology concepts in the study of the nature and causes of disease. It also includes the study of etiology, physical signs and symptoms, prognosis, laboratory and specialized tests, complications, comorbidities, treatments, and ethical aspects of commonly occurring diseases. The students will apply these concepts with practical exercises through the web enhanced online course management system. During the course, the student will be able to validate diagnosis, treatment, management, and application of advanced medical terminology in clinical cases models and in healthcare records. At the end of the course, the student will develop protocols for validation of diagnosis and clinical management through the documentation of the healthcare record, with inpatient emphasis.

ADIS 6224 Principles of Healthcare Reimbursement
This course provides the knowledge and skills of healthcare reimbursement systems, reimbursement methodologies and payment process through the healthcare industry. The course focus on Inpatient Prospective Payment System, standardized coding system (needed for a stable and efficient payment process), and revenue cycle management (RCM), including ethical aspects of the profession and codification. The student will apply these concepts with practical exercises through the hybrid course management system.

ANAT 7425 - Human Anatomy. Four (4) credits.
Gross human regional anatomy with emphasis in musculoskeletal, nervous, respiratory, and cardiovascular systems. It also includes gastrointestinal and genitourinary structures, and basic concepts of histology and embryology. Relevant concepts of radiographic anatomy are discussed and illustrated through the examination of diagnostic images in the laboratory sessions. Students are expected to correlate structure and function as well as to initiate basic analysis of clinical correlation from an anatomical perspective. Supervised laboratory sessions include cadaver dissection, examination of prosected cadavers, and the use of anatomic software.

AUDI 6508 - Communicative Disorders of the Visually Impaired Individual. One (1) credit.
Study of language problems in blind, partially blind, and deaf-blind children. The communicative difficulties of visually impaired adult are also covered.

AUDI 7115 - Acoustics for Hearing and Speech Sciences Laboratory. One (1) credit. Co-requisites: AUDI 7116.
In this course, the student is provided with laboratory experiences and demonstrations that complement the theoretical topics discussed in the Acoustic for Hearing and Speech Sciences course. The laboratory experiences are geared toward developing in the student the basic skills to handle and operate the equipment used for the measurement of sinusoidal and complex sounds. Laboratory exercises will also allow the student to perform acoustic measurements of speech, and to experience and measure diverse psychoacoustics phenomena.

AUDI 7116 - Acoustics for Hearing and Speech Sciences. Three (3) credits. Co-requisites: AUDI 7115, HLAG 6303.
The fundamental focus and content of this introductory course is the concept of sound as a physical and perceptual phenomenon. The principal topics to be discussed are: behavior of the acoustic wave in the air, description of intensive aspects of sound and decibels (DB) scale; physiology of the peripheral auditory system, acoustics of speech production, psychoacoustics methods and characteristics of human hearing

including capacity to detect, discriminate and locate sound signals. Traditional learning strategies, as well as, distance learning strategies will be used in this course. Demonstrations and hands on experience will be provided in the acoustics for hearing and speech sciences laboratory course.

AUDI 7117 - Principles of Audiology Laboratory. One (1) credit. Co-requisites: AUDI 7118.
The Principles of Audiology Laboratory course provides basic training in the use of clinical audiology equipment. Laboratory sessions and assignments will provide hands-on experience with the equipment, as well as, with the clinical procedures discussed in the Principles of Audiology course. Laboratory experiences are designed to provide the student with the necessary background preparation for future experiences in clinical practicum.

AUDI 7118 - Principles of Audiology. Three (3) credits. Co-requisites: HLAG 6303, AUDI 7116.
This course will provide an overview of the discipline of Audiology designed to introduce students in the Audiology and Speech-Language Pathology programs to the areas of educational, rehabilitative, and diagnostic audiology. The course presents the theoretical and practical aspects of basic diagnostic audiological testing and how to relate these procedures to the structure and function of the auditory system. Basic audiologic procedures include pure tone audiometry, speech audiometry and middle ear measurements. Discussions of the relevance of each procedure in diagnostic disorders of the auditory mechanism will be conducted. Lectures, readings, group discussions, collaborative learning, and case studies are some of the instructional strategies that will be used in this course.

AUDI 7119 - Instrumentation in Audiology. Two (2) credits.
In the course the principles that govern instrumentation in Audiology, including the basic acoustical, psychoacoustical and electronic principles related to the development of audiological equipment used in the clinic and in research, will be discussed. The rationale behind the construction of clinical instrumentation, computer applications, auditory prosthesis and assistive technology will be presented. Current legislation and standards that apply to sound measuring and audiological instruments will be discussed. Aspects such as calibration, maintenance and adequate equipment will also be addressed.

AUDI 7120 - Speech Disorders. Three (3) credits. Pre-requisites: HLAG 6303, HLAG 6325, AUDI 7116.
This course will offer an overview of the pathology, identification, diagnosis and treatment of speech disorders. Students will develop the skills to identify articulation, fluency and voice disorders to make appropriate referrals. The course includes a discussion of speech disorders characteristics and clinical management with an emphasis on hearing impaired populations.

AUDI 7125 - Pharmacology in Audiology. Two (2) credits. Pre-requisites: AUDI 7118, HLAG 6303.
Discussion of pharmacology issues which are specific to the practice of Audiology. The student will identify the drugs that can cause a temporary or permanent damage to the auditory and/or balance systems. Likewise, the student will also become familiar with the most common drugs used for the treatment of pathologies of the auditory and vestibular systems.

AUDI 7126 - Advanced Audiology. Three (3) credits. Pre-requisites: AUDI 7118. Co-requisites: AUDI 7127.
In this course, the theoretical and clinical bases of the differential diagnosis of auditory disorders will be discussed. The main objective of the course is for students to learn the theoretical basis of masking, as well as, to master the masking decision process. The concept of test battery and crosscheck principles will be applied in clinical case studies. Control and prevention of disease transmission in the clinical scenario will be analyzed and cerumen management clinical protocols will be presented. Interview techniques, cultural diversity as it applies to patient management, clinical report writing, client record management and HIPPA regulations will also be addressed. Demonstrations and hands on experience will be provided in the Laboratory of Advance Audiology course.

AUDI 7127 - Laboratory of Advanced Audiology. One (1) credit. Pre-requisites: AUDI 7115, AUDI 7118. Co-requisites: AUDI 7126.
This laboratory complements the knowledge acquired in the Advanced Audiology course. Clinical protocols in universal precautions will be adapted for use in a clinical setting. Concepts in tests construction and administration, interpretation and adaptation of clinical protocols will be applied through laboratory exercises. The students will practice interview techniques for client history intake, advanced clinical differential diagnostic methodologies and strategies for the establishment of external middle ear function, hearing sensitivity levels and speech recognition ability. Students will develop basic skills in videootoscopy, cerumen management and tinnitus assessment. Laboratory exercises will include preparation of clinical records, clinical reports and progress notes documentation following HIPPA regulations. Grading System: Passed (P), Not Passed (NP)

AUDI 7128 - Physiological Assessment of the Auditory System. Three (3) credits. Pre-requisites: AUDI 7118, HLAG 6303. Co-requisites: AUDI 7126, AUDI 7129.
This course provides the student with a comprehensive study of the theoretical and applied physiological measures of the auditory system (e.g. electrocochleography, otoacoustics emissions, and auditory evoked potentials; including early, middle and late responses). The student will interpret the results of the physiological measurements and will use that interpretation to establish a diagnosis of the most common diseases and conditions of the auditory system. The course emphasizes student's participation through presentation of case studies and group discussions on the analysis and interpretation of test results. Demonstrations and hands on experiences will be provided in the Laboratory of Physiological Assessment of the Auditory System course.

AUDI 7129 - Laboratory of Physiological Assessment of the Auditory System. One (1) credit. Pre-requisites: AUDI 7118, HLAG 6303. Co-requisites: AUDI 7126, AUDI 7128.
This laboratory course compliments the Physiological Assessment of the Auditory System course. Through demonstrations and practice, the student will learn how to perform various physiological measurements of the auditory system, and how to interpret the findings of these measurements. Some of the measurements to be studied are: electrocochleography, otoacoustics emissions, and auditory evoked potentials; including early, middle and late responses.

AUDI 7201 - Clinical Practicum I. One (1) credit. Pre-requisites: AUDI 7126.
This is the first of the clinical practicum courses. The student interns will receive individualized instruction, under constant supervision of a licensed clinician. The focus of this practicum experience will be to have the student observe clinical procedures and perform basic audiologic procedures of the basic battery with the preceptor's assistance. A minimum of 50 patient contact hours are required in order to complete the course.

AUDI 7202 - Clinical Practicum II. Two (2) credits. Pre-requisites: AUDI 7201.
This is a second course in a sequence of six clinical practicum courses. The objective of the series of courses is to prepare the intern to become an autonomous professional in the field of Audiology. The interns will receive individualized instruction under direct supervision. The focus of this practicum experience will be to have the intern perform basic audiologic assessment procedures in consultation with the clinical preceptor. The intern will also be initiated in physiological procedures, special tests performance, hearing aid prescription and management. A minimum of 100 clinical contact hours are required to complete the course.

AUDI 7203 - Clinical Practicum III. Three (3) credits. Pre-requisites: AUDIO 7202.
This is the third course in a sequence of six clinical practicum courses that prepares the intern to become an autonomous professional in the field of Audiology. The focus of this practicum experience is to have the intern conduct basic audiologic assessment independently, and advanced hearing, and balance procedures under direct supervision of the clinical preceptor. The intern will also be performing hearing aid prescriptions,

audiologic rehabilitation and counseling under direct supervision of the preceptor. A minimum of 150 clinical practice hours are required to complete the course.

AUDI 7204 - Clinical Practicum IV. Three (3) credits. Pre-requisites: AUDI 7203.
This is the fourth course in a sequence of six clinical practicum courses that prepares the interns to become autonomous professionals in the field of Audiology. The focus of this practicum experience will be to have them perform basic audiologic assessment independently and advanced hearing and balance procedures with the clinical preceptor. The interns will also be conducting hearing aid prescription, audiologic rehabilitation and audiologic counseling with minimal supervision of the preceptor. The interns will also develop and conduct a community project. A minimum of 150 clinical hours are required to complete the course.

AUDI 7211 - Amplification Systems I. Three (3) credits. Pre-requisites: AUDI 7116, AUDI 7119, AUDI 7126. Co-requisites: AUDI 7213.
This course is the first of a two-course sequence in hearing amplification. Its purpose is to introduce the student to the physiology of hearing loss and to the process of fitting hearing aids. Some topics include, the importance in the process of making earmold impressions, earmold and earshell acoustics, types of hearing aids, the components of hearing aids, electroacoustic measurement of hearing aid performance, assessing patient needs and determining hearing aid candidacy, using prescriptive fitting strategies, and basic hearing aid repair and troubleshooting. Lectures, group discussions, collaborative learning, case studies, and distance learning strategies are some of the instructional strategies that will be used in this course.

AUDI 7212 - Amplification Systems II. Three (3) credits. Pre-requisites: AUDI 7211. Co-requisites: AUDI 7214.
This course is the second of a two-course sequence in amplification systems. The purpose of this course is to expand the acquired knowledge on the first course: Amplification Systems I, on current amplification concepts, principles, and rationales. Topics to be studied include: advanced hearing aid fitting methods, hearing aid compression systems, digital and programmable hearing aid circuitry, and digital and programmable hearing aid fitting. Assistive listening and other sensory devices in addition to implantable technologies will also be studied.

AUDI 7213 - Amplification Systems I Laboratory. One (1) credit. Pre-requisites: AUDI 7116, AUDI 7119, AUDI 7126. Co-requisites: AUDI 7211.
The laboratory experiences in this course are geared toward developing in the student the basic skills in the art of earmold impressions; physical and, acoustic, modifications of earmolds and basic hearing aid components. The laboratory will provide the student the opportunity of performing evaluation procedures for selection of hearing aids. Laboratory sessions and assignments will provide hands-on experience with the equipment, as well as, with the clinical procedures discussed in the Amplification Systems I course.

AUDI 7214 - Amplification Systems Laboratory II. One (1) credit. Pre-requisites: AUDI 7211, AUDI 7213, Co-requisites: AUDI 7212.
In this laboratory, the students will apply the knowledge acquired in the Amplification Systems II course. Laboratory experiences include selection, programming, and fitting of amplification systems, including assistive listening devices.

AUDI 7216 - Differential Diagnosis in Pediatric Audiology. Three (3) credits.
This course will focus on the audiological diagnosis and management of the pediatric patient from birth to adolescence. Physiological, as well as, the anatomical development of the hearing system from its embryology to its maturation will be discussed. The more prevalent hearing pathologies and syndromes in the pediatric population will be presented. The different stages of auditory behavior from reflexive responses

to deliberate sound tracking will be depicted. Age appropriateness and adequacy of physiologic and behavioral assessment strategies, as well as, test interpretation will be addressed.

AUDI 7217 - Psychosocial Aspects of Hearing Loss. Two (2) credits.
A study of the psychological, emotional and social impact of hearing loss on individuals and their families throughout the life span. Hearing impaired individuals' participation in educational, occupational and recreational scenarios will be analyzed. Students will apply basic counseling skills for the audiologic rehabilitation of individuals with hearing loss and their families. Psychosocial issues of the deaf community and its' culture will be explored.

AUDI 7218 - Auditory Pathologies. Three (3) credits. Pre-requisites: HLAG 6303, AUDI 7126.
This course provides the student with a comprehensive study of the etiology, symptoms, treatment and rehabilitation principles in ear disorders, including audiological interpretations, and medical implications of an auditory pathology. The student will learn to relate the audiometric findings and symptoms to the most prevalent ear diseases. Lectures, student's presentations, literature searches and group discussions of case studies are some of the instructional strategies that will be used in this course.

AUDI 7221 - Research Project I. Two (2) credits. Pre-requisites: HLAG 7112.
This course is the first of a three-course sequence in which the student will develop a research project. The student will identify a research question, perform literature review and write the introduction and method section of the research project under faculty supervision.

AUDI 7222 - Research Project II. Two (2) credits. Pre-requisites: AUDI 7221
This is the second of a three-course sequence in which the student will develop a research project. The student, under the guidance of a faculty mentor, will begin the data collection phase for their research project. Weekly progress meetings are required as agreed by mentor and student.

AUDI 7223 - Research Project III. Two (2) credits. Pre-requisites: AUDI 7222.
This course is the third of a three-course sequence in which the student will develop a research project. In this course, the student under the guidance of a faculty mentor will complete the data collection phase that was initiated during the Research Project II course. In addition, the student will analyze the data and finish writing the research manuscript. Weekly meetings between the mentor and the student in order to monitor progress are required. The student will present the final project in a peer-reviewed publication format, as well as, in an oral presentation to the academic community.

AUDI 7226 - Research Application in the Clinical Practice of Audiology. Two (2) credits. Pre-requisites: HLAG 7112.
In this course, the student will develop skills to make clinical intervention decisions guided by research-derived evidence. The student will become proficient in literature search, critical appraisal of scientific literature, analysis of scientific findings and outcome measurements in order to identify the best evidence to support decisions taken on specific audiological clinical cases. The role of the professor a facilitator is to promote self-learning. Ethical and legal issues about research will be discussed in this course. Lectures, group discussions, collaborative learning, and case studies are the main instructional strategies used in this course. Distance learning education platform will be used for some lectures.

AUDI 7227 - Occupational and Environmental Hearing Conservation. Two (2) credits. Pre-requisites: AUDI 7116, AUDI 7119, AUDI 7126. Co-requisites: AUDI 7228
The focus of this course is the study of the effects of noise in the human being, in society and in the quality of life. Anatomical, physiological and psychological effects of noise will be discussed. The course will present industrial and community sound control regulations, as well as, the review of established programs for the

conservation of normal hearing and the prevention of hearing loss in different acoustic environments. Sound measurement methods, including the instrumentation used, will also be discussed. Lectures, group discussions, collaborative learning, case studies are some of the instructional strategies that will be used in this course. Some lectures will be aimed by distance learning modality.

AUDI 7228 - Occupational and Environmental Hearing Conservation Laboratory. One (1) credits. Pre-requisites: AUDI 7116, AUDI 7119, AUDI 7126. Co-requisites: AUDI 7227.
This is the laboratory of the Occupational and Environmental Hearing Conservation course, which will provide the student with the opportunity to perform sound measurement in the field with the use of sound level meters and dosimeters. The student will also be required to develop a hearing conservation program that will emphasize hearing evaluation, hearing protection options and their fitting. Laboratory sessions and assignments will provide hands-on experience with the equipment, as well as, with the clinical procedures discussed in the Occupational and Environmental Hearing Conservation course.

AUDI 7231 - Assessment and Intervention of Balance Disorders I. Two (2) credits. Pre-requisite: AUDI 7126.
This course will focus on the audiologist role in the basic provision of assessment and diagnostic services of balance disorders. A description of the distribution of balance disorders among the general population will be provided. The anatomy and physiology of the balance system will be described, as well as, the more common pathologies associated to this system. Most frequently used assessment strategies such as extensive case history, subjective tests and nystagmography will be discussed.

AUDI 7232 - Assessment and Intervention of Balance Disorders II. Two (2) credits. Pre-requisites: AUDI 7231. Co-requisites: AUDI 7317.
This course is the second part of a two-sequence course in balance disorders. In this course, the student will focus on the role of the audiologist in the provision of advanced balance diagnostic services. Treatment for balance disorders will also be included in this course. Advanced balance assessment tests such as vestibulo-ocular reflex, vestibular evoked myogenic potential, rotary chair, and posturography will be discussed, among others.

AUDI 7305 - Audiologic Habilitation of the Pediatric Population. Three (3) credits. Pre-requisites: AUDI 7216, HLAG 6533
In this course the different techniques used to habilitate the pediatric hearing-impaired population will be discussed. The historical development of oral and manual philosophies will be presented and the student will be exposed to the educational models used to teach the deaf child, as well as, with partial hearing loss. Implications of acoustic phonetics in amplification and intervention plan development will be discussed. The assistive technology used to support academic and social activities will be presented and psychosocial aspects of hearing loss associated to counseling of family and teachers will be addressed.

AUDI 7315 - Auditory Processing Disorders. Two (2) credits. Pre-requisites: AUDI 7128
This course will focus on the neurological bases of normal and abnormal auditory processing. Diagnostic and intervention approaches to manage auditory processing will be discussed. Behavior and physiological assessment tools used with patients with auditory processing will be presented. Students will justify assessment and intervention decisions using case studies.

AUDI 7317 - Assessment and Intervention of Balance Disorders II Laboratory. One (1) credit. Pre-requisites: AUDI 7231 (Old Codification AUDI 7205), Co-requisites: AUDI 7232
In this laboratory, the students will apply the knowledge acquired in the Assessment and Intervention of Balance Disorders II course. Laboratory experiences will include the administration of balance tests such as the ocular, positional, positioning, caloric, and vestibular-evoked myogenic potential (VEMP) test batteries,

among others. In addition, the students will practice treatments such as that for benign paroxysmal positioning vertigo.

AUDI 7318 - Deaf Culture, Linguistics and Manual Communication Code Systems. Three (3) credits. Pre-requisites: HLAG 6300
Through this course, students will acquire the basic concepts for the development of expressive and receptive dexterities of communication through visual, gesture and manual modalities. The historic aspects of the development of the Puerto Rican sign language will be discussed. The concepts of culture and community, applied to the deaf population, as fundamental aspects of the socio-linguistics of deafness, will be studied. Instructional strategies will include, lectures, readings, group discussions, role playing, and invited deaf guests that will provide the students opportunities to become familiarized with the deaf culture, as well as provide practice sign language sessions.

AUDI 7319 - Audiologic Rehabilitation of the Adult. Three (3) credits. Pre-requisites: AUDI 7126, AUDI 7212, AUDI 7217
In this course, methods and treatment techniques for the audiologic rehabilitation of hearing-impaired adults will be studied. Assessment protocols for determining audiologic rehabilitation needs in adults will be compared. Audiologic rehabilitation intervention areas will include: counseling, amplification, acclimatization to amplification, self-evaluation outcome measures, communication strategies, tinnitus management, self-help groups and auditory/visual communication training. Students will develop treatment plans for adult audiologic rehabilitation. Outcome measures for treatment efficacy and efficiency will be addressed.

AUDI 7325 - Professional Issues in Audiology. Three (3) credits. Pre-requisites: AUDI 7305, AUDI 7319
This course presents an overview of the social, political and economic climate in hearing health care delivery. Pertinent historical and legal events in the professional field of Audiology will be discussed. The students will also examine professional issues including: ethical practice, legislation, professional credentialing, health care delivery systems, modes of audiological service delivery, professional autonomy, inter-professional relationships, advocacy and health disparities. Professional stress and burnout on the audiologist as a health service provider will be addressed. Mock trials will be role played where students will resolve cases applying codes of ethics and relevant legislation.

AUDI 7326 - Management Applications in Audiology Practice. Three (3) credits. Pre-requisites: AUDI 7126
In this course, the student will analyze the issues inherent to the establishment of a practice in Audiology. Emphasis will be given to private practice. Regulatory national and state agencies, patient/consumer rights, worker compensation, reimbursement, malpractice and supervision of other personnel will be discussed. Budget planning, as well as possible sources of funding available for equipment acquisition will be discussed. Field visits to audiological settings will be performed. Resources and programs available for health professionals initiating the development of a practice in Puerto Rico will be presented.

AUDI 7327 - Special Topics in Audiology. Three (3) credits. Pre-requisites: AUDI 7128, AUDI 7226, AUDI 7232, AUDI 7212
In this course the student will do an in-depth literature review of current areas of research in the field of Audiology. The topics to be discussed will be determined by the professor in collaboration with the students and announced at the beginning of the course. The student will be responsible for reviewing the literature and for preparing a manuscript and an oral presentation on the assigned topics.

AUDI 7405 - Clinical Practicum V. Fifteen (15) credits. Pre-requisites: AUDI 7204
This is the fifth course in a sequence of six clinical practicum courses that prepares the intern to become an autonomous professional in the field of Audiology. In this practicum, experience interns will be placed in an externship under a preceptor's supervision. The objective is to refine and increase their level of competence

and independence in the assessment of the auditory and balance systems, audiologic rehabilitation, hearing aid/assistive technology prescription, evaluation, and counseling. The focus of this course is to have the intern develop a comprehensive management for a variety of patients throughout the life span. A minimum of 750 clinical practice hours are required to complete the course.

AUDI 7406 - Clinical Practicum VI. Fourteen (14) credits. Pre-requisites: AUDI 7405
This is the last course in a sequence of six clinical practicum courses directed to senior audiology interns. Interns will be placed in externships where they are expected to perform as entry-level audiologists with minimal preceptor supervision. During this final phase of clinical practicum, the interns will deliver assessment, diagnostic and intervention services in the areas of hearing and balance. The intern will refine, integrate and enhance knowledge, skills and attitudes necessary to perform autonomous comprehensive hearing and balance patient care. A minimum of 700 clinical practice hours are required.

AUDI 7500 - Clinical Seminar. One (1) credit.
Students will participate in weekly presentations and class discussions of clinical case studies encountered in their clinical practicum courses. Students will conduct literature reviews on an assigned current professional topic. Topics will be selected by the program faculty based on professional trends. Guest lectures will be invited to address these topics in class sessions. Students will take this course on three academic sessions throughout the curriculum. Grading System: Passed (P), No Passed (NP) since November 2009.

CILC 6008 - Advanced Clinical Hematology. Two (2) credits.
This online course provides medical technologists an in-depth study of the advanced concepts in clinical hematology. Emphasis will be given to the normal and abnormal bone marrow and peripheral blood smear as well as the genetic, molecular and cellular mechanisms underlying the pathophysiology of nonmalignant and malignant hematologic disorders. Basic and advanced principles in hemostasis and thrombosis, cytogenetic methodologies and fundamentals of molecular hematological analysis will also be covered. The main Instructional strategies include: lectures, group discussions, videoconference, study cases discussion and independent studies, among others.

CILC 6015 - Advanced Clinical Immunology Studies I. Two (2) credits.
This course is designed to provide graduate students in clinical laboratory science with knowledge of the immune responses against viral infections, the mechanisms of viral induced immunopathology, and the diagnosis of several viral infections**.** Lectures will be offered on these principles followed by an independent study period where students analyze journal articles related to the previous lecture. The presentation is focused on recent literature related to pathogenic mechanisms, and diagnosis of specific viral infections. This course will be offered in hybrid teaching modality.

CILC 6016 - Advanced Clinical Immunology Studies II. Two (2) credits. Pre-requisite: CILC 6015.
This online course will expose the clinical laboratory sciences students to a general introduction to the cancer biology, the characteristics of the cancer cells and their tumor products. The thematic content includes the following topics: origin, biochemistry, laboratory identification and quantification, and the clinical application of blood soluble and tissue tumor markers. A general overview of the value of tumor markers as clinical tools, its specificity and tumor sensitivity, frequency in the determination and cost effectiveness will also be discussed in this course. The topics will be presented through the following instructional strategies: lectures, study case analyses, group discussion and independent study, among others.

CILC 6019 - Clinical Laboratory Statistics. Two (2) credits.
This course offered under on-line modality is designed to provide the graduate student of Clinical Laboratory Sciences with the knowledge, skills, and required attitudes for the application of statistical methods and procedures in the performance of the profession. This will lay a foundation in the description, analysis, and

comparison of situation in the Clinical Laboratory daily work. These competences are essential to develop a professional capable of judging the validity and reliability of data and techniques, which support the research in their area of expertise. The thematic content includes: basic principles of statistical analysis, gathering, classification and report of data and sampling methodology. Emphasis is given to descriptive analysis of qualitative and quantitative variables, principles of probability, test of inferential analysis such as: regression and correlation; besides the non-parametrical statistics. The course will be offered by combined methodology of conference sessions, group discussions, problem solving exercises, case studies and analysis of research papers. The course will be offered through videoconferencing sessions, synchronous and asynchronous group discussions, problem solving, online presentations, analysis of research articles and independent study among others

CILC 6020 - Clinical Laboratory Management. Two (2) credits.
This course is designed to provide medical technologists with an overview of their role as effective and efficient laboratory managers. Emphasis is given to the administrative functions, basic skills for supervision and personnel administration. Students acquire the necessary knowledge to handle basic laboratory finances such as budget preparation, wage and salary administration and cost accounting among others. The principles of total quality management are discussed. The course enables the students to perform critical analysis of journal articles, oral presentations, case studies and group discussions.

CILC 6026 - Special Topics in Clinical Laboratory Administration. Two (2) credits. Pre-requisite: CILC 6020.
This course is designed to provide in depth coverage of special topics in administration, which had been discuss previously in other courses of the program. It also includes, relevant and current aspects of administration of clinical laboratories. The topics discussed are established by the faculty and others are suggested by the students considering their needs and experience. Due to the variability in content, this course could include any of the following instructional strategies: conferences, workshops, seminars, independent studies, and oral and written presentations.

CILC 6035 - Quality Assurance I. Two (2) credits.
This course provides the graduate student of Clinical Laboratory Science with necessary knowledge for the application of quality management in the analytical process. Emphasis is given to the planning of a quality program, application and interpretation of statistics for the identification of variables that interfere with the quality of the result as required by the accrediting agencies. It considers the importance of quality in the pre-analytical, analytical, and post-analytical processes; also enables the graduate student to apply the quality monitoring and corrective measures to guarantee the excellence in the procedures. The topics are presented using the following educational strategies; lectures, discussions, oral presentations.

CILC 6036 - Quality Assurance II. Two (2) credit. Pre-requisite: CILC 6035.
This course provides the graduate students the knowledge required to perform a quality assurance program in the Clinical Laboratory in order to offer optimal services to the client. Tools needed to evaluate all the process involved in a clinical analysis, which includes specimen collection, handling and analysis of the sample, and the communication between laboratory personnel, the patient and the doctor are discussed. It emphasizes in the actions and steps to follow when a situation that affect a test result is detected. The topics are presented through the following instructional strategies: lectures, discussions, presentations, and case studies. Course changed from 1 to 2 credits since January 2010.

CILC 6040 - Practice in Administration and Quality Assurance. Three (3) credits. Pre-requisites: CILC 6020, CILC 6035, CILC 6036.
This course offers the student the opportunity to apply the knowledge and skills acquired through the administration and quality assurance courses. Will perform an administrative evaluation of the areas in which the laboratory needs to improve. Of those deficient areas, the student will choose one of them to develop

an action plan of corrective measurements and these will be implemented in coordination with the Laboratory Director. The instructional strategies used are practice, seminars, discussion, and oral presentations.

CILC 6046 - Genetics and Molecular Biology. Two (2) credits.
The course is divided in two major areas. The first area in this course is molecular biology focused in the basic structure, properties and functions of nucleic acids and proteins. Topics discussed are DNA and RNA structure, replication, repair and recombination, DNA transcription, and RNA processing and translation. The second area is a survey of genetics. Within this area, the following topics are presented: genetic terminology, patterns of inheritance and its variations in family and population level, genetic pedigree and its importance, and chromosome abnormalities and their relationship with disease. The clinical aspects of genetics, syndromes and prenatal diagnosis are presented. Topics will be presented through lectures, literature discussion and students' presentations.

CILC 6055 - Fundamentals of Research Proposal Design. Two (2) credits.
This course is designed to develop basic research skills in the Clinical Laboratory Science student in order to complete a feasible proposal for a research project in their major area of interest. Basic tools for scientific writing and presentations are also included. The instructional strategies will include: lectures, seminars, class discussions, literature review, written and oral presentation of the proposal, among others.

CILC 6205 - Laboratory Information Systems and Informatics. Two (2) credits.
This course is designed to provide students with a theoretical and practical knowledge of informatics in the laboratory. The course focuses in three areas; applications of informatics, databases and appropriate use of technology. The knowledge and skills acquired during this course will allow the laboratory professionals to maximize production, research and management in the laboratory. Laboratory sessions are included to complement the theory learned during the lectures.

CILC 6301 - Molecular Diagnostics I. Two (2) credits. Pre-requisites: CILC 6046.
Through distance learning modality this course presents the basic principles of molecular diagnostics used in clinical and research laboratories. The student is exposed to advances in molecular diagnostics in industry and in research procedures. Topics to be discussed are: purification and quantification of DNA and RNA, gel electrophoresis, visible spectrophotometry of nucleic acids, restriction enzyme analysis of DNA, DNA amplification and optimization of Polymerase Chain Reaction (PCR) and real time PCR. The course will also present the topics of microarrays, quality control, assurance, and assay validations for molecular diagnostics and General Laboratory Practices (GLP´s) for the molecular diagnostics. Applications of these techniques in the molecular diagnosis of prevalent diseases will be discussed. Topics will be presented through: Videoconferences, synchronous and asynchronous group discussions, video animations, discussion forums, interpretation of scientific papers and presentations, among others.

CILC 6302 - Molecular Diagnostics II. Two (2) credits. Pre-requisites: CILC 6301.
This online course includes the theoretical aspects of peptide synthesis and purification, quality control and industrial and research applications. Dry-laboratory experiences include the purification of proteins, HPLC chromatography, gas and ion exchange chromatography, and spectrometry. The course will also present the clinical applications of proteomics. The nature of protein biomarkers and the techniques for their discovery will also be discussed. Topics will be presented through a virtual learning environment. Instructional strategies include video stream lectures, open discussions, group discussions, videoconferences, dry-laboratory experiences, demonstrations, video animations, and independent studies, among others.

CILC 6305 - Clinical Laboratory Science Research. Three (3) credits. Pre-requisite: CILC 6055.
This course is designed so that the Clinical Laboratory Sciences student can apply basic research skills in order to perform and complete their approved research proposal. The student will be able to apply and integrate the scientific skills required for the execution of his/her research project as well as the writing skills required for manuscript preparation and submission for publication.

CILC 6306 - Pharmacogenomics: The Scientific Principles of Personalized Medicine. Two (2) credits. Pre-requisites: CILC 6019, CILC 6301.
This online course is divided in two major areas. The first area covers principles of pharmacogenetics and physiogenomics, including a review of existing molecular and statistical technologies. Topics discussed include pharmacokinetics and dynamics, technologies for biomarker discovery, and bioinformatics aspects of diagnostic systems. The second area concerns clinical applications across the real of medicine. Topics include case studies of the practice of individualized healthcare in infectious disease, oncology, endocrinology and metabolism, psychiatry and cardiology. Core areas of discussion include systems for discovery and clinical applications of biomarkers and the predictive value of these systems in clinical medicine. In addition, the regulatory and ethical milieu of personalized medicine is discussed with case studies on various pharmaceutical and diagnostic products.

CILC 6400 - Seminar. Two (2) credits
This course provides for knowledge construction through the interaction among students, professors and researchers on critical discussion of relevant topics and new tendencies presented in recent literature and scientific research in topics related to molecular diagnostics and laboratory management, among others. Students will prepare written questions about methodology, interpretation of findings, and other relevant aspects regarding the research papers and topics presented in order to foster analysis and critical discussion. Students will also choose a topic in order to prepare a literature review and an oral presentation. The course includes guest speakers whom will present state of the art techniques and research topics, and via students' presentations of articles previously approved by the professor. Grading System: Passed (P), Not Passed (NP).

CISO 6600 - Research Methods. Four (4) credits.
Basic principles about the selection, planning, and performance of research projects. Emphasis is given to the survey methodology; the basic principles of the design of forms and questionnaires is discussed, interviewing and processing statistical data is discussed. The students meet four hours a week.

CITO 6505 - Introduction to Cytotechnology. One (1) credit.
This is an introductory course, which presents the history and evolution of the Cytotechnology field. We emphasize the importance of the cytotechnologist function as a professional member of the health care team and the purposes of Cytotechnology will be emphasized. Professional aspects such as: the code of ethics and competencies will be discussed allowing students to initiate a professional behavior. The course includes technical aspects such as: the use of equipment and processing of cytological samples, laboratory safety procedures and laboratory handling. The instructional strategies include, among others: lecture, discussion, and independent study and laboratory demonstrations.

CITO 6507 - General Concepts in Basic Sciences. Two (2) credits.
This course will review general topics in basic sciences. Students will begin the course by examining basic components of the cell and cellular functions. This will be followed by discussion of cellular activity and immunologic responses. Students will be able to understand the different pathological processes that affect the cell, and the mechanism of cell response to injury. They will be trained in the evaluation of cellular samples. The instructional strategies include, among others: lecture, discussion, and independent study and laboratory demonstrations.

CITO 6509 - Female Genital System. Twelve (12) credits.
This course provides students the opportunity to participate in a series of educational activities that will develop knowledge and skills in anatomy, histology and cytology of the female genital system. They will distinguish between benign pathologic processes and neoplastic processes. The instructional strategies include, among others: lecture, discussion, independent study and laboratory practice.

CITO 6515 - Respiratory and Gastrointestinal System. Six (6) credits.
This course offers the students the opportunity of acquiring basic knowledge of the respiratory and gastrointestinal systems, by studying their anatomy, histology and cytology. It provides students the opportunity to participate in a series of educational experiences that will enable them to develop specific skills necessary prior to professional training. The study of respiratory system includes cytology of epithelial cells, non-epithelial cells, and non-cellular material. The study of the gastrointestinal system explores all of its organs. The students will be trained in specimen preparation procedures and in the implementation of new techniques in the field of Cytotechnology. The instructional strategies include, among others: lecture, discussion, independent study and laboratory practice.

CITO 6516 - Urinary System and Body Fluids. Two (2) credits.
At the end of this course, the students will have a broader concept of the female and male urinary systems and body cavity fluids. They will develop laboratory skills related to cytology of the urinary system and will examine its anatomy, histology, and cytology. Normal cytology, as well as benign and neoplastic conditions will be discussed. The anatomy, histology, and cytology of body cavities, as well as, the body fluids under benign processes and pathological conditions will also be studied. The instructional strategies include, among others: lecture, discussion, independent study and laboratory practice.

CITO 6517 - Mammary Glands and Miscellaneous. Two (2) credits.
This course will provide students the opportunity to broaden the concept of the breast and other parts of the human body. Students will study the anatomy, histology, cytology and hormonal effects of the breast, including normal cytology, non-neoplastic and neoplastic conditions. The course covers the study of anatomy, histology and cytology of other body components not included in previous courses, such as, blood flow, the cerebrospinal system, synovial fluids, eyes and skin. It concludes with the fine needle aspiration method as a diagnostic process. Laboratory practice provided during the course using clinical history, sampling and processing techniques for the study of cancerous cells. The instructional strategies include, among others: lecture, discussion, independent study and laboratory practice.

CITO 6518 - Clinical Practicum. Thirteen (13) credits. Pre-requisites: CITO 6505, CITO 6507, CITO 6509, CITO 6515, CITO 6516, CITO 6517.
This course will provide clinical experiences designed to enable students in the processing, evaluation and interpretation of cytological specimens, and in the management of laboratory activities as similar as possible to the ones that they will encounter as health professionals. Students will demonstrate ability to review and evaluate histologic tissue sections, Cytology and pertinent clinical data in order to establish correlation for the purpose of quality control and quality assurance. They will comply with laboratory safety measures and regulations. Throughout the clinical experiences, the students will be able to assist the clinician, in the FNA procedures and in the evaluation of the samples. At the end of the clinical practicum, the student is required to present a final research project.

HLAG 6300 - Basic Concepts in Linguistics, Psycholinguistics, and Psychoacoustics. Three (3) credits.
Topics in basic Spanish grammar, semantics, morphosyntax, phonology and pragmatics. Discussion on language used and auditory perception. Phonetic transcription in English and Spanish.

HLAG 6302 - Speech, Language, and Hearing Disorders. Three (3) credits.
Identification, definitions, classifications, and descriptions of Communicative Disorders. Study of etiology and incidence. Information on basic terminology of the profession, and its status in Puerto Rico and the United States.

HLAG 6317 - Clinical Practicum Seminar. One (1) credit.
Weekly meeting for the discussion of clinical cases and/or topics related to the profession.

HLAG 6533 - Language Disorders of Children. Three (3) credits.
Study of theories and recent findings of investigation about etiology, symptoms, diagnosis, and treatment of children with language disorders.

HLAG 6700 - Current Topics. One (1) credit.
Discussion of topics of current interest. Topics are established by periods according to new developments.

HLAG 6703 - Current Topics. Four (4) credits.
Discussion of topics of current interest. Topics are established by periods according to new developments.

HLAG 7111 - Research Methods in Communication Sciences and Disorders I. Two (2) credits.
This course is the first of a two-course sequence. The emphasis of these courses is to develop in the student the necessary skills to use different research methods and procedures, as well as, being able to critically analyze selected research documents. In this first course the student is exposed to several aspects of research activity in communication sciences and disorders, including the need for scientific research, the nature of scientific research, the different types of research, the several research designs, and the ethical guidelines and issues in research.

HLAG 7112 - Research Methods in Communication Sciences and Disorders II. Two (2) credits. Pre-requisites: HLAG 7111
This course is the second of a two-course sequence. The emphasis of these courses is to develop in the student the necessary skills to use different research methods and procedures, as well as, being able to critical analyze selected research documents. In this second course, the student is exposed to several aspects of research activity in communication sciences and disorders, including statistical and computer procedures for analyzing data, considerations in interpreting research results, and report writing. Multicultural and multilingual issues in the field of research are also discussed. As a requirement for this course the student will write a research proposal in groups of (2) students.

INVE 6011 - Research I. Two (2) credits.
This course is an introduction to the research process. Includes the philosophical and theoretical assumptions underlying empirical science as well as those directly related to measurement theory and designs based on the experimental paradigm. Emphasis is given on practical implications as they apply to professional practice, critical review of literature, and to basic principles of Descriptive and Inferential Statistics. The student is expected to develop skills in search, evaluation, and selection of useful and reliable information sources.

INVE 6012 - Research II. Two (2) credits. Pre-requisite: INVE 6011
This is an introductory course to qualitative research. The course includes the philosophical and theoretical assumptions of post-empiricist epistemology, as well as their practical applications to professional practice and to critical review of literature. The student is expected to further develop skills in search, evaluation, and selection of useful and reliable information sources already introduced in INVE 6011 - Research I. A potential researchable problem following a specific area of interest in Physical Therapy is expected to be proposed and framed within the continuum of experimental-qualitative research designs.

MEDU 6500 - Core Course in Public Health. Six to eight (6-8) credits.
All candidates for a Master's Degree in the School of Public Health are required to take this core course. It provides a core content in Demography, Biostatistics, Epidemiology, Social Sciences, Nutrition, Public Health, and Health Education as applied to health and disease. The course is presented in four substages: Man Interactive with his Environment, Instruments of Measure and Diagnosis, Health Problems, and Strategies and Techniques of Intervention. The course has four objectives: Perceive the Human Being as a Bio-psycho-social Individual. Recognize the Mayor Epidemiological Concepts and Methods used to Diagnose Health Problems, Identify Services Related to Epidemiological Vigilance and Health Education, and the Identification of Basic Biostatistics Methods as they related to the Health Fields.

PHAL 6105 - Anatomy and Physiology for Speech-Language Pathology. Three (3) credits.
This course is a comprehensive study of the anatomical and physiological bases of speech production, hearing and swallowing. Topics include structures, systems and mechanics of neurology, respiration, phonation, resonance, articulation, hearing and swallowing, as well as the function of normal conditions and pathologies. This is a hybrid course.

PHAL 6106 - Linguistics and Acoustics in Communication Sciences and Disorders. Three (3) credits.
This is an introductory course on basic assumptions, methods and concepts of studying linguistics and acoustics, both as applied sciences to communication disorders. In the linguistics component the nature, structure and use of language will be examined, as well as the application of linguistic theories to speech and language clinical intervention. The acoustics component examines the relationship of sound to the human hearing, as well as, to speech production, including the and the acoustic consequences of articulatory movements. The course addresses perceptual phenomena of normal hearing supported by reviews of methods and principles of psychophysical measurement of hearing theory. The acoustic and linguistic characteristics of several Spanish language dialects, as well as, of American English, are discussed. This is a hybrid course.

PHAL 6115 - Language Acquisition. Three (3) credits.
Study of the natural development of the communication in normal Spanish-speaking children, in the period from preschool in terms of sequence, content, form and use. The procedure and language measurement techniques for children and adults are cover in this course too. Experience in preparing and administration of therapeutic plan. Study of language development from infancy through adolescence, with emphasis in the Spanish-speaking typical child. The course will cover theories of language acquisition and development, the biological basis of acquisition and development, and the basic stages of typically and atypically developing populations, regarding language. Procedures for language analysis and child screenings for referral to a complete diagnosis are also discussed. This is a hybrid course.

PHAL 6116 - Swallowing Disorders in Children and Adults. Three (3) credits. Pre-requisites: PHAL 6105.
Study of the etiology, characteristics, assessment, intervention and clinical management of feeding and swallowing problems in children and adults. The course addresses normal and abnormal swallow physiology, including pediatric feeding disorders. The course will cover both clinical management and instrumental assessment techniques to evaluate swallowing function using validated screens and assessment tools appropriate for varied cultural groups. Interdisciplinary and interprofessional approaches to the assessment and treatment will also be discussed. This is a hybrid course.

PHAL 6117 - Intervention Strategies in Speech Language Pathology. One (1) credit.
This course is an overview of planning, implementing and evaluating on intervention in speech language pathology. The students will learn how to plan the intervention with measurable and achievable goals that meet the client's needs. Topics covered will include time management in therapy sessions, materials selection, therapeutic techniques, data collection, use of technology for therapy, and maintaining of records

to demonstrate the person's achievement and to assist with monitoring and review of the general intervention plan. The course strategies consist of lectures, demonstrations, and group discussions. Videos will be used to accompany assigned readings.

PHAL 6118 - Voice and Resonance Disorders. Three (3) credits.
This course provides an overview of normal phonatory mechanism, laryngeal pathologies, voice assessment procedures, protocols and instrumentation, and vocal rehabilitation. Resonance disorders related with craniofacial anomalies as well as esophageal speech for laryngectomized patients. The primary focus of the course will be clinical; theoretical and technical material will be presented.

PHAL 6119 - Fluency Disorders. Three (3) credits.
This course will present students the theoretical and clinical basis of fluency disorders. Fluency disorders will be discussed in relation to anatomical, physiological, psychological, development, linguistic and cultural aspects. The student will learn about the principles and methods of counseling, prevention, assessment, differential diagnosis and treatment used with children and adults who have fluency disorders. Clinical considerations will be discussed to treat disorders of fluency that affect the function, activity and participation of the individual, whereas their personal and contextual factors. Teaching strategies include analysis of speech samples, clinical observations and case studies, among others.

PHAL 6120 - Child Language Disorders: Infancy through Preschool Years. Three (3) credits. Pre-requisites: PHAL 6115.
This course introduces students to the scientific and clinical study of the nature, causes, diagnosis, treatment, and life span issues of language disorders in infants, toddlers and preschoolers. Topics will include discussions on the etiological factors; current hypotheses used to explain children's language disorders, and associated problems. Students will learn how to describe and to create profiles of children's language skills. In addition, students will develop the knowledge required to use appropriate assessment and intervention procedures. The course also addresses the different service deli- very models, language-teaching techniques, and current approaches for intervention.

PHAL 6121 - Language Disorders in School-Age Children. Three (3) credits. Pre-requisites: PHAL 6115.
This course addresses the nature and characteristics of language disorders in school-age children, including adolescents. The course discusses contrasting views on the study of language problems, examines the relationship between oral language development and literacy skills, and studies the language characteristics of children with specific language impairments, learning disabilities, intellectual disabilities, autism spectrum disorders, hearing impairment, auditory processing problems, and acquired aphasia. The course addresses evidence-based practice procedures for the assessment and intervention of language learning problems in school-age children including those who are from culturally-linguistically diverse groups. In addition, the course peruses the laws that regulate services to children with language learning problems. Different instructional strategies are used, lectures, group discussions, interactive modules, videoconferencing, and synchronous sessions. This is a hybrid course.

PHAL 6235 - Seminar: Evidence-Based Practice in Speech-Language Pathology. One (1) credit.
This seminar is an introduction to the basics of the evidence- based practice approach and the implementation tools available to make evidence-based care decisions for patients with communication disorders. Through the course, the student will learn about development of answerable clinical questions, which will define the criteria for effective literature search strategies. The student will know about available resources essential to a successful literature search. This course is offered as an on-line course.

PHAL 6236 - Seminar: Ethical, Legal, Professional and Public Health Issues in Speech-Language Pathology. One (1) credit.
This seminar examines professional and ethical issues related to speech-language pathology (SLP). The seminar also includes a review of regulations and requirements for professional practice in SLP, service provision and management of health information. Through the course, students will learn about current issues related to professional practice and clinical service delivery in Speech Language Pathology. This course is offered as an on-line course.

PHAL 6305 - Assessment and Diagnostic in Speech-Language Pathology. Three (3) credits.
This course focuses on the evaluation and diagnosis process as it relates to a variety of communication disorders across cultures. This includes indices of diagnostic accuracy (sensitivity and specificity) for test selection and test interpretation, as well as non-biased assessment methods for individuals from culturally diverse backgrounds. Students will learn to interpret, integrate and synthesize information in order to reach informed clinical decisions regarding treatment, referrals, and related recommendations. The course also includes discussions regarding the process of clinical reporting as well as discussions of concepts related to formal testing, such as: instrument, normative data, reliability, and validity.

PHAL 6308 - Research Design in Speech-Language Pathology. Two (2) credits.
This course is designed to increase graduate students understanding and appreciation of the role of research in enhancing clinical practice in Speech-Language Pathology. Students will be provided with sufficient information about research design, data collection, analysis and reporting to become knowledgeable consumers of research with his/her field. Students will recognize the value of systematic inquiry as a part of clinical practice and research in communication sciences disorders. This is an hybrid course.

PHAL 6315 - Seminar: Multilingual and Multicultural Issues in Speech-Language Pathology. One (1) credit. Pre-requisites: PHAL 6120, PHAL 6121, PHAL 6512.
This course introduces students to principles related to linguistic variation and multiculturalism, and the influence of these aspects in the management of communication and swallowing disorders in children and adults. Theoretical and clinical issues related to individuals who have a diverse social, cultural and linguistic background are correlated. Discussions on multilingual children's language development, second language learning and later acquired language disorders in adults are included. The principles related to nonbiased assessment and intervention of communication and swallowing disorders in multicultural populations across the life span are presented. The course is offered as an online course.

PHAL 6316 - Assessment and Intervention of Individuals with Hearing Loss. Two (2) credits. Pre-requisites: AUDI 7118.
The course deals with the effects of hearing loss on perceptual, cognitive, communicative, educational, occupational, social and emotional aspects of life across the life span. The student will learn about the common pathologies which cause hearing loss across the different stages of life. They will analyze How hearing impairment impacts speech understanding and communication. The course addresses the historical development of oral and manual philosophies, principles of amplifications systems and assistive technology. Different assessment and intervention approaches used to habilitate and rehabilitate hearing impaired individuals through the lifespan are discussed. Students will gain an understanding of the psychosocial aspects of hearing loss and counseling strategies for the patient, family and significant others. Different instructional strategies are used, lectures, group discussions, interactive modules, videoconferencing, and synchronous sessions. This is a hybrid course. This is a hybrid course.

PHAL 6417 - Neuroscience of the Cognitive, Communication and Swallowing Mechanism. Three (3) credits. Pre-requisite: PHAL 6105.
This course discusses the structure and function of the human nervous system as related to speech, language, hearing and swallowing. The course emphasizes on the study of the reception and integration of sensation, language learning and usage, production of verbal and non-verbal responses, and swallowing processes. Typical and atypical neurological functions for communication and swallowing are examined as well as associated disorders. Different instructional strategies are used, lectures, group discussions, online interactive modules, online professional article reading, recorded and synchronous lectures. This is a hybrid course.

PHAL 6420 - Capstone Course in Speech-Language Pathology. Three (3) credits. Pre-requisite: PHAL 6235.
In this course, the students will integrate the knowledge and skills acquired in previous courses through the realization of a capstone project. Students will work in the capstone project in order to solve a problem using evidence-based practice (EBP) framework. Presentation of case scenarios will be used and students will formulate the key question(s), search educational and health-related databases, and select and appraise available evidence. At the end of the course, the students will apply the evidence in a clinical context through a written document and an oral presentation.

PHAL 6509 - Speech and Language Problems in Children with Environmental Deprivation and Children with Mental Retardation. Two (2) credits.
Discussion about communicative difficulties of children who come from areas of environmental deprivation. Difference vs approaches are covered; also, clinical modifications required of the speech-language pathologist in order to provide evaluation and therapy to these children. Study of language and speech patterns of children with various degree of mental retardation. Clinical techniques developed for speech and language stimulation of this population are also covered.

PHAL 6512 - Disorders of Communication in Children and Adults with Neurological Problems. Three (3) credits.
This course addressed the study of the etiology, characteristics, assessment, intervention and clinical management of speech and language problems in children and adults with neurogenic disorders. The course addresses the etiological factors, assessment and intervention issues associated with varied cultural groups. Different instructional strategies are used, lectures, group discussions, online interactive modules, online professional article reading, recorded and synchronous lectures. This is a hybrid course.

PHAL 6514 - Cleft Palate. Two (2) credits.
The course will include study of the types and degree of palatal and facial malformations related to congenital and acquired clefts, and management techniques of related communicative disorders.

PHAL 6519 - Articulation Problems and Phonological Disorders. Three (3) credits.
Anatomic, physiology, acoustic, and perceptual aspects of the articulatory mechanism will be studied. The course includes the description of the adults normal Phonological System (in both, English and Spanish languages). Emphasis will be given to research concerning normal, delayed and, deviated phonological development in both languages. The most relevant theories about phonological development will be discussed; and these theories will be applied to evaluation, diagnostic, and treatment processes of articulation problems and phonological disorders. Formal and informal aspects of evaluation, diagnosis, and treatment in the areas are also discussed, as applied to special populations. This is a hybrid course.

PHAL 6520 - Seminar: Supervision in Speech-Language Pathology. One (1) credit.
This seminar will provide students with guidelines to fulfill roles and responsibilities related to supervision, as specified in the scope of practice of the speech-language pathologist. Emphasis will be placed on

professional issues and regulations relevant to supervision of support personnel, such as the speech-language therapist in Puerto Rico. This course is offered as an online course

PHAL 6521 - Speech and Language Disorders in Children with Autism. One (1) credit.
The course will provide for discussions about the characteristics of Infantile Autism and Schizophrenia in children, including the communication abilities of both groups. Current approaches for evaluating and treatment speech difficulties in these children are also covered.

PHAL 6522 - Diagnosis and Rehabilitation of Children with Neurological Problems. Two (2) credits.
The course will provide for the study of the etiology, incidence, diagnosis, and habilitation of speech and language disorders secondary to brain damage in children. Materials and methods for evaluation and treatment of these difficulties are discussed.

PHAL 6524 - Dyslexia and Dysgraphia in the Child. One (1) credit.
The course will provide for the different etiologies and symptoms of visual-language impairment. Also diagnosis and management of patients with disorders of reading and writing.

PHAL 6542 - Introduction to Assistive Technology in the area of Augmentatives and Alternative Communication. Three (3) credits. Pre-requisites: HLAG 6533, PHAL 6512, PHAL 6522
This course will lead the student towards the development of knowledge and skills required for the use of Augmentative and Alternative Communication (AAC). Students will learn about terminology and application of AAC, augmentative communication system components, the evaluation process for an appropriate selection of an assistive device, and intervention strategies for individuals with limited or nonfunctional speech. A discussion of recent trends and future needs, professional credentials, as well as strategies for keeping up with new technology will be included. Students will participate of practical experiences where they will have the opportunity to obtain hands-on experience with electric and non-electric low and high tech AAC systems. This is a hybrid course.

PHAL 6601 - Clinical Practicum I in SLP (Clinical Observations). Half (0.50) credit.
This is the first course of the clinical practicum course sequence, designed to complete a minimum of 400 clock hours of supervised clinical experience in the practice of speech-language pathology (SLP), as required by the accreditation agency. This first course is designed to provide focus and structure for students to complete the 25 clock hours of clinical observations within the scope of practice in SLP. Through the course, the student will complete guided observations focused on learning the scope of practice, the variety of intervention activities and clinical settings, and their relevance for the profession. The observations will include diagnostic and therapeutic sessions. Students could observe both video recordings and direct clinical activities. The student will complete written reports and reflections about their clinical observations. All observations will be arranged and approved by the course instructor.

PHAL 6602 - Clinical Practicum II in Speech Language Pathology. One (1) credit.
Clinical Practicum II is the second of four clinical practicum courses in speech-language pathology. The clinical practicum component allows the student to demonstrate his/her knowledge and to develop skills within the scope of practice of the profession with client/patient population across the life span and from culturally/linguistically diverse backgrounds. The student will acquire and demonstrate prevention, assessment/diagnosis and intervention skills, as well as interactional and professional/personal qualities at the beginner level. The student will begin to develop skills in oral and written communication towards entry level of professional practice. This second course will provide introductory practice of direct clinical contact under the direct supervision of a qualified clinical instructor with a maximum level (75-100%) of supervision to facilitate the student's acquisition of essential clinical skills.

PHAL 6603 - Clinical Practicum III in Speech-Language Pathology. Three (3) credits.
Clinical Practicum III is the third of four clinical practicum courses in speech-language pathology. The clinical practicum component allows the student to demonstrate his/her knowledge and to develop skills within the scope of practice of the profession with client/patient populations across the life span and from culturally/linguistically diverse backgrounds. The student will acquire and demonstrate prevention, assessment/diagnosis and intervention skills, as well as interactional and professional/personal qualities at an intermediate level. The students will continue to develop skills in oral and written communication towards entry level of professional practice. This third course will enable students to complete at least 55% of the required hours of direct clinical contact. This will be conducted under direct supervision of a qualified clinical instructor with at least a moderate level (50%) of supervision to facilitate the student acquisition of essential clinical skills.

PHAL 6604 - Clinical Practicum IV in Speech-Language Pathology. Three and a half (3.50) credits.
Clinical Practicum IV is the fourth and final clinical practicum course in speech-language pathology. The clinical practicum component allows the student to demonstrate his/her knowledge and to develop skills within the scope of practice of the profession with client/patient populations across the life span and from culturally/linguistically diverse backgrounds. The student will acquire and demonstrate prevention, assessment/diagnosis and intervention skills; and interaction and professional/personal qualities at an advance practicum level, more consistent with an entry level professional. The student will demonstrate skills in oral and written communication consistent with an entry level professional. In this course, the student will complete the required hours of direct clinical contact under the direct supervision of a qualified clinical instructor with at least a minimum level of 25% of the time of supervision to facilitate the student's acquisition of essential clinical skills.

REME 6105 - Medical Record Sciences. Two (2) credits.
Introductory course for the Medical Record field of studies. Study of the Medical Record as a historical document, its relationship with the history of Medicine and accrediting agencies. Laboratory experience in the field and in the classroom is provided.

REME 6109 - Health Information System. Two (2) credits.
Study of basic concepts applied to the design and management of an Information System. The acquired knowledge will enable the Medical Record Administrator to control the organization's behavior during the process of establishing and operating an Information System.

SALP 6500 - Medical Background. Three (3) credits.
Study of the basic principles of structure and functioning of the human organism and of the human organism historical data, causes of disease, disturbance of the circulatory system. Inflammation, immunity and hypersensitivity, infections, parasites, neoplasms, radiation, hereditary diseases, and the medical terminology related to these topics.

SALP 6501 - Medical Terminology. Three (3) credits.
Study of the anatomical and physiological principles of the systems of the human organism and of the principal diseases that affects them. Includes the study of the medical terminology related to these systems.

TEFI 5000 - Social Aspects of Illness. Three (3) credits. Pre-Requisites: CISO 3121, CISO 3122, PSIC 3005
The course elaborates, in a general way, a theoretical framework, which comprises, from the mechanical to the complex, the worldview utilized in the human sciences to account for the ill human being. It provides for the discussion of the processes by which the ill subject is constituted through the everyday practices of medicine/health professions. Given its importance to the field of physical therapy, the course will analyze the communication processes in the interaction physiotherapist-patient, paying particular attention to the

notion of body movement as product and producer of signification as well as to the position occupied by the physical therapist in the resignification process of the ill body. The course is opened to graduate students from other programs.

TEFI 7011 - Clinical Kinesiology I. Two and a half (2.50) credits. Pre-requisites: ANAT 7425.
This is the first of two courses that deals with the study of human motion, which includes kinematics and kinetics required for the understanding of normal and abnormal movement. Anatomical, biomechanical, and physiological principles are applied in the analysis of static and dynamic postures. Students identify and analyze the forces acting on body segments and their effects during normal functional activities. The composition and biomechanical behavior of the principal tissues of the musculoskeletal system are described and compared. The course also provides the foundation for understanding some physical therapy test and measures, and therapeutic applications. The effects of common structural deformities, immobilization, and injuries of the musculoskeletal system are addressed. The structure and function of the trunk and spine are presented. Web-enhanced learning and supervised laboratory experiences are included.

TEFI 7012 - Clinical Kinesiology II. Three (3) credits. Pre-requisites: TEFI 7011.
This course is a continuation of Clinical Kinesiology I. It deals with the study of human motion, which includes kinematics and kinetics required for the analysis of normal and abnormal movement. Anatomical, biomechanical, and physiological principles are applied in the analysis of motion of the appendicular system. The course also addresses common deviations from normal structure and function seen in physical therapy practice related to the musculoskeletal system of the extremities. Kinematics and kinetics of gait are also included. Web-enhanced learning and supervised laboratory experiences are used.

TEFI 7015 - Introduction to Professional Socialization. Three (3) credits.
This course addresses the role of the physical therapist as a member of the health care team, as well as physical therapy practice expectations and domains. Models of clinical reasoning, including enablement/disablement models and decision-making algorithms for patient care management, are presented. Legal, ethical, regulatory, and practice expectations issues that impact the delivery of physical therapy services are also addressed. The student is expected to reflect on the scope of physical therapy, and on the impact that becoming a physical therapist has in his/her social responsibilities. Instructional strategies include lectures, discussions, debates, and appraisal of a public hearing, among others.

TEFI 7016 - Physical Therapist as Educator and Communicator. Three (3) credits. Pre-requisites: TEFI 7015.
This course provides an introduction to the education and communication processes in physical therapy. The student utilizes and applies basic concepts needed to plan and use the teaching situation as a tool in physical therapy practice. Basic concepts in communication processes during face-to-face interaction, as well as written clinical documentation are included. The student is expected to develop basic skills in the analysis of communication processes as well as in the proposition of alternative strategies. The topics are addressed through lectures, group discussion, group projects, and case studies, among others.

TEFI 7025 - Research in Physical Therapy I. Three (3) credits.
This course is the first of five courses designed to create a culture of inquiry, considering research as an integral part of physical therapy practice. It includes the discussion of the elements and approaches to research, as a foundation for evidence-based practice. Quantitative research methods are covered, with emphasis on their contribution to theory testing. The student is expected to critically analyze published research literature, including systematic reviews. The following instructional strategies are used: lecture, discussions, oral presentations, search and analysis of literature, group projects, and computer laboratory experiences.

TEFI 7027 - Research in Physical Therapy II. Two (2) credits. Pre-requisites: TEFI 7025.
This is the second course of a five-course sequence on research. It provides a framework for understanding qualitative research designs and literature. The contribution of qualitative research to evidence-based practice and theory development is discussed. Philosophical assumptions and qualitative research methods are also presented. Students are expected to interpret and critically analyze professional qualitative literature related to physical therapy practice. Students are also expected to propose a potential researchable problem following a specific area of interest and framed within the continuum of experimental-qualitative research designs. The following teaching strategies are used: lecture, discussions, oral presentations, search and analysis of literature, and group projects.

TEFI 7031- Evidence-Based Practice in Physical Therapy I. Two (2) credits. Pre-requisites: TEFI 7025.
This is the first of two courses that focuses on how to apply the best available evidence in practice, using an evidence-based practice framework. Real or hypothetical clinical cases are addressed using a Problem Based Learning approach. Students are expected to critically read, evaluate, and apply research findings in clinical decision-making. Class will be divided in small groups of five to six students and will be assigned to a facilitator/tutor throughout the semester. Active participation of students in small group discussions is expected. Active participation and interaction among members of the group is required during each meeting.

TEFI 7032 - Evidence-Based Practice in Physical Therapy II. Two (2) credits. Pre-requisites: TEFI 7031.
This is the second of two courses which focuses on how to apply the best available evidence in practice, using an evidence-based practice framework. The level of complexity of the cases discussed is increased in this course. Real or hypothetical clinical cases will be addressed using a Problem Based Learning approach. Students are expected to critically read, evaluate, and apply research findings in clinical decision-making. Class will be divided into small discussion groups where active participation of students is expected. Active participation and interaction among members of the group is required during each meeting.

TEFI 7035 - Basic Clinical Skills in Physical Therapy. Two (2) credits.
This is an introductory course geared for the student to develop safe and effective handling of patients/clients. Approaches for infection control, preparation for patient care, assessment of vital signs, draping and positioning, as well as proper body mechanics are addressed throughout the course. Proper training in basic mobility activities for patients/clients with functional limitations is also included. Supervised laboratory experiences are included in all the units of the course.
TEFI 7045 - Clinical Exercise Physiology. Two and a half (2.5) credits. Pre-requisites: TEFI 7035.
This course presents the molecular, cellular, and system physiology with emphasis in the musculoskeletal, cardiovascular, and pulmonary function. It addresses the physiological principles required for understanding the acute responses and chronic adaptations of the human body system's function across the lifespan, in pathological states, and in response to physical therapy intervention with emphasis in the physiological effects of exercise. The student is expected to detect and interpret physiological changes related to exercise that influence the physical therapy management of patients/clients. Teaching strategies such as lectures, group discussions, and supervised laboratory practice are used.

TEFI 7046 - Clinical Neuroscience. Three and a half (3.50) credits. Pre-requisites: TEFI 7045, ANAT 7425.
Through lectures, discussions, and supervised laboratory experiences, this course provides basic knowledge of structure, organization, and function of the central nervous system in relation to disease and behavior. It addresses the areas of sensory processing, motor control, nervous control of visceral and somatic functions, plasticity, and cognitive functions, among others. The normal function of the human nervous system and the pathology associated with the most common neurological conditions seen in the physical therapy scenario is also discussed. It is expected that the physical therapy student understands the central nervous system as pivotal for clinical decision-making and patient/client management in physical therapy.

TEFI 7051- Pathophysiology I. Four (4) credits. Pre-requisites: TEFI 7045.
This course provides an introduction to the pathophysiological mechanisms associated with disease and trauma across the lifespan, caused by inflammation, infection, and genetic disorders, among others. The etiology, epidemiology, diagnosis and differential diagnosis, clinical manifestations, associated comorbidities, systemic involvement, and medical management are discussed. It addresses the diseases and disorders of the circulatory, respiratory, hematologic, endocrine, digestive, genitourinary, reproductive, immunologic, and integumentary systems most frequently encountered in the practice of physical therapy. Students are expected to apply concepts of pathophysiology and clinical correlations associated with the physical therapy practice. Lectures and case discussions are used as teaching strategies.

TEFI 7052 - Pathophysiology II. Four (4) credits. Pre-requisites: TEFI 7051.
This course is a continuation of Pathophysiology I. It addresses the pathophysiological mechanisms associated with disease and trauma across the lifespan, caused by inflammation, infection, and genetic disorders, among others. The etiology, epidemiology, diagnosis and differential diagnosis, clinical manifestations, associated comorbidities, systemic involvement, and medical management are discussed. It addresses environmental and occupational medicine, diseases and disorders of the musculoskeletal system, as well as psychiatric, otorhinolaryngology, and ophthalmologic conditions most frequently encountered in the practice of physical therapy. Students are expected to apply concepts of pathophysiology and clinical correlations associated with the physical therapy practice. Lectures and case discussions are used as teaching strategies.

TEFI 7055 - Health Promotion, Wellness and Prevention. Three (3) credits. Co-requisites: TEFI 7045.
This course addresses the basic concepts of health, wellness, fitness, prevention, screening for risk, and behavior change. These concepts are applied at individual and community levels. Students perform a risk screening, and a risk assessment; they also generate goals for themselves and for a specific community with special needs. Plans geared to decrease risk and increase health and wellness are developed, implemented and evaluated. The following teaching strategies are used: lectures, small group discussion, classroom exercises and community experiences.

TEFI 7065 - Physical Agents. Two (2) credits.
This course includes the application of selected physical agents, including thermotherapy, cryotherapy, mechanical traction, electromagnetic radiation, hydrotherapy, compression, and sound agents. It emphasizes the physiologic therapeutic effects of these physical agents commonly used as part of the physical therapy intervention. Students are expected to develop skills in the application of physical agents, including the specific screening, examination, and evaluation procedures important for a safe intervention. Research evidence that supports the use of these agents is discussed. Learning strategies include lectures, demonstrations, case studies, and laboratory sessions.

TEFI 7066 - Pharmacology for Physical Therapists. One and a half (1.5) credits. Pre-requisites: TEFI 7045.
This course includes basic principles of pharmacology as well as the most common drugs used for patients/clients seen in physical therapy. It addresses indications, contraindications, drug interaction, adverse reactions, and side effects of these medications and their impact on physical therapy intervention. Emphasis is given in the ability to recognize how a medication can assist or hinder the physical therapy patient care. The student is expected to take into consideration pharmacological therapy in the management of the physical therapy patient/client. Teaching strategies include lectures and case discussion.

TEFI 7067- Imaging for Physical Therapists. One and a half (1.5) credits. Pre-requisites: ANAT 7425.
This introductory course presents the most common imaging techniques used for patients seen in physical therapy. General principles related to indications, strengths, and limitations of each method are discussed. The student is expected to interpret imaging findings as they relate to clinical decision making in physical

therapy patient/client. Teaching strategies include lectures, case discussion, and discussion of imaging reports.

TEFI 7101 - Clinical Education Experience III. Ten (10) credits. Pre-requisites: TEFI 7209, TEFI 7305, TEFI 7306, TEFI 7307, TEFI 7308, TEFI 7309, TEFI 7310. Co-requisites: TEFI 7102, TEFI 7103, TEFI 7104.
This is the third course of 5 clinical education experiences. It is composed of 11 weeks. The student is assigned to an outpatient, acute, or rehabilitation setting, including home health. The student must approve Clinical Management of the Neurologically Impaired Child, Health Care System and Administration in PT courses, and standardized patient summative experience ii before begins the clinical education practice iii. Emphasize is given on skilled examination, evaluation, diagnosis, interventions, case management, and documentation using the International Classification Functional System as framework. Practice of management skills and use of evidence-based practice are expected as well as professional behavior and active participation in the planning and design of the clinical experience. At completion, of course the student should demonstrate intermediate performance according to the Clinical Performance Instrument grading scale. Grading System: Passed (P), Not Passed (NP)

TEFI 7102 - Clinical Management of the Neurologically Impaired Child and other Pediatric Conditions. Two and half (2.5) credits. Pre-requisites: TEFI 7305, TEFI 7310.
This course is offered during the first 7 weeks of the semester. It addresses the physical therapy management of the pediatric client with movement disorders secondary to neuromuscular conditions and other health conditions. It focuses on physical therapy examination, evaluation, diagnosis, and prognosis, intervention for impairments in body structures and function and activity limitations; and discharge planning. Differential diagnosis and referral to other practitioners are included. It is a case-based course, starting with simple situations and progressing to complex ones. It includes the management of neurological injuries, progressive and non-progressive conditions. Current research, within the context of evidence-based practice, is examined. The student is expected to demonstrate skills in the management of clinical cases. Demonstrations, lectures, visits to clinical sites, and supervised laboratory practices are used as teaching strategies.

TEFI 7103 - Research Project III. Two (2) credits. Pre-requisites: TEFI 7308.
This course is the third on the continuum of the research project. It includes the interpretation of results, drawing of conclusions, and writing the final report, as part of the completion of the group research project. The advisor must approve the final written project. Students will orally present the final project to peers and faculty. The project must be submitted for publication in a peer-reviewed journal selected by students and approved by advisor. Students will be conducting the research project under the supervision and mentorship of faculty. Grading System: Passed (P), Not Passed (NP)

TEFI 7104 - Health Care System and Administration in Physical Therapy. Three (3) credits. Pre-requisites: TEFI 7015, TEFI 7016, TEFI 7027.
Through lectures, case analysis, and group discussions this course provides conceptual and technical background in the area of administration and consulting in physical therapy. Topics to be discussed include the healthcare delivery system, strategic and operational planning, quality improvement and risk management, budgeting, direction and supervision, managerial roles and interpersonal skills, marketing and public relations, billing and reimbursement, and legal and ethical issues related to the management of physical therapy services. The student is expected to apply principles of leadership and management pertinent to physical therapy practice.

TEFI 7105 - Clinical Management of Spinal Dysfunctions. Two and a half (2.5) credits. Pre-requisites: TEFI 7051, TEFI 7066, TEFI 7067, TEFI 7011.
This course addresses the physical therapy management of patients/ clients with dysfunctions of the spine. Emphasis is given to the examination, assessment, diagnosis, prognosis, intervention, and discharge planning in physical therapy. Differential diagnosis and referral to other practitioners are included. In addition, age-related musculoskeletal disorders of the spine are covered. Instructional strategies include: demonstrations, group discussions, supervised laboratory practices, lectures, case studies, visits to clinical facilities, and literature search in selected topics. It is expected that the physical therapy student develop skills in the management of spine dysfunctions.

TEFI 7106 - Electrotherapeutic and Electrodiagnostic Procedures. Two (2) credits. Pre-requisites: TEFI 7046.
This course discusses the physics, and the physiological and clinical effects of electric currents used for therapeutic purposes. Electrodiagnostic tests and electrotherapeutic modalities currently used in physical therapy practice are presented. Research evidence that supports the use of these tests and modalities is discussed. It is expected that the student demonstrates sound clinical judgment in the use of such procedures. Instructional strategies include lectures, demonstrations, and supervised laboratory practice.

TEFI 7111 - Clinical Education Experience I. Two (2) credits. Pre-requisites: TEFI 7055. Co-requisites: TEFI 7105, TEFI 7106.
This is the first of five clinical experiences, consisting of four hours a week where the student will be assigned to an outpatient, acute or rehabilitation setting. This experience allows the student to integrate course content presented in the pre-requisites and co-requisite courses. The student begins to think, feel, and act as a physical therapist and should demonstrate professional behavior. The student is expected to actively participate in the planning and design of the clinical experience. At the end of this practice, the student is expected to demonstrate beginner performance according to the Clinical Performance Instrument grading scale. This course may require traveling outside of the San Juan Metropolitan Area. Grading System: Passed (P), Not Passed (NP)

TEFI 7113 - Clinical Education Experience IV. Ten (10) credits. Pre-requisites: TEFI 7101, TEFI 7102, TEFI 7104.
This is the fourth of five clinical experiences, composed of 10 weeks where the student can be assigned to an outpatient, acute or rehabilitation setting, including home health. Experience focus on skilled examination, evaluation, diagnosis, interventions, case management, and documentation using the International Classification System as framework and evidence-based practice in patient/client across life span. Professional behavior and active participation in the planning and design of his/her clinical experience according to previous clinical experience is expected. At the summative (final) evaluation, the student should demonstrate Advanced Intermediate Performance according to the Clinical Performance Instrument grading scale. The student can be assigned to a clinical site in Puerto Rico or the United States. This course may require traveling and housing arrangements. Grading system: Passed (P), Not Passed (NP)

TEFI 7114 - Clinical Internship. Twenty (20) credits. Pre-requisites: TEFI 7113.
This is the last clinical experience, composed of 20 weeks. The student can be assigned to an outpatient, acute or rehab setting. The student will function safely and independently as an entry-level on skilled examination, evaluation, diagnosis, interventions, case management and documentation using the International Classification System as framework and evidence-based practice in patient/client across life span. This course requires the specific integrated practice of administration and consultation skills. Student is required to take the academic Practice Exam and Assessment Tool during this clinical experience. The first trial will be during week 10 and the second during week 16 of internship. The student is expected to demonstrate professional behaviors and actively participate in the planning and design of the clinical

experience. The student can be assigned to a clinical site in Puerto Rico or The United States. This course may require housing and traveling arrangements. Grading system: Passed (P), Not Passed (NP)

TEFI 7201 - Research Project I. Two (2) credits. Pre-requisites: Approved the courses of the first year of the program.
This course will allow students to develop a research proposal in a physical therapy content area. Students are expected to propose a group research project following a specific area of interest in physical therapy. Each group of students will be assigned to a mentor, and a reader will be selected. Feasibility of project completion based upon the curriculum period and availability of resources must be demonstrated. The mentor and reader must approve the final proposal. The submission process for Institutional Review Board approval has to be completed. Weekly progress meetings are required. As part of the students' academic work, extensive reading and writing are expected.

TEFI 7205 - Clinical Management of Upper and Lower Extremities Dysfunctions. Two and a half (2.50) credits. Pre-requisites: TEFI 7012, TEFI 7032, TEFI 7052, TEFI 7105, TEFI 7106.
This course addresses the physical therapy management of patients/ clients with musculoskeletal dysfunctions of the upper and lower quadrants across the lifespan. Emphasis is given to the examination, evaluation, diagnosis, prognosis, intervention, and discharge planning in physical therapy. Differential diagnosis and referral to other practitioners are included. Instructional strategies include lectures integrated to supervised laboratory practices, group discussions, case studies, demonstrations, visits to clinical facilities, and the use of software for exercise prescriptions, among others. The student is expected to demonstrate skills in management of upper and lower extremities musculoskeletal dysfunctions.

TEFI 7206 - Motor Development and Learning. Three (3) credits. Pre-requisites: TEFI 7012, TEFI 7046.
This course presents normal motor development and principles of motor control and motor learning across the lifespan, using the patient-management model. Current theories of motor control and motor learning, and their relevance in the motor performance and skill acquisition of both healthy and persons with motor dysfunction are included. Motor control issues and their relation to posture, balance, and mobility are discussed. Examination and evaluation of balance and gait are included. Current research in this area of study is emphasized. Students are expected to apply motor development and motor learning theories in physical therapy evaluation and intervention. Lectures, case discussions, and visits to clinical sites are used in this course.

TEFI 7207 - Clinical Management of Integumentary Dysfunctions. One and half (1.50) credits. Pre-requisites: TEFI 7052, TEFI 7066, TEFI 7067, TEFI 7106.
This course focuses on the physical therapy management of patients with integumentary dysfunctions such as vascular ulcers, neuropathic ulcers, burns, surgical wounds, traumatic injuries, and scar tissue. It includes screening, integumentary tests and measures, and evaluation of the integumentary system as part of the clinical decision-making process. It encompasses interventions such as compression, dressing, protective/adaptive equipment, exercise, and other therapeutic procedures. Differential diagnosis and referral to other practitioners is also addressed. Students are expected to demonstrate skills in the management of clinical cases. Teaching strategies include lectures, case discussion, supervised laboratory experiences, and visits to clinical facilities.

TEFI 7208 - Clinical Management of Cardiovascular and Pulmonary Dysfunctions. Three (3) credits. Pre-requisites: TEFI 7012, TEFI 7052, TEFI 7055.
This course addresses the physical therapy management of patients/ clients with primary acute, chronic dysfunction, and secondary dysfunction of the cardiopulmonary system. It presents age-related cardiopulmonary disorders and addresses the examination, evaluation, diagnosis, prognosis, intervention in physical therapy, and discharge planning. Differential diagnosis and referral to others practitioners are

included. The course is case-based, starting with simple, progressing to complex ones. The student is expected to demonstrate skills in the exam, evaluation, and intervention of clinical cases. Lectures, demonstrations, supervised laboratory experiences, and visits to clinical facilities are used as teaching strategies.

TEFI 7209 - Clinical Education Experience II. Two (2) credits. Pre-requisites: TEFI 7205, TEFI 7206, TEFI 7207, TEFI 7208, TEFI 7111.
This is the second of five clinical experiences, composed of six weeks where the student can be assigned to an outpatient, acute, or rehabilitation setting, including home health. Experiences focus on practice of clinical skills while integrating content presented in the pre-requisites and previous courses. This practice emphasizes basic skills in examination, evaluation, diagnosis, intervention, case management, and documentation of patients/clients with musculoskeletal, cardiovascular, pulmonary, integumentary, and neuromotor impairments. Proper communication and professional behavior are expected. The student will actively participate in the planning and design of his/her clinical experience. At the end of this practice, the student is expected to demonstrate advanced beginner performance according to the clinical performance instrument grading scale. This course may require traveling and housing outside of the San Juan Metropolitan Area. Grading System: Passed (P), Not Passed (NP)

TEFI 7305 - Prostheses and Orthoses. Two (2) credits. Pre-requisites: TEFI 7205, TEFI 7207, TEFI 7208.
This course addresses basic principles of lower extremity prostheses, as well as trunk, upper and lower extremity orthoses. It includes components, principles of biomechanics, recommendations, fitting, and static and dynamic alignment. Students are expected to develop skills in examination and training in the use of such devices. They are also expected to develop skills in physical therapy management of patients with lower extremity amputations from preoperative phase to training in advanced activities with lower extremity prosthesis. Basic principles of upper extremity prostheses are included. Lectures, guest speakers, visit to clinical sites, and supervised laboratory experiences are used in this course.

TEFI 7306 - Ergonomics. One (1) credit. Pre-requisites: TEFI 7205, TEFI 7208.
This course includes the physical therapy management of clients in the work context. Ergonomic concepts are presented including work analysis, injury prevention, and work as a functional activity, among others. Students are expected to develop physical therapy skills in this area of practice. Instructional strategies will include lectures, demonstrations, visits to work facilities, and supervised laboratory practices.

TEFI 7307 - Clinical Management of Endocrine, Immunologic, Genitourinary, and Gastrointestinal Dysfunctions. One and a half (1.50) credits. Pre-requisites: TEFI 7012, TEFI 7208.
This course addresses the physical therapy management of patients/clients with dysfunction of the endocrine, immunologic, genitourinary, and gastrointestinal systems. The course addresses the elements of patient/client management in physical therapy, with emphasis in the application of the conceptual framework "International Classification of Functioning, Disability and Health (ICF)" as proposed by World Health Organization. Differential diagnosis, referral to other practitioners, and the collaborative relationships among team members in a multidisciplinary or inter-professional health care setting are included. The course is case-based, starting with simple, progressing to complex ones. The student is expected to demonstrate skills in the management of clinical cases. Supervised laboratory experiences are included.

TEFI 7308 - Research Project II. Two (2) credits. Pre-requisites: TEFI 7201.
This course is the second of three courses on the continuum of the research project. Each group of students will work on data collection and analysis as planned in the research proposal developed in the course Research Project I. Students will participate in a workshop on the use of the Statistical Package for the Social Sciences (SPSS) software. Progress meetings, as agreed by the mentor and students, are required. Extensive reading, research, and writing is expected. Grading System: Passed (P), Not Passed (NP)

TEFI 7309 - Social Aspects of Health and Illness. Three (3) credits. Pre-requisites: TEFI 7015, TEFI 7016.
This course presents an overview of the impact of social factors in the production of health and in the experience of illness and disability. It examines social determinants of health such as income, education, occupation, social class, gender, and race/ethnicity as they relate to health vulnerability, inequity, and disparity. It also includes the areas of cultural competent practice and health inequities as they apply to physical therapy practice. The course explores the role of the health professions in the construction of the experience of illness, emphasizing the embodiment of pain, grieving, and movement dysfunction. The student is expected to critically reflect on the influence of social models of health and illness as it relates to physical therapy care. Teaching strategies include lectures, small group discussions, written critical reflections, and concept mapping.

TEFI 7310 - Clinical Management of the Neurologically Impaired Adult. Two and a half (2.5) credits. Pre-requisites: TEFI 7209. Co-requisites: TEFI 7305.
This course addresses the physical therapy management of adult patient/clients with movement dysfunctions secondary to neuromuscular conditions. It focuses on the physical therapy patient/client management that includes examination, evaluation, diagnosis, prognosis, intervention for impairment in body structures and function, and activity limitations; and discharge planning. Differential diagnosis, referral to other practitioners, and patient advocacy are included. It is a case-based course, starting with simple situations and progressing to complex ones. It includes the management of neurological injuries, progressive and non-progressive conditions. Current research, within the context of evidence-based practice, is examined. The student is expected to demonstrate skills in the management of clinical cases. Demonstrations, visits to clinical sites, and supervised laboratory practices are used as teaching strategies.

TEOC 6001 - Foundations of Occupational Therapy I. Four (4) credits. Co-requisites: TEOC 6007, TEOC 6008.
This course introduces the student to the Occupational Therapy profession. The scope of Occupational Therapy practice and the historical and philosophical development of the profession are discussed. It includes theories, models of practice and frames of reference that underlay the practice of Occupational Therapy and how these guides clinical practice and provide a framework for understanding the client. Emphasis is placed on the role of engagement in occupations and purposeful activity in promoting health, in the prevention of disease and in the growth and fulfillment of human needs. Principles of clinical reasoning skills and evidence-based practice as they apply to Occupational Therapy are addressed. Fieldwork Experiences (Level I) are provided.

TEOC 6004 - Active Learning Seminar. One (1) credit.
This seminar uses a problem-based learning methodology, an active learning approach, and a face-to-face modality to understand and develop basic skills to perform the occupational therapy practice process. Students will develop clinical reasoning skills to identify occupational participation and performance challenges in individuals, groups and populations. Students will analyze cases to discuss the evaluation process, intervention types, approaches and methods to attain expected occupational therapy outcomes for each case. Scientific evidence, literature revisions, and students' integrated knowledge of previous and concurrent courses will guide the decision-making path to address occupational dysfunctions and risks in each case presented. A student-centered context will promote self-directed learning, collaborative learning, and teamwork and group interaction skills.

TEOC 6005 - Human Anatomy. Three and a half (3.5) credits.
This is a course in gross human anatomy with major comprehensive exploration on the structure and function of the skeletal and neuromuscular systems of the human body. It includes a description of regional anatomy and gross structure of the back, upper and lower limbs, head, and neck, as well as thoracic and abdominal regions. Basic concepts of cardiovascular and respiratory anatomy are also discussed. The course focuses on the anatomical structures that are critical to understanding human movement and function through lectures,

on-site and virtual laboratory experiences involving prosected cadavers, skeletal and radiographic material, anatomical models, audiovisual technology, and case studies. Throughout this course, students will gain an understanding of the anatomical structures that are important to support daily activities and occupational performance of humans. This course gives occupational therapy students essential knowledge relevant to occupational therapy practice.

TEOC 6006 - Basic Neuroscience. Four (4) credits. Pre-requisite: TEOC 6005
Through lectures and discussions, this course provides basic knowledge of the structure, organization and function of the central nervous system in relation to disease and behavior. It addresses the areas of sensory processing, motor control, and nervous control of visceral functions, plasticity and cognitive function, among others. It is expected that the Occupational Therapy student acquire a framework for understanding the nervous system as a basis to more advanced and detailed study in the area of Applied Neuroscience.

TEOC 6007 - Occupation from a Developmental Perspective. Four (4) credits. Co-requisites: TEOC 6001, TEOC 6008
This course provides the student an overview of the multidimensional occupational nature of the human being from a developmental perspective, including social and cultural aspects. Lifespan from birth to death is analyzed considering the occupations, client factors, performance skills, performance patterns, and context and environment. Each developmental stage is analyzed emphasizing theories and relevant frames of reference as well as roles, life tasks, life styles, issues and occupational risks. Laboratories experiences will be provided.

TEOC 6008 - Professional Development in Occupational Therapy. Three (3) credits. Co-requisites: TEOC 6001, TEOC 6007
This course provides students with learning experiences to facilitate acquisition of professional behaviours and skills needed to be a competent entry-level occupational therapist. It emphasizes growth of the student as a professional and as a person. Students develop self-awareness of values as determinants of behaviour and skills to support diversity and professionalism. The process of clinical reasoning in occupational therapy is discussed and basic reasoning skills are developed. Emphasis is given to the importance of leadership skills, professional ethics, and core values of occupational therapy. Ethical reasoning is used to analyse problems and generate solutions to ethical dilemmas. Students develop a service activity to demonstrate professional behaviours, leadership, and reasoning and collaboration skills in the context of service delivery. Laboratory experiences will be provided. This course will be offered utilizing a face-to-face teaching modality.

TEOC 6009 - Dimensions of Human Movement in Occupational Performance. Four (4) credits. Pre-requisite: TEOC 6005. Co-requisite: TEOC 6006
This course focuses on the importance of human movement for performing everyday activities and tasks from a biomechanical/physical, cognitive and psychosocial dimensions considering a variety of contexts that influence occupational performance. Principles of biomechanics, joint structure, muscle physiology and function are analyzed and applied to understand the normal body movement necessary for performing functional tasks. Through laboratory experiences, students will perform evaluation procedures of proper body mechanics, posture, muscle strength, endurance, and joint range motion. Clinical reasoning skills will be used to analyze various cases that present movement dysfunction. The analysis and evaluation of movements are made in the context of an activity by observing performance in natural environments, considering factors that facilitate or hinder occupational performance.

TEOC 6010 - Principles to Inform Occupational Therapy Practice. Three (3) credits. Co-requisite: TEOC 6001
This course will introduce students to principles related to the clinical practice of occupational therapy. The concepts of health, well-being, quality of life and occupation will be presented as the foundation for

occupational therapy services and as a determinant of health. Federal and local legislation that supports occupational therapy interventions will be discussed. Students will develop skills in the analysis of activities, tasks, and occupations to promote participation in life. Evaluation and intervention for individuals, groups, and populations will be introduced. Students will analyse the interaction of performance skills, patterns, and contextual factors within occupational participation at community level. The use of the teaching and learning process, health literacy, and groups to promote occupational participation will be covered and evidence integrated. Laboratory experiences will be provided. This course will be offered utilizing a face-to-face teaching modality.

TEOC 6101 - Occupational Dysfunction I. Three (3) credits. Pre-requisites: TEOC 6001, TEOC 6007
This is the first of a two-course sequence, designed to develop in the students the knowledge, skills and attitudes related to a variety of biopsychosocial conditions and social situations that affect occupations and occupational performance. The analysis of the impact of these disorders and conditions in the occupational performance areas, performance skills and patterns, contexts and environment and lifestyle are emphasized throughout the courses. Sociocultural variables and their effect of these disorders and conditions on the individual, the family and the society are included in the framework of this analysis. This course presents a variety of health-related concepts and some diagnostic classification systems with emphasis on mental health disorders in elderly, adults, adolescents, and children. Students are also exposed to a variety of laboratory experiences.

TEOC 6102 - Occupational Dysfunction II. Three (3) credits. Pre-requisites: TEOC 6006, TEOC 6009, TEOC 6101. Co-requisites: TEOC 6203, TEOC 6301
This is the second part of a two-course sequence, designed to develop in the students the knowledge, skills and attitudes necessary to understand a variety of developmental and physical disabilities in adults, children and adolescents that affect occupations and occupational performance. The analysis of the impact of these conditions on the individual abilities to engage in occupation in order to participate in the appropriate context or contexts is emphasized throughout the course. The effect of these conditions on the individual, the family and the society are included in the framework of this analysis. Laboratory experiences are provided.

TEOC 6201 - Theory and Practice of Occupational Therapy in Psychosocial Dysfunction I. Three (3) credits. Pre-requisites: TEOC 6101, TEOC 6501
This is the first part of a two-course sequence designed to discuss the theory and application of the OT process to a variety of human situations and conditions that result in psychosocial and cognitive dysfunction which affect occupational performance in adolescents, adults and older adults. It will enable the students to understand the distinctiveness of the mental health field. Clinical reasoning skills and evidence-based practice will be used to guide decisions related to the selection of an appropriate model of practice or frame of reference and to perform the occupational therapy process. Practical experiences will be provided using different screenings and assessment methods. The documentation process and reimbursement sources in this practice area are also discussed. The course will integrate ethics and contextual factors of health and human service delivery systems.

TEOC 6202 - Theory and Practice of Occupational Therapy in Psychosocial Dysfunction II. Four (4) credits. Pre-requisite: TEOC 6201. Co-requisite: TEOC 6502
This is the second of two courses designed to discuss the theory and application of the occupational therapy process to a variety of human situations and conditions that result primarily in psychosocial or cognitive dysfunction and affect occupational performance in adolescents, adults and older adults. It will enable the students to further understand the distinctiveness of the mental health field. Models of practice and frames of reference are presented in this course, emphasizing their value as clinical reasoning and scientific evidence guides for the intervention in the psychosocial area. The application of the Occupational Therapy Process to various age groups and psychosocial problems is included. Psychosocial interventions within communities

and populations as well as specialized roles within this practice area are also analyzed. Students are also exposed to a variety of laboratory experiences. Documentation skills and ethical reasoning are integrated throughout the course.

TEOC 6203 - Theory and Practice of Occupational Therapy in Physical Dysfunction I. Three (3) credits. Pre-requisites: TEOC 6006, TEOC 6009, TEOC 6501. Co-requisite: TEOC 6102
This is the first part of a two-course sequence designed to develop in the students the knowledge, skills, and attitudes necessary to practice occupational therapy with persons, groups, and populations having occupational dysfunction as a result of physical disabilities, with emphasis in adults and older adults. The first units of this course are designed to provide an overview of the physical disabilities field, the conceptual basis of practice, including the disability experience from an individual and family perspective. Clinical reasoning skills, evidence-based practice, and ethics will guide decisions related to the selection of an appropriate model of practice or frame of reference, to perform occupation-based evaluations using a top down and a client centered approach. Through laboratory experiences students will administer a variety of screening and assessment instruments used in occupational therapy.

TEOC 6204 - Theory and Practice of Occupational Therapy in Physical Dysfunction II. Four (4) credits. Pre-requisite: TEOC 6203. Co-requisite: TEOC 6502
This is the second of two courses designed to develop in the students the knowledge, skills and attitudes necessary to practice occupational therapy with persons, groups, and populations having an occupational dysfunction as a result of physical disabilities. Emphasis is given to adults and older adults. Clinical reasoning skills and evidence-based practice will be used to guide decisions related to the selection of a model of practice or frame of reference and to design an occupation-based intervention plan. Furthermore, it includes the selection of the appropriate intervention methods focused on promotion, compensation, adaptation, and prevention of dysfunction resulting from specific physical disabilities. Topics related to documentation, reimbursement sources, outcome measures, ethics as well as trends and issues in this practice area are also discussed. The course includes laboratory experiences and visits to clinical scenarios.

TEOC 6205 - Context and Management of Occupational Therapy Service. Three (3) credits. Pre-requisite: TEOC 6501.
Course designed to foster a critical analysis of the impact of contextual factors and trends on healthcare, education, community, political and social systems and models of service delivery on the occupational therapy practice. The legal and political bases of these systems and its influence on service delivery are presented. The systems and structures that create legislation and regulations are also discussed. The management of occupational therapy services is presented from the perspective of the contexts of service delivery. The development of skills and strategies for applying principles of management are emphasized. The importance of leadership skills and the role and responsibility of the practitioners as advocates and change agents in a constantly evolving environment are also discussed. Laboratories, and case analyses are the main instructional strategies used.

TEOC 6303 – Special Topics in Occupational Therapy: Promoting children and Youth's Participation in the Occupation of Education. Three (3) credits. Pre-requisite: TEOC 6301. Co-requisite: TEOC 6302
This special topic course delves into occupational therapy domain areas essential to enhance children and youth participation in the educational context. Emphasis is given to the development of skills to evaluate the learning context and child's performance within it. Discussed interventions include assistive technology to enhance the teaching-learning process, strategies to promote mental health in educational contexts, and ways to contribute to ease transitions within the educational pathway. The critical importance of collaborative work with school personnel and the role of occupational therapists as a consultant within the school context are focused during experiences embedded throughout the course. Students are encouraged to understand and envision the participation of occupational therapy as part of a Multi-Tiered System of

Support (MTSS). The course incorporates various laboratory and experiential learning strategies that depict its practical emphasis. This is the second of two courses designed to develop in the

TEOC 6301 - Theory and Practice of Occupational Therapy in Pediatrics I. Three (3) credits. Pre-requisites: TEOC 6002, TEOC 6006, TEOC 6007, TEOC 6501
This is the first of a two courses focused on occupational therapy with pediatric populations. Students will acquire the knowledge, skills, and attitudes expected from an entry level professional. Foundations of occupational therapy for infant, children, youth, and their families under a client centered approach, and application of evidence-based practice principles and clinical reasoning skills are emphasized. Legislation, reimbursement sources, documentation, role of the occupational therapy practitioners, and contexts of service delivery are also studied. The course will emphasize a family centered approach; understanding of the infant development as a foundation for the continuous refinement of motor, cognitive and social skills; the development of evaluation, and clinical observation skills; applications of the motor skills acquisition frame of reference; and the role of occupational therapy with children with handwriting difficulties. The course includes laboratory experiences.

TEOC 6302 - Theory and Practice of Occupational Therapy in Pediatrics II. Four (4) credits. Pre-requisite: TEOC 6301. Co-requisite: TEOC 6502
This is the second of two-courses focused on occupational therapy practice with pediatric populations. Clinical reasoning skills and evidence-based practice will be used to guide decisions related to the selection of an appropriate model of practice to work with children and adolescents with diverse needs, including: sensory processing, postural and mobility, feeding, visual-perceptual, and behavioral difficulties, as well as with youth transitioning to adulthood. Occupation-based evaluation, treatment planning and interventions will be emphasized throughout the course content, case discussions, documentation exercises and assignments. The course includes laboratory experiences.

TEOC 6401 - Evidence Based Practice in Occupational Therapy I. Three and a half (3.5) credits. Pre-requisite: TEOC 6001, TEOC 6008
This course is the first of a three-course sequence. The emphasis of these courses is on developing skills to make clinical intervention decisions guided by scientific findings. In this course the student is exposed to conceptual and practical experiences related to the process of analyzing a variety of questions using an evidence- based practice model and research principles. Emphasis is given to the interpretation and analysis of quantitative data, research designs, and research findings. Students are exposed to the use of data bases for literature search. Emphasis is given to the, to identify the best evidence to support clinical reasoning and decision-making in occupational therapy. Additionally, students will initiate the literature review of the research project they will continue developing as part of the EBP course sequence. The course includes laboratory experiences.

TEOC 6402 - Evidence Based Practice in Occupational Therapy II. Two (2) credits. Pre-requisite: TEOC 6401
This is the second of a three-course sequence, designed to guide the student in the development of skills to make clinical intervention decisions guided by scientific findings and in the development of a scholarly research proposal. Emphasis is given to the appraisal of qualitative evidence, professional literature search and critical interpretation and analysis of scientific findings to support clinical intervention in occupational therapy. Evidence and data provided by qualitative research is also analyzed. Students will complete a mentor guided scholarly research proposal to advance knowledge that can be translated to an improved professional practice. Additionally, concepts of validity and reliability are discussed, and students get the skills to evaluate the psychometric properties of evaluation tools commonly used in occupational therapy. The course also provides laboratory experiences.

TEOC 6403 - Evidence Based Practice in Occupational Therapy III. Three (3) credits. Pre-requisite: TEOC 6402. Co-requisites: TEOC 6202, TEOC 6204, TEOC 6302, TEOC 6502

This is the third of a three-course sequence designed to complete the scholarly research proposal and/or initiate the implementation of an evidence-based practice/research project aligned with current This is the third of a three-course sequence designed to complete the scholarly research proposal and/or initiate the implementation of an evidence-based practice/research project aligned with current Occupational Therapy Program research priorities. Further analysis of the body of evidence that supports occupational therapy, as well as multiple reading and composition skills will be emphasized throughout the course. A selection of workshops related to the use of data analysis software, dissemination and publication of research findings, and basic grant writing skills will be conducted. Students will write a comprehensive research report and conduct oral presentations of the scholarly research proposal and final research project to a variety of audiences. Students will receive direct supervision and guidance from a faculty mentor during all the phases of the research proposal project, including implementation, and dissemination.

TEOC 6501 - Fieldwork Experience Level I Part A. Two (2) credits. Pre-requisites: First Year courses, except TEOC 6005. Co-requisites: TEOC 6101 and 6401.

This Level I Fieldwork course will provide the students with a supervised experience in which they will have the opportunity to participate and provide preventive services in a variety of community scenarios. Service learning is stressed throughout the course. Previously selected community settings will provide for the development of skills related to the implementation of the occupational therapy process, with emphasis in the occupational health-dysfunction continuum in a diversity of conditions, situations and age groups. Throughout the experience the students will apply interventions according to the occupational therapy domain and process and based on scientific evidence to the selected community.

TEOC 6502 - Fieldwork Experience Level I Part B. Two (2) credits. Pre-requisites: Courses of the First Year of Study and courses of the First Semester of the Second Year of Study. Co-requisites: Courses of the Second Semester of the Second Year of Study.

This course provides the student a variety of Level I fieldwork experiences that enhance their understanding of how clients' occupational performance needs are affected by health issues and their contexts. The student participates in directed observations and in selected aspects of the occupational therapy process, with emphasis in evaluation. They will apply knowledge of the scope of the occupational therapy services considering the context of the fieldwork scenario. Learning experiences are systematic and structured to integrate current knowledge with clinical reasoning and evidence-based practice and to facilitate inter-connection between fieldwork experiences and didactic coursework. The student will demonstrate professional and ethical behaviors. Supervision is provided by qualified personnel at the fieldwork site and by the educational program. An integrative seminar is included as part of the fieldwork experience.

TEOC 6503 - Fieldwork Experience Level II. Twelve (12) credits. Pre-requisites: All the Academic Program courses except TEOC 6403

This Fieldwork Experience is designed to give students the opportunity to work with individuals and groups across all ages to promote occupational performance, quality of life, health, and well-being. Clinical reasoning skills and evidence-based practice will be applied throughout the Occupational Therapy process using a client-centered approach. Students will use a variety of occupations in evaluation and for intervention in traditional and non-traditional service delivery scenarios. It offers students the opportunity to assume a variety of roles congruent with those of entry-level occupational therapists. It enables them to work with family, caregivers and other team members. They will apply the ethical principles related to the profession and demonstrate professional behaviors. Qualified clinical educators provide student’s direct supervision. Grading System Passed (P), Fail (F) since July 2008.

PROGRAM SHARED BY THE SCHOOL OF MEDICINE AND THE SCHOOL OF HEALTH PROFESSIONS (JOINT DEGREE PROGRAM) COURSE DESCRIPTIONS GRADUATE COURSES

INCL 6005 - Introduction to Clinical and Translational Research. One (1) credit.
The course will introduce students to the essential aspects of clinical research. The student will gain the basic concepts of Clinical Research. An overview of the types of clinical studies will be presented. Students will be exposed to the introduction of the development of the research question, the protocol design, the use of references database, and the use of clinical databases by the use of assigned exercises. Management, ethics, and regulatory aspects as applies to the topics discussed will be addressed briefly.

INCL 6006 - Introduction to Health Services Research. One (1) credit.
This course presents the key principles, methodologies, and processes pertaining to health services research. It examines the multidisciplinary nature of health services research, through the discussion of studies from the research literature. It presents an overall picture of the area covered by health services research (utilization, costs, quality, accessibility, organization, financing, and outcomes of health care services) and the use of research outcomes for public policy analysis. This course is offered through the online modality. Grading System: Passed (P), Not Passed (NP)

INCL 6007 - Gender Considerations in Clinical and Translational Research. One (1) credit. Pre-requisite: INCL 6005.
Through lectures, seminars, group discussions and student presentations this course will give students the opportunity to discuss differences in the composition of diseases between men and women. Topics such as: Underrepresentation of Women in Clinical Trials, Gender-Related Analysis Definition, Gender Framework for Health Research, Gender Variables that must be taken into Account in Research, NIH Guidelines on Including Women and Minorities in Clinical Trials, and How to Incorporate Women in Studies, will also be presented. Students will be able to assess the status of research on gender differences and it is expected that they prepare a critical analysis on gender-related clinical research.

INCL 6008 - Health Disparities: A Translational Research Approach. Two (2) credits.
This course has multidisciplinary and interdisciplinary focus to address translational research in health disparities. The course will define health disparities taking into consideration the historical context, determinants and theoretical frameworks. It will cover the different components of translational research and its relevance in health disparities, and the role of community engagement as a strategy in translating health research to communities in an effort to reduce health disparities. Students will be able to apply measurements, models and evaluation methods in addressing health disparities, as well as understand the importance of translating and disseminating scientific knowledge into policy and practice in health disparities research. Overall, the course will provide an experimental opportunity through a practical experience that will help students apply translational research to address a health disparity. This course will be taught via online modality.

INCL 6009 - Scientific Communication in Clinical and Translational Research. Two (2) credits.
Through distance learning education modality this course will provide knowledge and skills to effectively communicate research outcomes in medicine and healthcare using diverse communication media (from traditional interviews, radio and television, peer-reviewed articles, to newer uses of technology including podcasts and messaging through internet outlets) to varied audiences, such as: colleagues in medicine and health care, lay consumers, elected officials and advocacy groups in the health-and healthcare-related policy. Current issues such as: healthcare reform, biomedical informatics, and clinical effectiveness research will be used as the framework for course discussions, among others. The concept and role of technology transfer, intellectual property, and the patent process as they relate to clinical and translational research, as well as the communication of research in medicine and healthcare will also be discussed.

INCL 6016 - Application of Informatics in Research. One (1) credit.
The course focuses on three central knowledge areas: principles and applications of informatics in clinical research, database management systems and web resources, and managing the integration of informatics in clinical research. This course provides informatics tools necessary for the practice of clinical research. The focus is on current research in informatics, data base design, decision support systems, and appropriate use of computer technology.

INCL 6017 - Introduction to Biomedical Informatics. One (1) credit. Pre-requisite: INCL 6016.
This course is designed to train students in Biomedical Informatics, specifically in the acquisition, use, and storage of information in healthcare and biomedicine practice and research. The course will cover the main applications of bioinformation technology including: electronic health records, personal health records, information and data retrieval, and best practices. In addition, it will provide students the opportunity to engage with current events in the field of bioinformatics related to their own interests in clinical and translational research. Information technology will be studied from different perspectives, such as: medicine, computer science, public health and patients/consumers.

INCL 6025 - Bioethics and Regulatory Issues in Clinical and Translational Research. Two (2) credits.
This course provides a spectrum of trends with a broad base on the ethical, legal and regulatory aspects that govern the practice of clinical research. These aspects will be discussed based on the actual definitions and situations that will provide the participants with perspectives of the research process in its multiple manifestations. The course will discuss the historic framework that supports the ethical, legal and regulatory aspects of research. The development, enactment, and enforcement of all applicable principles, regulations and laws that govern the research enterprise will be discussed, interpreted, and analyzed. The course will emphasize principle-based ethics. This course is offered through the online modality.

INCL 6041 - Biostatistic in Clinical and Translational Research I. Two (2) credits.
This course will give the opportunity to applied descriptive and inferential statistics. It is intended for students without previous statistical training. Topics include elementary probability theory, an introduction to statistical distributions, point and interval estimation, and hypothesis testing. Basic data analysis techniques will be introduced using statistical programs for personal computers. The material will be covered using the following instructional strategies: lectures, computer laboratory demonstrations, and practices.

INCL 6042 - Biostatistic in Clinical and Translational Research II. Two (2) credits. Pre-requisite: INCL 6041.
This course is a continuation of Biostatistics in Clinical Research I. Through conferences and group discussions, the student will refine the knowledge and skills in biostatistical inference and methods for clinical research. This course focuses on the study of more than two groups via analysis of variance and nonparametric tests. Classical regression and correlation analysis, logistic regression, ordinal logistic regression, and nominal logistic regression are also discussed. It also includes an introduction to survival analysis. A statistical computer program, STATA TM will be used for data entry, graphical, and statistical analysis.

INCL 6045 - Introduction to Bioinformatics and Medical Genomics. One (1) credit. Pre-requisites: INCL 6016, INCL 6041.
This course is designed to provide an overview and understanding of important topics in genomic medicine and its clinical applications at an introductory level. Students will be able to learn about problems involved in the analysis of biological data such as DNA/protein sequences, genomic data, gene expression data, and proteomics data and how to address problems in clinical research with these new technologies. The course is intended to provide a review of basic molecular biology, an introduction to the Central Dogma of Molecular Biology, a short review of genetics and its applications to populations. Use of molecular biology and genomic databases for biological research, through the internet using bioinformatics will be a part of the course. A basic overview of genomics, single nucleotide polymorphisms, DNA, RNA and protein chip arrays applied to

clinical research, pharmacogenomics, and proteome data analysis will be given. Ethical issues in clinical research involving genomics will be discussed. The course is intended to be flexible and adaptable to students' needs.

INCL 6047 - Epidemiology in Clinical and Translational Research. Three (3) credits.
This introductory course will discuss the basic concepts, principles and methods of epidemiologic research focusing on the application of these concepts in clinical and translational research practice. Emphasis will be given to calculation and interpretation of quantitative measures, discussion of basic study designs, sources of bias, and causal inference. Epidemiologic studies of the natural history of illness, evaluation of diagnostic and screening tests, and randomized and non-randomized studies of therapeutic strategies will also be discussed. Strategies to minimize errors in study design, data collection procedures, and data analysis including the evaluation and adjustment of confounded observations using multivariable analyses will be discussed. In addition, we will apply these fundamental concepts through the critical appraisal of peer-reviewed publications in clinical research. This course will be taught as a combination of distance learning activities and face-to-face interactions.

INCL 6055 - Clinical Trials. One (1) credit. Pre-requisites: INCL 6041, INCL 6047.
This course is an introduction to the subject of clinical trials. It is designed for individuals interested in the scientific, policy, and management aspects of clinical research. through lectures and group discussions the clinical trials, protocol document, study design, treatment allocation, randomization and stratification, quality control, sample size requirements, stopping of trials and sequential design, patient consent, and interpretation of results, will be covered. Students will design a clinical investigation in their own field of interest, write a concept sheet for it, and write reviews critiquing recent published medical literature.

INCL 6056 - Clinical and Translational Research Protocol Development. Two (2) credits. Pre-requisites: INCL 6041, INCL 6047.
Through distance education modality, this course provides students the opportunity to acquire and apply knowledge and skills in the development of a clinical and translational research proposal using as a guide the National Institutes of Health (NIH) Grant Application (PHS 398), in teamwork with their mentor. The course will deal with topics such as: specific aims, hypothesis, research plan, research approach and budget, among others. In addition, this course will cover the significance and innovation in research, recruitment of participants, timeline, investigators, and research environments. Among the instructional strategies that will be used are: lectures, discussion boards and peer review. Students conclude the course by presenting a proposal ready to be submitted to the Institutional review Board (IRB).

INCL 6075 - Bioanalytical Methods in Clinical and Translational Research. Two (2) credits. Pre-requisites: INCL 6005, INCL 6016, INCL 6041.
This online course presents the evolution and application of the bioanalytical methods in clinical and translational research. Emphasis will be given to the laboratory safety, sample handling & ethics, bio-repository, protein analysis (UV-VIS spectroscopy, separation techniques, electrophoresis, gas chromatography, high performance liquid chromatography), flow cytometry, molecular biology techniques (DNA and RNA extraction, PCR, Nucleic Acid Hybridization and microarrays) and epigenetics, among others. The student will also be exposed to hands-on laboratory experience related to protein analysis. Instructional strategies include: lectures, group discussions, videoconference, laboratory demonstrations, interactive videos, and independent studies, among others.

INCL 6085 - New Frontiers in Clinical and Translational Research. One (1) credit.
This is a seminar series for the dissemination of the latest issues in Clinical Research. Distinguished Clinical Researchers will be invited to present their work. The speakers will provide some of their publications that will be required reading for the students. This course enhances students' skills in the interpretation and

critically appraisal of research articles. In addition, invited researchers interact with the scholars, discussing the necessary skills and the successful strategies that work to face the challenges of a career as a clinical and translational researcher. Grading System: Passed (P), Not Passed (NP).

INCL 6095 - Clinical and Translational Research. Six (6) credits. Pre-requisites: INCL 6009, INCL 6056.
This course is designed for the Postdoctoral Clinical Research student to apply his/her research skills in order to perform and complete his/her approved research project. The student will be able to apply the scientific skills required for the execution of his/her research project. They will also apply their writing skills as required for manuscript preparation and submission for publication in a peer reviewed journal. In addition, they will submit an abstract and present their findings in a national or international scientific forum. Grading System: Passed (P), Not Passed (NP).

Faculty

ALBINO RODRÍGUEZ, ELINETTE – *Assistant Professor*, PhD, 2014, Ponce Health Sciences University, Puerto Rico.

ALEMÁN-BATISTA, ADA MILDRED - *Associate Professor; PsyD*, 2003, Ponce Health Sciences University, PR.

CABALLERO-COLÓN, ELINA – *Associate Professor*; MC/SC, 2008, University of Phoenix - Puerto Rico Campus.

CAMACHO-MARTÍNEZ, ALMA J. - *Professor*; EdD, 2015, Inter American University of Puerto Rico.

CARLO-COLÓN, MITZARIE - *Professor*; AuD, 2006, University of South Florida; PhD, 2008, University of South Florida.

CARLO-MIRABAL, EDNA J. - *Professor*; ClinScD, 2017, Rocky Mountain University of Health Professions.

COLÓN-RÁMIREZ, WANDA I. - *Professor*; PhD, 2008, Nova South Eastern University.

CRUZ-GÓMEZ, CYNTHIA - *Professor*; DPT, 2015, AT Still University

CRUZ-RIVERA, ARNALDO - *Professor*; PhD, 2008, Carlos Albizu University.

CRUZ-RIVERA, GLORIANA – *Adjunct Faculty*; ClinScD, Rocky Mountain University of Health Professions

DÁVILA-MARTÍNEZ, ROBERTO - *Professor*; EdD, 1986, Inter American University of Puerto Rico.

DÍAZ-BOULON ALICIA Z. – *Assistant Professor***;** EdD, 2018, Inter American University of Puerto Rico.

FIGUEROA-BERRIOS, ZAIRA E. – Assistant Professor; DMD, 2003, University of Puerto Rico - Medical Sciences Campus.

FONT-RIVERA, ANA J. –*Professor*; PhD, 2001, Nova Southeastern University, FL, US

FUENTES-VÉLEZ, SOL SIREE - *Assistant Professor*; MPH, 2008, University of Puerto Rico - Medical Sciences Campus.

GARCÍA-GARCÍA, RUBÉN - *Professor*; PhD, 1988, University of Puerto Rico - Medical Sciences Campus.

LINARES-ORAMA, NICOLÁS - *Professor*; PhD, 1975, University of Illinois.

LÓPEZ-ORTIZ, WILMA J. - *Professor*; EdD, 2014, University of Puerto Rico – Rio Piedras Campus.

LÓPEZ-RIVERA, YADIRIS – *Assistant Professor;* DrPH, 2018, University of Puerto Rico - Medical Sciences Campus.

LUGO-CANALES, ALEXIE M. – *Assistant Professor*, PhD, 2018, Ana G. Mendez University-Cupey Campus.

LUGO-VÉLEZ, WANDA – *Associate Professor;* AuD, 2012, Salus University of Pennsylvania.

MARTÍNEZ-RIVERA, WILITZA – Assistance Professor, DPT, 2012, A.T. Still University – Arizona.

MARTÍNEZ-RODRÍGUEZ, MELWEEN I. - *Professor;* DVM, 1991, Tuskegee University.

MARTÍNEZ-VÁZQUEZ, MIGDALIA - *Professor;* EdD, 2000, University of Puerto Rico - Rio Piedras Campus.

MEDINA-NATER, IVETTE M. - *Assistant Professor*; MBA, 2004, University of Phoenix.

MELÉNDEZ-SOSTRE, JUAN - *Professor*; EdD 2008, Inter American University - Puerto Rico, Metropolitan Campus.

MENDOZA-KEPPIS, ZULLYBEL- *Assistant Professor* , PsyD , Universidad Carlos Albizu

MULERO-PORTELA, ANA L. - *Professor*; PhD, 2000, Texas Woman´s University.

OLIVIERI-VILLAFAÑE, ZULMA - *Professor*, MS, 1997, University of Puerto Rico - Medical Sciences Campus.

ORELLANO-COLÓN, ELSA M. –*Professor*; PhD, 2009, Nova South Eastern University.

ORTIZ-REYES, CARLOS A. - *Associate Professor*; MBA, 2000, University of Phoenix.

OWEN-SANOGUET, GRACE A. - *Professor*; ScD, 1997, Boston University.

PACHECO-RODRÍGUEZ, MIRNA L. – Associate *Professor*; EdD, 2014, Inter American University – Puerto Rico.

PAGÁN-VILÁ, AMARILIS - Associate Professor, MA, 1991, Cincinnati University.

PAGÁN LISBOA, JOSSIAN J.- Assistant Professor, DrPH, 2022, University of Puerto Rico, Medical Sciences Campus

PAMIAS VELÁZQUEZ, KRISTIAN- Adjunct Faculty, EdD, AT Still University

PARÉS CRUZ, HAYMÉE M. - Adjunt Faculty; MS, 2002, University of Puerto Rico - Mayaguez Campus

PÉREZ-COLÓN, BRENDA - *Instructor*; MS, 2000, University of Puerto Rico - Medical Sciences Campus.

RAMOS-PRATTS, KEYLA - *Assistant Professor, PhD, 2013, University of Puerto Rico- Medical Sciences Campus.*

RIVAS-VIDAL, AMARILIS - *Assistant Professor; EdD, 2021*, Ana G. Méndez University.

RIVERA COSME, MARIE C. – *Adjunct Faculty*, MA, OTL, 2015, Metropolitan University (UMET) - Cupey

RIVERA-RIVERA, HERIBERTO – *Associate Professor*; EdD, 2009, Inter American University.

RIVERA-VELÁZQUEZ, ELIZABETH - *Professor*; DVM, 1992, Tuskegee University.

RODRÍGUEZ-CALDERÓN, BLANCA I. - *Professor*; EdD, 2013, Capella University – Minnesota.

RODRÍGUEZ-QUILES, ANA - *Instructor*, MPHG, OTR/L, 2000, University of Puerto Rico – Medical Sciences Campus

RODRÍGUEZ-SANTOS, ENID - *Counselor II*, MEd, 2001, University of Puerto Rico - Río Piedras Campus.

RODRÍGUEZ-TORRES, JESSICA - *Professor*; DPT, 2003, University of Central Arkansas.

ROMÁN-OYOLA, ROSA – *Associate Professor*; PhD, 2012, Virginia Commonwealth University.

ROMÁN-RODRÍGUEZ, ERICK *– Adjunct Faculty; MPH, 2023, University of Puerto Rico – Medical Sciences Campus*

ROSADO-SANTIAGO, EDGARDO L. - *Associate Professor*; MPH, 2008, University of Puerto Rico - Medical Sciences Campus.

ROSARIO-HERNÁNDEZ, RUTH - *Professor*; MS, 2000, University of Puerto Rico - Medical Sciences Campus.

RUIZ-SÁNCHEZ, LUZ A. – *Associate Professor*; EdD, 2016, University of Puerto Rico – Rio Piedras Campus.

SAN MARTÍN-FERNÁNDEZ, MARÍA T. - *Professor*; EdD, 2022, Ana G. Méndez University.

SANTIAGO-DE SNYDER, SOAMI - *Professor*; PhD, 1993, University of Pittsburg.

SANTIAGO-RAMOS, LUIS J. - *Associate Professor*; MPH, 2002, University of Puerto Rico - Medical Sciences Campus.

SANTOS-NIEVES, SANDRA I. - *Professor*; DBA, 2016, Turabo University.

SEGARRA-VÁZQUEZ, BÁRBARA - *Professor*; DHS, 2010, Nova Southeastern University.

SERRANO-TORRES, LUIS A. - *Professor;* MD., 1981, Columbia Presbyterian Medical Center- New York.

SILVA-CINTRÓN, SANDRA - *Professor*; DBA, 2010, Turabo University.

SOTOMAYOR-DELESTRE, JONATHAN – *Assistant Professor,* Ed.D, 2021, Nova Southeastern University..

SOTO-VÁZQUEZ, LOURDES E. - *Professor*; EdD, 1991, University of Puerto Rico - Río Piedras Campus.

SOTO-VEGA, ALEX J. - *Assistant Professor;* DHSc, 2022, Nova Southeastern University, Florida

VÉLEZ-BARRIOS, GLORIA M. - *Professor*; PhD, 2012, Universidad de Valencia.

VÉLEZ-JIMÉNEZ, LYPZIA M. – *Associate Professor*; EdD, 2015, University of Puerto Rico – Río Piedras Campus.

VIENTÓS-VALLE, JOSE A. - *Professor*; DVM 1979, Kansas State University.

VINCENTY-LUYANDO, MARISOL - *Professor*; PhD, 2000, University of Connecticut.

SCHOOL OF NURSING

MISSION AND GOALS

The mission of the School of Nursing is to prepare highly qualified nursing professionals leaders in service, education and research to work in an interdisciplinary manner within a changing and culturally diverse society.

The main goals of the School of Nursing are:

- Prepare nurse generalists at the baccalaureate level with the knowledge, ethical decision-making, critical thinking, technical and technological skills, and attitudes necessary to practice as professional nurses, and to assume a leadership role when offering direct competent care that is evidence-based, collaborative, interdisciplinary and culturally congruent with individuals, groups, and populations in a variety of settings, including primary, secondary, and tertiary health care levels.
- Prepare master's level nurses with knowledge and skills in evidence-based practice and research to improve health care and advance education, administration, and practice that may assume leadership roles as teachers in nursing education programs, administrators of nursing services, and specialists.
- Prepare advanced-practice nurse anesthesia professionals at the doctoral level with the knowledge, skills, and attitudes required for safe anesthesia delivery with a solid foundation in evidence-based practice, critical thinking, quality improvement, systems leadership, and interprofessional skills.
- Prepare nurse scientists at a doctorate level to conduct research in nursing and contribute to the advancement of nursing science and improvement of practice.
- Provide continuing education activities to enhance knowledge and lifelong learning among professional nurses and other health professionals.
- Promote the development of nursing professionals for the improvement of health care at the national and international levels.

ORGANIZATION AND ADMINISTRATION

Founded in 1940, the School of Nursing began as one of the programs of the School of Tropical Medicine, later becoming part of the Department of Preventive Medicine and of the School of Public Health. In 1975, when the Medical Sciences Campus was reorganized, the School became a unit of the School of Health Professions, under the direction of an Associate Dean. On July 1, 1995, it became an autonomous deanship and later a School within the Medical Sciences Campus.

The Dean is the chief executive officer of the School. There is an Associate Dean for Academic Affairs, an Assistant Dean for Student Affairs, and an Assistant Dean for Research, and a Director of Administrative Affairs. The School offers a Bachelor of Science in Nursing program. Also offers the following graduate programs: Master of Science in Nursing, Doctor of Nursing Practice with specialty in Anesthesia and a Doctor of Philosophy in Nursing.

LOCATION AND FACILITIES

The School of Nursing occupies two buildings at the Medical Sciences Campus with classrooms, an amphitheater, a Center for Development of Skills of Nursing, a Center of Learning and Technology Integration, and a Center for Nursing Research. The Medical Sciences Campus has established agreements with several

government agencies, communities, homes for the elderly, the Veterans Administration Hospital, and private agencies for the clinical practice of students. School of Nursing address is:

Medical Sciences Campus
School of Nursing
PO Box 365067
San Juan, Puerto Rico 00936-5067

ACCREDITATION

Commission on Collegiate Nursing Education (CCNE)

The Bachelor of Science in Nursing program / Master of Science in Nursing program and Master of Science in Nursing with specialty in Anesthesia program at Medical Sciences Campus School of Nursing is accredited by the Commission on Collegiate Nursing Education (http://www.ccneaccreditation.org).

The Doctor of Nursing Practice with specialty in Anesthesia program at Medical Sciences Campus School of Nursing is pursuing initial accreditation by the Commission on Collegiate Nursing Education (http://www.ccneaccreditation.org). Applying for accreditation does not guarantee that accreditation will be granted.

Council on Accreditation of Nurse Anesthesia Educational Programs (COA)

The Council on Accreditation of Nurse Anesthesia Educational Programs (COA) also accredits the Master of Science in Nursing with specialty in Anesthesia and the Doctor in Nursing Practice with specialty in Anesthesia.

Council on Accreditation of Nurse Anesthesia Educational Programs
10275 W. Higgins Rd., Suite 906
Rosemont, IL 60018-5603
Tel. 224-275-9130
http://www.coacrna.org/

ACADEMIC PROGRAMS

BACHELOR OF SCIENCE IN NURSING (BSN) PROGRAM

The purpose of the BSN program is to prepare nurse generalists with the knowledge, skills, and attitudes necessary for professional nursing practice in a variety of health settings in primary, secondary, and tertiary levels of care. The curriculum includes courses in general education, basic sciences, and nursing. During the first two years, students will take general and bio- psychosocial pre-requisite courses at an accredited institution of higher education. They will complete the remaining two years of nursing course requisites at the School of Nursing.

The program is organized in four academic years. It consists of 127 semester credit hours distributed as follows:

- 39 credit – hours in general education, including a course in statistics
- 26 credit – hours in bio – psychosocial sciences
- 62 credit – hours in nursing sciences

During the third and fourth year of studies, students are introduced to both the theoretical and clinical foundations of nursing to prepare them for nursing interventions with clients at all stages of growth and development, moving along the wellness-illness continuum. Nursing interventions are carried out in primary, secondary, and tertiary level health care facilities.

Through the curriculum, students develop the cognitive, psychomotor, and affective skills necessary for nursing, which enable them to practice as nurse generalists at different levels of care within the health system. It also enables them to utilize knowledge from bio-psychosocial areas as frames of reference when making nursing care decisions in interventions with individuals, families, and communities.

Throughout the program, students have the opportunity to select twelve elective credits (including nursing electives) to further enrich their personal and professional growth and development.

Admission Requirements

This program has a guaranteed transfer agreement with the following University of Puerto Rico System units as long as the student complies with the established academic progress criteria: Carolina and Bayamón. The established admission criteria are:

- Approve 65 credits in the courses specified below:

Required courses	**Semester Credit – Hours**
First Year	
Social Science	6
Basic Course in English	6
General Chemistry	8
Mathematics	3
General Biology	8
Elements of Statistical Reasoning	3
Total	**34**

Second Year

Basic Course in Spanish	6
Humanities	6
Anatomy and Physiology	6
Microbiology	4
General Psychology	3
Elective Courses	6
Total	**31**

- Have a minimum general and specific grade point average of 2.50 or higher (the specific index is based on science and mathematics courses).
- Apply to the program before the deadline established by the originating unit and the Medical Sciences Campus.
- Interview with faculty member.

Graduation Requirements

- A minimum grade point average of 2.00 (on a scale of 4.00).
- Approve the program's 127 credit-hours.

BACHELOR OF SCIENCE IN NURSING (BSN) CURRICULUM

Total Semester Credit-Hours: 62

Core Courses: 56 credit hours

ENFE 4116	Introduction to the Nursing Profession	4
ENFE 4118	Health History and Physical Examination	2
ENFE 4125	Pharmacotherapy in Nursing	3
ENFE 4101	Nursing Care of Adult and Elderly I	6
ENFE 4120	Nursing Care of Children and Adolescents	5
ENFE 4075	Introduction to Research and Evidence Based-Practice in Nursing (EBP)	3
ENFE 4102	Nursing Care of Adult and Elderly II	6
ENFE 4119	Nursing Care of Women and Newborn	5
ENFE 4147	Nursing Care of Psychiatry and Mental Health	5
ENFE 4215	Nutritional Needs	3
ENFE 4138	Nursing Care of Family and Community	5
ENFE 4155	Professional Nursing Practice	6
ENFE 4395	Integrated Professional Nursing Concepts	3
Professional Electives		6

MASTER OF SCIENCE IN NURSING (MSN) PROGRAM

The MSN program prepares nurses in advanced knowledge and evidence-based practice with a functional role in higher education in nursing, or in administration of nursing services. The graduate nursing student achieves expert knowledge in the nursing sciences and enhances skills that enable him/her to perform in more complex health circumstances and scenarios where specialized comprehension are required.

The curriculum is organized in two academic years for students attending the day program and three academic years for students attending the evening program. The Program includes the following clinical tracks: Maternal Cycle, Children and Adolescents, Adults, Elderly, Family, Community, Mental Health and Psychiatry, and Critical Care. The functional roles offered are: Teaching of Nursing in Higher Education, and Nursing Services Administration. The Program requires the completion of 46 semester credit-hours and 5 trimester credit-hours for administration role; 40 semester credit-hours and 11 trimester credit-hours for education role.

Admission Requirements

- Bachelor's degree in nursing from a nationally accredited program (CCNE or ACEN (previously NLNAC)).
- Statistics course at the baccalaureate level (3 crs.)
- Current Generalist Nurse License.
- College of Nursing Professionals of Puerto Rico active membership.
- At least one-year experience in a critical care unit to apply for the Critical Care track.
- Obtain a minimum of 55% as a result of the sum of the following criteria to be considered as a candidate for admission:

General academic index	20%
Specific academic index	25%
Interview with graduate program faculty	25%
Critical analysis of a nursing clinical case	25%
Analysis of Curriculum Vitae	5%

Graduation Requirements

- Complete the total number of credits required for the MSN degree.
- All nursing courses must be approved with a minimum grade of B.
- Obtain a general grade point average of 3.00 or higher (on a scale of 4.00).
- Complete all theoretical and clinical activities specified by the program.

Note: The program is under curricular revision. Three new master's degree programs are expected to initiate admissions for August 2027. Please contact the School of Nursing for addition and updated information.

MASTER OF SCIENCE IN NURSING (MSN) CURRICULUM

Total Credit-Hours:
46 Semester C-H + 5 Trimester C-H (Administration Role)
40 Semester C-H + 11 Trimester C-H (Education Role)

Core Courses: 19 semester credit-hours + 5 trimester credit hours

BIOE 6525	Statistical Analysis	5tr
ENFE 6608	Nursing Research	3
ENFE 6615	Research Project	3
ENFE 6626	Nursing Trends in Philosophy, Theory and Practice	4
ENFE 6650	Advanced Physical Assessment	3
ENFE 6651	Advanced Pathophysiology	3
ENFE 6652	Advanced Pharmacology for Nursing	3

Track Courses: 12 semester credit-hours among the following 6 semester credit-hour courses*

ENFE 6602	Nursing Intervention throughout the Maternal Cycle	6
ENFE 6603	Nursing Intervention with Children and Adolescents	6
ENFE 6604	Nursing Intervention with Adult Persons	6
ENFE 6605	Nursing Intervention with Elderly Persons	6
ENFE 6606	Nursing Intervention with the Family Unit	6
ENFE 6607	Nursing Intervention with the Community	6
ENFE 6617*	Nursing Intervention in Mental Health and Psychiatry I	6
ENFE 6618*	Mental Health and Psychiatry Nursing II	6
ENFE 6635*	Nursing Intervention with Critically Ill Persons I	6
ENFE 6636*	Nursing Intervention with Critically Ill Persons II	6

*Students enrolling in ENFE 6617 should enroll in ENFE 6618. Students enrolling in ENFE 6635 should enroll in ENFE 6636.

Role Courses: 9 credit hours among the following courses, according to the selected role

ENFE 6609	Theory in Nursing Services Administration	4
ENFE 6610	Practice in Nursing Services Administration	5
ENFE 6611	Theory of Teaching in Nursing	4
ENFE 6612	Practice of Teaching in Nursing	5

Elective Courses: 6 semester credit hours or 6 trimester credit hours, according to the selected role

ENFE 6616**	Development of Education Programs for Nursing Personnel	3
ENFE 6666**	Trends and Issues in Nursing	3
EDSU 6503***	Principles of Curriculum Design and Developing	3 tr
EDSU 6507***	Educational Evaluation Methods	3 tr
ENFE 6995	Independent Study	1 to 3

** Required for Administration Role *** Required for Education Role

MASTER OF SCIENCE IN NURSING WITH SPECIALTY IN ANESTHESIA

Note: The Master of Science in Nursing with Specialty in Anesthesia program has requested a moratorium status.

The Master of Science in Nursing with specialty in Anesthesia prepares advanced practicing nurses with a high level of scientific background who have the knowledge and skills to evaluate complex nursing anesthesia situations. Graduates should be able to assume the responsibility for arriving at indicated actions and decisions that may have profound effect upon an individual. The competencies of the program are in tune with the mission and philosophy of the University of Puerto Rico (UPR), the Medical Sciences Campus (MSN), and the School of Nursing (SON).

The program curriculum is offered in a 29 months sequence of 67 credits, comprising 18 credits in basic sciences, nine (9) credits of professional aspects courses, and 40 credits of basic and advanced principles in anesthesia courses (specialty). Students should complete 837 didactic hours, a minimum of 72 hours of simulated laboratory, and 2,176 hours of clinical practice, including the 832 hours of Residency I and II. In addition, 33 hours of independent study are required in course ENFE 6900 – Comprehensive Nurse Anesthesia Examination.

Students must comply with the didactic and clinical hours, the clinical experiences, and approve the comprehensive examination to be promoted to the Residency II course in anesthesia. Candidates are committed to sit for the National Certification Examination within 120 days after graduation.

Admission Requirements

- Bachelor's degree in nursing from a national accredited program (ACEN or CCNE).
- A 3.00 GPA in general education courses, sciences and nursing courses.
- Undergraduate Statistics and Chemistry courses (3 credit each one).
- English proficiency as evidenced by TOEFL exam (preferably a general score of 80 or above and a specific reading score of 20 or more).
- Current license as registered nurse.
- Have one-year of professional experience in acute critical care within the previous five years.
- Graduate Record Examination (GRE) over 400 minimum score, 140 revised minimum score or 400 minimum score in Admission Test for Graduate Students (EXADEP).
- Possess current Basic Life Support, Advanced Cardiac Life Support and Pediatric Advanced Life Support certifications.
- Three letters of recommendation. One from each of the following: a) most recent employer; b) a health care professional preferably a CRNA or a licensed physician, and c) of a former professor who can attest to the candidate readiness for graduate education. The letters should reflect an accurate appraisal of clinical skills, experience, and independent decision-making.
- Submit a signed written commitment to sit for the National Certification Examination NCE within 120 days after graduation.
- Computer literacy
- Complete the official application kit and submit the required supporting documentation.
- Obtain a minimum average of 65% as a result of the total of the following criteria:

Personal interview	20%
Minimum academic (general) index	20%
Minimum specific index	25%
EXADEP or GRE	20%
Minimum score required: • EXADEP - 400 • Graduate Record Examination (GRE) o GRE- 400 on both verbal and quantitative reasoning o GRE Revised General Test- 140 on both verbal and quantitative reasoning	
TOEFL	10%
Analysis of Curriculum Vitae	5%

Graduation Requirements

Completion of 67 credits for the degree.

- Approve the courses of the curricular sequence with a minimum grade of B.
- Obtain a General Academic Point Average of 3.0 in the scale of 4.0.
- Completion of the didactic courses and clinical hours as specified by the Program and the National Board of Certification and Recertification Nurse Anesthesia (NBCRNA).
- Comply with the total number of required and preferred anesthesia cases by "patient physical status, special cases, position, anatomical categories, methods of anesthesia, pharmacological agents,

arterial technique, central venous pressure catheter, pulmonary catheter and others" as established by the COA Standards.

- Pass Comprehensive Nurse Anesthesia Examination.

MASTER OF SCIENCE IN NURSING WITH SPECIALTY IN ANESTHESIA CURRICULUM

Total Semester Credit Hours: 67

Basic Science Courses: 18 semester credit hours

ENFE 6678	Human Anatomy and Physiology	3
ENFE 6679	Chemistry, Biochemistry and Physic Principles Related to Anesthesia Practice	3
ENFE 6703	Advanced Pathophysiology I	3
ENFE 6704	Advanced Pathophysiology II	3
ENFE 6701	Advanced Pharmacology I	3
ENFE 6702	Advanced Pharmacology II	3

Professional Aspects: 9 semester credit hours

ENFE 6676	Nursing Theories, Professional and Legal Aspects	3
ENFE 6717	Evidence-Based Practice for Anesthesia	3
ENFE 6795	Evidence-Based Practice Seminar	3

Basic and Advanced Anesthesia Courses: 40 semester credit hours

ENFE 6677	Advanced Health Assessment for Anesthesia	3
ENFE 6705	Basics of Anesthesia	4
ENFE 6721	Advanced Principles of Nurse Anesthesia Practice I	3
ENFE 6722	Advanced Principles of Nurse Anesthesia Practice II	3
ENFE 6723	Advanced Principles of Nurse Anesthesia Practice III	3
ENFE 6725	Obstetric, Neonatal and Pediatrics	3
ENFE 6711	Clinical Practice I	3
ENFE 6712	Clinical Practice II	3
ENFE 6713	Clinical Practice III	3
ENFE 6714	Clinical Practice IV	3
ENFE 6731	Anesthesia Residency I	4
ENFE 6732	Anesthesia Residency II	5
ENFE 6900	Comprehensive Nurse Anesthesia Examination	0

DOCTOR IN NURSING PRACTICE WITH SPECIALTY IN ANESTHESIA (DNP-SA) PROGRAM

The DNP-SA program prepares doctoral-level advanced practicing nursing professionals that are highly qualified to provide the best quality of anesthesia services and deliver anesthesia care based on scientific/research evidence in order to meet the anesthesia services of Puerto Rico and foreign.

The curriculum is designed to award a Doctor of Nursing Practice with Specialty in Anesthesia degree, composed of eighty-seven (87) credits from which ten (10) credits are in research courses, thirteen (13) in DNP core courses, twenty-one (21) credits in basic sciences courses, nineteen (19) credits in anesthesia specialty didactic courses, and twenty-four (24) credits in anesthesia clinical courses distributed in thirty-six (36) consecutive months, including three summers. Students should complete eleven hundred and seventy-

one (1,071) didactic hours which include fifty-four (54) hours of clinical correlational conferences, a minimum of one hundred twenty-six (126) hours of simulated laboratory, sixty (60) hours of independent study and twenty-five hundred and forty-four (2,544) hours of clinical practice, including eleven hundred fifty-two (1,152) hours of residency I & II. The maximum period to meet all didactic and clinical requirements is 54 months or 4.5 years.

Students must comply with the didactic and clinical hours, the clinical experiences, and approve the comprehensive examination to be promoted to the Residency I course in anesthesia. Candidates are committed to sit for the National Certification Examination within 120 days after graduation.

Admission Requirements

The admissions criteria for the DNP-SA program require that the candidates meet the following:

- Possess a Baccalaureate degree in nursing from a nationally accredited program (CCNE, NLN-CNEA or ACEN; *previously NLNAC*).
- A 3.00 Grade Point Average (GPA) in general education courses, sciences and nursing courses.
- Undergraduate Statistics and Chemistry courses with B grade or better (3 credits each).
- English proficiency as evidenced by TOEFL (preferably a general score of 80 or above and a specific reading score of 20 or more) or completing a minimum of bachelor's degree from an educational institution in the continental U.S.
- Demonstrate Spanish proficiency during the interview process.
- Evidence of current license as registered nurse.
- To comply with state laws, all students are required to be licensed in the Commonwealth of Puerto Rico. Reciprocity forms may be obtained from the Puerto Rico State Board of Nursing. The license is required at the beginning of the study program.
- Must have a minimum of one year (two preferred) of full-time work experience (2,080 hours), or its part-time equivalent, as a registered nurse in a critical care setting within the last five years. The applicant must have developed as an independent decision maker capable of using and interpreting advanced monitoring techniques based on knowledge of physiological and pharmacological principles.
- Possess current competency in Basic Life Support (BLS), Advanced Cardiac Life Support (ACLS) and Pediatric Advanced Life Support certifications (PALS).
- Three letters of recommendation using the corresponding recommendation letter format. One from each of the following: a) most recent employer; b) a health care professional preferably a licensed physician or a CRNA, and c) of a teacher that can attest to the academic suitability of the candidate to pursue graduate education. The letters should reflect an accurate appraisal of clinical skills, experience, and independent decision-making. Recommendation letter format is available in the program's webpage.
- Submit a signed written commitment to sit for the National Certification Examination NCE within 120 days after graduation.
- Submission of Curriculum Vitae
- Computer literacy.
- Complete the official application kit and submit the required supporting documentation.
- Obtain a minimum average of 70% as a result of the total of the following criteria:

a.	Personal Interview	25%
b.	Scientific Paper Analysis	10%
c.	Simulation Session	15%

d.	Minimum Specific GPA	25%
e.	Minimum General GPA	20%
f.	Analysis of Curriculum Vitae	5%

Graduation Requirements

Completion of 87 credits for the degree.

- Approve the courses of the curricular sequence with a minimum grade of B.
- Obtain a General Academic Point Average of 3.0 in the scale of 4.0.
- Completion of the didactic courses and clinical hours as specified by the Program and the National Board of Certification and Recertification Nurse Anesthesia (NBCRNA).
- Comply with the total number of required and preferred anesthesia cases by "patient physical status, special cases, position, anatomical categories, methods of anesthesia, pharmacological agents, arterial technique, central venous pressure catheter, pulmonary catheter and others" as established by the COA Standards.
- Maintain full compliance with the policies and procedures of the program.

DOCTOR IN NURSING PRACTICE WITH SPECIALTY IN ANESTHESIA (DNP-SA) CURRICULUM

Total Semester Credit Hours: 87[3]

Basic Sciences Courses: 21 semester credit-hours

ENFE 7130	Advanced Human Anatomy and Physiology (3 cr.)
ENFE 7028	Chemistry, Biochemistry & Physics for Anesthesia (3 cr.)
ENFE 7236	Advanced Health Assessment (3 cr.)
ENFE 7132	Advanced Pathophysiology I (3 cr.)
ENFE 7134	Advanced Pathophysiology II (3 cr.)
ENFE 7131	Advanced Pharmacology for Anesthesia I (3 cr.)
ENFE 7235	Advanced Pharmacology for Anesthesia II (3 cr.)

Research Courses: 10 semester credit-hours

ENFE 7029	Evidence-Based Practice Principles (1 cr.)
ENFE 7257	DNP Evidence-Based Practice Project I (3 cr.)
ENFE 7262	DNP Evidence-Based Practice Project II (3 cr.)
ENFE 7027	Applied Biostatistics (3 cr.)

DNP Core Courses:13 semester credit-hours

ENFE 7240	Nursing Theories, Professional and Legal Aspects of Nurse Anesthesia Practice (3 cr.)
ENFE 7256	Informatics & Health Technologies (3 cr.)
ENFE 7254	Healthcare Policies (3 cr.)
ENFE 7241	A Team-Based Practice Approach to Healthcare Seminar (1 cr.)
ENFE 7400	Healthcare Finance & Economics (3 cr.)

[3] The courses identified with the alphanumeric code ENFE 7XXX are in the process of coding and registration as established by institutional regulations.

Anesthesia Specialty Didactic Courses: 19 semester credit-hours

ENFE 7133	Basics of Anesthesia I (3 cr.)
ENFE 7237	Basics of Anesthesia II (3 cr.)
ENFE 7251	Advanced Principles of Anesthesia I (2 cr.)
ENFE 7252	Advanced Principles of Anesthesia II (3 cr.)
ENFE 7300	Advanced Principles of Anesthesia III (2 cr.)
ENFE 7258	Anesthesia for Special Populations (3 cr.)
ENFE 7900	Comprehensive Nurse Anesthesia Examination (0 cr.)
ENFE 7XXX	Nurse Anesthesia Review (3 cr.) (Submitted for codification)

Clinical Courses: 24 semester credit-hours

ENFE 7238	Clinical Practice I (1 cr.)
ENFE 7239	Clinical Practice II (4 cr.)
ENFE 7253	Clinical Practice III (3 cr.)
ENFE 7255	Clinical Practice IV (3 cr.)
ENFE 7260	Clinical Practice V (3 cr.)
ENFE 7261	Anesthesia Residency I (5 cr.)
ENFE 7XXX	Anesthesia Residency II (5 cr.) (Submitted for codification)

DOCTOR OF PHILOSOPHY IN NURSING (PhD) PROGRAM

The PhD is a research-focused program designed to prepare nurse scientists with the investigative skills of a researcher. The graduate will be capable of developing and expanding the nursing body of knowledge, and able to build and use theoretical and practice models in the delivery of health care, to influence the health status of people, improve outcomes and quality of life, and promote public policies to address health care issues in the health care system in Puerto Rico.

The PhD degree is completed with 51 credits semester. The curriculum sequence of the Doctoral Program has four (4) academic years. The student will take one or two courses (4 to 7 cr.) per semester, during the years in the Program. The time to complete the program requirements may not exceed eight (8) years after initial registration. It is expected that the students will be enrolled full time in order to take courses in the blocks that they are offered.

Admission Requirements

Applicants interested in the Doctoral of Philosophy in Nursing (PhD) program must submit their completed applications by February of each year. The PhD Admission Committee cannot properly evaluate a candidate nor offer an interview until all required application items have been received. A completed application would include the following documents:

- Application packet for admission to the MSC of the UPR.
- Foreign students who have studied outside Puerto Rico or the United States must submit their academic record to the World Education Services (WES www.wes.org) for evaluation of credentials and possible equivalence to a degree offered in the United States and its territories. Cost of studies may vary according to country of origin.
- A nurse professional with a baccalaureate in nursing with a master's degree in nursing science or a master's degree in any other field from an accredited university with a minimum 3.00 GPA (on a 4.00 scale). An official transcript of all obtained academic degrees at the undergraduate nursing level and

graduate level must be presented. If the candidate applies for admission while completing their master's degree, admission to the PhD in Nursing Program will be conditional on presenting evidence of successful completion.

- Present evidence of completion of statistics course or their equivalent at the graduate level. It is preferable to have a course in research at a graduate level.
- Updated license to practice nursing in Puerto Rico or in his/her country of origin.
- Evidence of having one-year of nursing practice experience.
- Current curriculum vitae (CV): a complete summary with educational training, work and practice experiences, honors, awards, research, publications and presentations.
- Three letters of recommendation from academic, employer and professional sources who can comment on the potential of the applicant for doctoral study. At least one reference must possess an earned doctoral degree.
- An essay addressing (a) your personal statement, (b) your short-term professional goals statement focused on doctoral studies in nursing research, and (3) your long-term career plans and contributions you expect to make to the nursing profession. Use a separate sheet for each area and limit the essay to 3 pages, double-spaced, 11-point Arial font. Include your name and page number in the document.
- A short scholarly writing including your research area of interest, problem statement, background, the purpose of your intended research, and the potential impact of your research on nursing practice and the advancement of nursing science. Include relevant citations to support the background and problem statement. References list in current APA style. The limit is up to five double-spaced pages in 11-point Arial font. Include your name and page number in the document.

Additional Requirements

- Interview with PhD Admissions Committee members.
- Computer literacy and own a personal computer. The student must have a reliable Internet connection.
- Proficiency in speaking and writing Spanish and in reading and writing English.
- Participation in a doctoral of philosophy in nursing seminar during the summer.
- The candidate must obtain 70% or more as a result of the following criteria to be considered as a candidate for admission:

Interview with PhD in Nursing Program Faculty	25%
Essay on personal statement and professional goals	25%
Scholarly writing in research area interest	30%
GPA from master's degree	10%
GPA from bachelor's degree in nursing	10%
Total	100%

Graduation Requirements

- Awarding of degree requires that the candidate have completed all course requirements with established academic standing, approve the comprehensive examination and successfully defended the dissertation.
- General grade point average of 3.00 or higher (on scale of 4.00).
- Complete all courses with a minimum grade of B.

DOCTOR OF PHILOSOPHY IN NURSING (PhD) CURRICULUM

Total Credit Hours: 51 Semester C-H

ENFE 8005	Philosophy of Nursing Science	3
ENFE 8007	Qualitative Research Methods	3
ENFE 8008	Quantitative Research Methods	3
ENFE 8009	Theories of Nursing Sciences	3
ENFE 8010	Guided Study: Development and Validation of Research Instruments	2
ENFE 8011	Biostatistics for Nursing Research I	3
ENFE 8012	Biostatistics for Nursing Research II	3
ENFE 8016	Guided Research I	4
ENFE 8025	Seminar: Nursing Science and Public Policy	2
ENFE 8027	Mixed Methods Research	3
ENFE 8026	Guided Research II	4
ENFE 8990	Doctoral Dissertation I	4
ENFE 8991	Doctoral Dissertation II	4
ENFE 8992	Doctoral Dissertation III	4
Electives		6
Comprehensive Exam		0

COURSE DESCRIPTIONS

UNDERGRADUATE COURSES

ENFE 4075 - Introduction to Research and Evidence Based-Practice in Nursing (EBP). Three (3) credits. Pre-requisites: ENFE 4116
This theoretical course provides basic knowledge of the research process and diverse quantitative, qualitative and mixed designs, as well as ethical and legal aspects when conducting research. Students will be exposed to the Ohio State University College of Nursing Evidence-Based Practice Integration Model, for the development of clinical PICOT question (Patient, Intervention, Comparison, Outcome, and Time), types of questions and levels of evidence. The course also addresses the development of technological skills for the identification and use of different sources of information in order to evaluate them, as well as appraising and synthesizing the strengths and weaknesses of the evidence.

ENFE 4101 - Nursing Care of Adult and Elderly I. Six (6) credits.
In this course with theoretical and clinical component, the students apply knowledge, skills, and critical judgement in their intervention with adults and elderly in medical and surgical scenarios. It also includes theory and simulated practice of fundamental procedures to deliver basic care to real patients. The student is exposed for the first time to clinical practice in a real scenario using therapeutic communication, health history, and physical examination skills to identify patient health needs. The student starts in the care planning and nursing intervention with identified needs. This course will be offered face to face.

ENFE 4102 - Nursing Care of Adult and Elderly II. Six (6) credits. Pre-requisites: ENFE 4101, ENFE 4116, ENFE 4118, ENFE 4125.
This course with a theoretical and clinical experience component addresses the student in the integration of knowledge, skills and critical judgement in their interventions with adults and elderly with acute and chronic health conditions. Emphasizes in the pathophysiology of medical surgical conditions in adults and elderly and pharmacological therapy considering critical thinking in decision-making. The student continues to deepen in the application of nursing process.

ENFE 4116 - Introduction to the Nursing Profession. Four (4) credits.
This theory course introduces the student to the discipline of nursing. It presents the basic concepts that make nursing a profession, the basic roles of professional nursing practice standards and the nursing process as a tool to provide care. It emphasizes the ethical and legal principles, leadership, communication and the importance of teamwork. It provides the opportunity for the student begins to be displayed professionally in the globalized world. It starts conceptually in care planning and nursing intervention according to the needs identified. The characteristics of the level of care are described.

ENFE 4118 - Health History and Physical Examination. Two (2) credits.
In this laboratory course, the student identifies health problems in patients with a particular emphasis on the peculiarities of the old, through the interview for the health history taking and physical examination. Emphasis is placed on the development of communication skills, observation, data collection and analysis of findings. Learning experiences provided allows demonstration and practice of cognitive and psychomotor skills necessary for integrated and safe nursing care. This course will be offered face to face.

ENFE 4119 - Nursing Care of Women and Newborn. Five (5) credits. Pre-requisites: ENFE 4101, ENFE 4116, ENFE 4118, ENFE 4125.
This course with theoretical and clinical component provides the student with experiences in the nursing care of women during the early preconception stages, pregnancy, childbirth, post-partum, menopause and neonatal care. The goal of the course is to guide the student to acquire knowledge and develop

leadership skills in nursing care of women from preconception to menopause stages. Analyzed bio-psycho-social and cultural needs and the pathophysiology of the most common conditions of women and newborn.

ENFE 4120 - Nursing Care of Children and Adolescents. Five (5) credits. Pre-requisites: ENFE 4119, ENFE 4215, ENFE 4075.
In this course with theoretical and clinical component, it is emphasized the nursing care in the intervention with the child from infancy through adolescence. It emphasizes the pathophysiology, pharmacotherapy and genetics in the different health conditions. Discuss the acute, chronic and terminal conditions at each stage. The course includes clinical practice to initiate and develop skills in holistic pediatric care in various health care settings to improve levels of child welfare and family.

ENFE 4125 - Pharmacotherapy in Nursing. Three (3) credits.
This course, with a component of theory and laboratory skills, introduces the students to the principles of pharmacology, pharmacokinetics, pharmacodynamics and pharmacogenetics in drug therapy. The major classifications of drugs are discussed, with emphasis on actions, adverse reactions, interactions and nursing implications of each classification. Topics of study include skills, responsibilities and the use of nursing process to prepare and administer medications to patients through the life cycle. It considers the quality and safety standards, the ethical-legal, cultural and patient education in medication administration. The student develops basic skills to calculate doses and apply the techniques necessary for the administration of drugs, safely and accurately through different routes.

ENFE 4138 - Nursing Care of Family and Community. Five (5) credits. Pre-requisites: ENFE 4147, ENFE 4120.
This is a course with theoretical and clinical component of immersion in the community. It provides the opportunity to integrate previous knowledge to develop autonomy and leadership to intervene with individuals, families, groups and populations. Concepts of epidemiology, lifestyles, environment and genetic factors are applied to provide nursing care to the family and community. It emphasizes prevention, health promotion and lifestyles modification, using theoretical models and evidence-based nursing.

ENFE 4147 - Nursing Care of Psychiatry and Mental Health. Five (5) credits. Pre-requisites: ENFE 4102.
The course, with theoretical and clinical component, provides the knowledge that contributes to the development of a competent professional in the area of mental health and psychiatry with individuals, groups and communities in the three levels of prevention. It emphasizes the genetic aspect, the pathophysiology, pharmacology and the various theoretical models that explain the maladaptive behavior of human beings in the development of mental illness. It emphasizes the importance of providing compassionate nursing care based on evidence, which contributes to the highest safety and quality of care from the perspective of population diversity. Course changed from 6 to 5 credits since August 2016. Old title: Nursing Process with Individuals, Families, and Groups with Mental Health Interferences (changed since August 2016).

ENFE 4155 - Professional Nursing Practice. Six (6) credits. Pre-requisites: ENFE 4147, ENFE 4120.
This course of clinical immersion provides the opportunity to facilitate the student's transition to the professional roles as nurses. Students assumes the role of leaders and change agents implementing the problem-solving method to make a critical analysis of nursing situations identified in clinical practice settings. It emphasizes the role as a nurse generalist in the provision of care to individuals, families and communities. Clinical experiences can be conducted in settings of primary, secondary and tertiary levels.

ENFE 4165 - Legal Aspects of Nursing. Three (3) credits.
This course is designed to increase knowledge of legal principles, concepts, facts, and laws related to health and nursing practice. Opportunity is provided for the analysis of the above-mentioned topics so as to acquaint students with the rights and duties of the professional nurse in relation to the law.

ENFE 4185 - Care of the Elderly. Three (3) credits.
This course provides the opportunity to expand the knowledge of the historical, social, and cultural aspects affecting the aging individual. Opportunity is provided for the analysis of theories related to the aging process, the sociocultural changes in Puerto Rico, and the effect of those changes upon the old age population. Awareness and sensitivity toward the student's own aging process is encouraged.

ENFE 4195 - Concepts Related to Death and Dying. Three (3) credits.
This course is designed to increase the knowledge and skills necessary for the care of the dying person.

ENFE 4205 - Nursing System and the Interpersonal Relationship Processes. Three (3) credits.
This course is designed to expand the knowledge of the physical, environmental, and social factors that inference the interpersonal relationship. Emphasis is placed in the human life cycle as an inherent evolution in the development of the relationship and in the awareness of the influence that human behavior exerts in different levels of these relations. Students analyze principles, theories, and barriers related to the process of communication.

ENFE 4215 - Nutritional Needs. Three (3) credits Pre-requisites: ENFE 4101, ENFE 4116.
Course discusses the basic concepts of nutrition in a concise and practical manner and health care by the nursing professional. It examines the nutritional requirements caused by physiological changes during the life cycle, starting with gestation, postnatal growth, adulthood and old age. Nutritional concepts associated to the managements of health conditions will be analyzed during the course. Nutritional activities will help the nursing professional to apply the knowledge of nutrition in different conditions within the framework of the holistic care. Old title: Nutrition Needs Life Cycle (changed since January 2016).

ENFE 4225 - Cancer Nursing. Three (3) credits.
This course broadens the knowledge of the innovative approaches, modern methods, and modalities in the treatment of Cancer and nursing care management. The psychological, social, and economic impact of Cancer in families is discussed.

ENFE 4265 - Nursing Care of Individual with Coronary and Health Diseases. Three (3) credits.
This course expands the knowledge in the management of comprehensive care provided to the patient with coronary health problems and to his family. Emphasis is given to the role of generalist in the prevention, early detection of signs and symptoms of the conditions in the acute phase, convalescence, and rehabilitation. Opportunities are provided for students to develop specific skills in the expanded functions of the nurse (such as the electrocardiogram interpretation).

ENFE 4315 – Nursing Special Skills. Two (2) credits.
This elective course will be offered for students to acquire essential knowledge, skills and psychomotor skills to ensure effective, safe, compassionate, and patient-centered care. Includes theory and simulated practice of each procedure.

ENFE 4395 - Integrated Professional Nursing Concepts. Three (3) credits. Pre-requisites: ENFE 4120, ENFE 4147 and approval of Third Year Courses.
In this course students have, the opportunity to reexamine theories and clinical aspects of courses studied in their academic program, in an integrated form. The purpose of this course is to prepare students in

their efforts to take the professional practice exam according to Law #9, October 1987. Students will develop specific study skills that will help them organize, manage time, discriminate among multiple-choice questions, and manage anxiety in an effective manner, for the professional practice exam.

ENFE 5015 - Childbirth Education. Three (3) credits. Pre-requisite: Maternity Course/ Theory and Clinic.
In this course the student has the opportunity for an in depth exposure to perinatal education aspects and the interventions expected from the Health Professional. Emphasis will be given in health promotion and prevention complication during pregnancy as well as a positive experience during labor and birth. Specific aspects of childbirth education with the psychoprophylactic method will be covered with emphasis in breathing exercises, physical conditions, and relaxation techniques.

ENFE 5100 Nursing Process Applied to the Management of Individuals or Groups who Use and Abuse Substances. Three (3) credits. Pre-requisites: ENFE 4006, ENFE 4125, ENFE 4136, ENFE 4137, ENFE 4147 (The pre- requisites are not required for the Master Degree students).
This course presents an integral view of the addictive process and its effects in the health and well-being of individual's families, and communities within the Puerto Rican Society. Theories related to the development of addiction, the identification and evaluation of the clients who use and abuse alcohol and drugs, and treatment modalities are discussed. The learning experiences guide the students in the development of knowledge, attitudes and skills necessary for the intervention with persons who have addiction problems or with high-risk groups. The students shall intervene in a holistic way with individuals, families, and groups in different stages of growth and development. Nursing principles shall be integrated in the learning activities including direct care so that students apply their previous knowledge when working with dysfunctional patterns manifested in relation to the use and abuse of alcohol and drugs. Selected clinical experiences shall be carried out in different settings at the primary, secondary and tertiary level.

GRADUATE COURSES

CMED 6001 - Advanced Human Anatomy and Physiology I. Two (2) credits.
This is a first part of two courses designed for Health Professionals who need profound knowledge of Human Anatomy and Physiology. The Part I course emphasizes to processes related to the Cellular Physiology from a cell membrane processes and biophysics perspective. The Nervous and Endocrine Systems are studied. Various diseases will be discussed as models of pathophysiological processes.

CMED 6002 - Advanced Human Anatomy and Physiology II. Three (3) credits. Pre-requisite: CMED 6001.
This is a Second Part of a course designed for Health Professionals who need to profound knowledge of Human Anatomy and Physiology. The part emphasizes the Immune, Cardiovascular, Respiratory, Renal and Digestive Systems from the perspectives of the normal physiological processes and anatomical relation. The functional capacities of each system is analyzed with emphasis on the physiological principles and the human response to a variety of stimulus.

CMED 6005 - Advanced Concepts in Human Anatomy and Physiology. Five (5) credits.
This course is designed for Health Care Professionals who need advanced knowledge in Human Anatomy and Physiology. The Cellular Physiology is discussed based on concepts from biophysics of the cellular membrane and basic cellular processes. The Nervous, Endocrine, Immunologic, Hematologic, Cardiovascular, Respiratory, Urine, and Digestive Systems are studied from the perspectives of the normal physiological processes and anatomical relations. The functional capacities of each system is analyzed with emphasis on the physiological principles and the human response to a variety of stimulus.

ENFE 5015 - Childbirth Education. Three (3) credits. Pre-requisite: Maternity Course/ Theory and Clinic.
In this course the student has the opportunity for an in depth exposure to perinatal education aspects and the interventions expected from the Health Professional. Emphasis will be given in health promotion and prevention complication during pregnancy as well as a positive experience during labor and birth. Specific aspects of childbirth education with the psychoprofilactic method will be covered with emphasis in breathing exercises, physical conditions, and relaxation techniques.

ENFE 5100 - Nursing Process Applied to the Management of Individuals or Groups who Use and Abuse Substances. Three (3) credits.
This course presents an integral view of the addictive process and its effects in the health and well-being of individuals' families, and communities within the Puerto Rican Society. Theories related to the development of addiction, the identification and evaluation of the clients who use and abuse alcohol and drugs, and treatment modalities are discussed. The learning experiences guide the students in the development of knowledge, attitudes and skills necessary for the intervention with persons who have addiction problems or with high-risk groups. The students shall intervene in a holistic way with individuals, families, and groups in different stages of growth and development. Nursing principles shall be integrated in the learning activities including direct care so that students apply their previous knowledge when working with dysfunctional patterns manifested in relation to the use and abuse of alcohol and drugs. Selected clinical experiences shall be carried out in different settings at the primary, secondary and tertiary level.

ENFE 5225 - Health care for individuals and families from the LGBTQ+ community. Three (3) credits.
This course of theoretical component is focused on providing the knowledge and skills to health professionals for the safe and sensitive management of individuals and families of the LGBTQ+ community, supported by the best evidence available. The goal is to provide learning experiences that promote holistic care for individuals and families of the LGBTQ + community, considering knowledge related to gender, sexuality, stigma, health disparities and applicable ethical-legal aspects. In addition, it offers the resources to establish effective communication between individuals and families of the LGBTQ+ community and the health team. The course will be taught using the hybrid modality

ENFE 6602 - Nursing Intervention throughout the Maternal Cycle. Six (6) credits.
Theories, principles, and facts relevant to the women from conception and pregnancy through the neonatal period are studied. Emphasis is placed on the development of the individual and the family. Normal, pathological, and psychopathological modes of man's interaction are examined. Physical and psychological stress factors and coping mechanisms are studied in depth for its application in the practice of advanced nursing throughout the maternity cycle. The practical component of this subject consists of the clinical study of the family through the pregnancy cycle. It includes the ministering of care based on the nursing process and nursing theories applying and testing previously and presently acquired knowledge to help mothers in the attainment of the maternal role. The clinical practice is carried out in maternity centers and/or the clients' homes.

ENFE 6603 - Nursing Intervention with Children and Adolescents. Six (6) credits.
In depth study of the life process from infancy through adolescence, within the context of the family. Emphasis is given to the sequential growth and development of the child through adolescence and to the intervening environmental, physical, and psychological factors significant in shaping the nature and direction of adapting behavior and in determining health and illness. Knowledge of prevalent pathological conditions of special relevance to this age group is included. The practical component of this course consists of the clinical study for children and adolescents. It includes performing the nursing process utilizing previous knowledge, applying, and testing nursing theories in the direct care of clients in hospitals, clinics, community agencies, and/or in the clients' homes.

ENFE 6604 - Nursing Intervention with Adult Persons. Six (6) credits.
In depth study of theories and concepts from the Physical, Biological, and Behavior Sciences geared toward the development of a better understanding of adult persons. They relate the implications of these theories and concepts to nursing interventions. The students examine in detail the specific developmental characteristics of adult persons and the responses of adults to health disruptions; they study in depth the most prevalent health problems of adults, and identify nursing strategies to better assist adult persons to achieve their optimum health potential. They increase competence in the practice of clinical nursing by further refining their skills in carrying out nursing actions. Emphasis is given to increase the students' skills in the use of assessment tools to evaluate the person's health situations and the effectiveness of nursing intervention. The students carry out nursing actions with selected persons in the adult stage of the life process in settings where primary, secondary, and/or tertiary care is provided.

ENFE 6605 - Nursing Intervention with Elderly Persons. Six (6) credits.
In depth study of theories and concepts from the Physical, Biological, and Behavioral Sciences geared toward the development of a better understanding of elderly persons. They relate the implications of these theories and concepts to nursing intervention. The course includes detailed examination of the developmental characteristics of elderly persons and the responses of the aged to developmental changes and health disruptions, study of most prevalent health problems of the elderly, and identification of nursing strategies to better assist elderly persons to achieve their optimum health potential. They increase competence in the practice of clinical nursing actions and in the use of assessment tools to evaluate the person's health situation and the effectiveness of nursing intervention. The students carry out nursing actions with selected elderly persons in settings where primary, secondary, and/or tertiary care is provided.

ENFE 6606 - Nursing Intervention with the Family Unit. Six (6) credits.
Theories, concepts, and skills related to the family as a unit are discussed and applied in nursing interventions in a variety of health care settings and/or clients' homes. Emphasis is placed on different patterns of organizations and on the dynamics of individual-family-community interactions. Family disorganization, the vulnerable family, and society mores are analyzed. The students apply the principles of primary, secondary, and tertiary prevention to families or they cope with health-illness situations.

ENFE 6607 - Nursing Intervention with the Community. Six (6) credits.
Theories, concepts, and skills related to the community as collective man are discussed and applied in nursing interventions in a variety of settings; emphasis is given to the community structure, organization, the political process, and the interrelationship of ecological factors. Assessment tools for community diagnosis are developed and utilized. Implementation of the nursing prescription to meet the identified health needs and the application of related theories are carried out in selected communities.

ENFE 6608 - Nursing Research. Three (3) credits. Pre-requisite: BIOE 6525.
In depth, examination of the scientific process of investigation as it relates to clinical nursing is emphasized. Through critical analysis of scientific nursing studies, the comprehension of the scientific process is deepened and extended. Students have the opportunity to develop a research proposal to study a nursing problem.

ENFE 6609 - Theory in Nursing Services Administration. Four (4) credits.
Theories, concepts, and practices involved in the administrative process of nursing are in depth studied. Emphasis is given to the administrative process, problem-solving and decision-making models. Students are expected to analyze research findings to find best evidences for nursing administration. Analysis of challenges that nurse manager faces in workplace in order to ensure establishment and maintenance of positive, safety and proactive performance. Students should demonstrates the necessary domains of a

healthy work providing motivational opportunities for all generational groups defined by professional nursing organizations.

ENFE 6610 - Practice in Nursing Services Administration. Five (5) credits. Pre-requisite: ENFE 6609.
The executive nurse role practice involves transforming one's professional identity. Students have the opportunity to implement knowledge and skills previously acquired. Learning experiences provide for transitions from a caring to a manager in nursing role. This executive nurse role practice offers opportunities to recognize one's own expectations, resources, and management potential. Students practice strategies to develop a successful nurse executive role working through and with unique individuals in a rapidly health service changing environment.

ENFE 6611 - Theory of Teaching in Nursing. Four (4) credits.
This course is designed in order to facilitate in student the acquisition of knowledge and development of skills needed for performing the teaching role in higher education in nursing. The student has the opportunity to study concepts and theories related to curriculum, teaching learning strategies, evaluation techniques and learning assessment. Concepts related to socialization, philosophical foundations, and ethical and legal aspects linked to the teaching process are analyzed.

ENFE 6612 - Practice of Teaching in Nursing. Five (5) credits. Pre-requisite: ENFE 6611.
This subject matter is structured giving emphasis to the development of teacher’s functional role skills. This practice provides the opportunity for students to apply knowledge of concepts and learning theories. Students are assigned for practice in Bachelor in Nursing and or Associate in Nursing programs.

ENFE 6613 - Clinical Nurse Specialist Role I. Four (4) credits.
Study of the different theories and concepts involved in the role of clinical nurse specialist. In depth exploration of the knowledge pertinent to the area of the specialty selected, and the skills of evaluation and intervention while giving direct patient care are refined.

ENFE 6614 - Clinical Nurse Specialist Role II. Five (5) credits.
The role of clinical nurse specialist in the different health agencies, which provide primary, secondary, and tertiary care. Analysis of complex situations, direct intervention with selected patient and the development of clinical competencies.

ENFE 6615 - Research Project. Three (3) credits. Pre-requisite: ENFE 6608
Students have the opportunity to concentrate on the study of a problem related to nursing practice utilizing research methodology. The students are guided to identify preferable a nursing problem from one of their selected clinical courses. Under the preceptorship of a faculty member, they carry out their research project and report their findings.

ENFE 6616 - Development of Education Programs for Nursing Personnel. Three (3) credits.
The content of this course focuses on analyzing the philosophy, objectives and nature of education programs for the development of nursing personnel. Principles of planning, organizing, directing, and evaluating personnel development programs for nursing staff of a health agency are included. Various theories related to adult teaching and learning are examined. Some aspects of the content and theories studied are implemented through externship experiences. Course emphasizes commitment to lifelong learning and ethical issues. Continuing education programs and its importance to provide current information about changing health care environment are also discussed.

ENFE 6617 - Nursing Intervention in Mental Health and Psychiatry I. Six (6) credits.
In depth study of theories related to the field of Mental Health as well as theories of growth and development and human behavior. This course also includes the study of emotional disorders and social pathology of clients throughout the life cycle. Emphasis is given to the development of skills needed to offer nursing care in the mental health psychiatric nursing settings. The students develop instruments for the assessment of nursing needs and the evaluation of the nursing care given. Participation in sensitivity group experiences for the development of self-awareness and personal growth are part of the learning experiences in this course.

ENFE 6618 - Mental Health and Psychiatry Nursing II. Six (6) credits.
This course is based on the knowledge, skills, and attitudes developed in the course ENFE 6617. The main focus is the life process of man and his interpersonal relationships within the family, groups, and community structures. The students apply and test theoretical models utilized in the practice of mental health and psychiatric nursing with families, groups and communities in primary, secondary, and tertiary settings. Emphasis is given to the development of skills as a psychotherapeutic nurse in the intervention with families, groups, and communities who have patterns of disorganization. The nursing process is utilized in the analysis of high risk factors that threaten the mental health of individuals. It also includes the identification of inadequate patterns of functioning in the family groups and community systems with the purpose of formulating the nursing diagnosis, establishing a plan of intervention and evaluating its effectiveness. The students develop instruments for assessing the health status of the community to detect high risk factors in the community. They also develop instruments to evaluate the effectiveness of their nursing intervention.

ENFE 6621 - Evidence Based Research for FNP. Three (3) credits.
In this course, students will have the opportunity to examine nursing research designs and methods in depth, through critical appraisal of research published in journals. Special emphasis will be given to evidence based research. Students will develop knowledge and skills to apply research based evidence into family practice. It is expected that students will develop an evidence based research proposal in the outpatient primary care scenario. The student will be guided in the step-by-step process.

ENFE 6622 - Evidence Based Research Project for FNP. Three (3) credits. Pre-requisites: ENFE 6621.
In this course, students will have the opportunity to conduct the research process independently with the instructor supervising the application of the research proposal drafted in the previous course.

ENFE 6625 - Bioethics in Nursing. Two (2) credits.
Current bioethics issues in nursing are analyzed and discussed in this course. The nature and needs of the human as a thinking being are discussed in relation to the purpose and functioning of health care systems in the society. Different dilemmas are selected and analyzed to justify the most appropriate decisions and actions to solve them in an ethical manner. Discussion will be directed to ethical dilemmas in the context for health systems.

ENFE 6626 - Nursing Trends: Philosophy, Theory, and Practice. Four (4) credits.
This course explores the historical, philosophical and theoretical foundations of nursing science and the evolution of research that has contributed to the development of nursing knowledge, nursing theories and advances in evidence-based nursing. Conceptual models and nursing theories that serve as a framework for nursing practice, research, leadership and interventions are examined, critiqued, and evaluated. The connection between theory, practice, leadership and research and its importance for nursing practice and profession is analyzed. Nursing theories and their contribution to the establishment of public policy are studied and analyzed. The course can be offered in face to face, hybrid, distance learning, or online modality.

ENFE 6635 - Nursing Intervention with Critically ILL Persons I. Six (6) credits.
This is the First Part of a sequence of two courses on Advanced Critical Care Nursing Intervention. The concept "Critical State" is integrated with the nursing process, holism, growth & developments and pathophysiology. The scientific method-instrument application-is utilized as reference for the advanced nursing intervention with patients in critical care conditions. The clinical phase of the course will be in the different types of critical care units of secondary & tertiary agencies.

ENFE 6636 - Nursing Intervention with Critically ILL Persons II. Six (6) credits. Pre-requisites: ENFE 6635.
This course is designed to develop nursing professionals at a graduate level with advanced skills in nursing intervention with patients in critical care settings. The concept "Critical State" is integrated with others like nursing process, holism, growth, development, and pathophysiology, which are fundamental to the nursing intervention. The clinical phase of the course will be carried out in the critical and intensive care unit specialties that are located in secondary and tertiary health care agencies.

ENFE 6650 - Advanced Physical Assessment. Three (3) credits.
In this course, the students discuss, carry out, interpret theoretical knowledge, and develop psychomotor skills related to physical assessment of the individual and family throughout the life cycle. They develop communication skills needed for health history taking. Through the health history taking process, they develop critical analysis skills to identify the final differential diagnosis. They will have the opportunity to interact with clients in different clinical settings, especially in primary care areas. In addition, they will give emphasis to health promotion and preventive intervention including planning culturally sensitive care.

ENFE 6651 - Advanced Pathophysiology. Three (3) credits.
In this, course students analyze the complex interrelationships and interdependence of pathophysiological concepts that produce alterations in the human functioning across the life spam. This will serve as a primary component of the foundation for clinical assessment, decision-making, and management or advanced nursing practice. Content includes the cell, genetics, cancer, and pathophysiology of the following systems: Neurologic, Endocrine, Reproductive, Hematologic, Cardiovascular and Lymphatic, Pulmonary, Renal, Digestive, Muscular, as well as Multiple Organ Dysfunction Syndrome. This course may be offered in face to face, hybrid, distance learning or online modality.

ENFE 6652 - Advanced Pharmacology for Nursing. Three (3) credits.
This course provides in-depth knowledge and skills of pharmacology, pharmacokinetics, and pharmacotherapeutics. Students comprehensively focus on the pathophysiological dynamic processes that occur in common acute and chronic health problems across the lifespan and related pharmacologic therapies. A solid foundation in the concepts and principles of the most pertinent drug categories and their therapeutic implications to clinical nursing practice is emphasized. Students incorporate the scientific literature to find evidence about outcomes, safety, quality, and cost-effective pharmacologic therapies. Also, the students appreciate the psychological, social, cultural, economic, ethical, and legal aspects involved in pharmacologic therapies and medication adherence. The course can be offered in face to face, hybrid, distance learning, or online modality.

ENFE 6656 - Nursing Theories Seminar. One (1) credit.
An in depth study of all dimensions of the human being, based in a holistic, biopsychosocial and spiritual vision is done in this course. Philosophical viewpoints and their application to the human being, as well as theories and developmental concepts are examined. Nursing theories and their application to nursing practice are also analyzed.

ENFE 6657 - Primary Care in the Lifecycle. Two (2) credits.
Within this course, students discuss and analyze concepts and theories related to health promotion, illness prevention and health maintenance. These concepts and theories of the health illness continuum are analyzed and related to individuals, family and community. Beliefs, practices, disparities and values related to health are analyzed according to different cultures within Puerto Rico. Different human development theories, epidemiological concepts applied to advance nursing practice, as well as health promotion strategies and illness prevention, are analyzed.

ENFE 6658 - Differential Diagnosis Seminar. One (1) credit.
This course is focused on the application of theoretical knowledge and data collected from the client to establish a differential diagnosis. This diagnosis is identified depending on findings from the health history and physical assessment. This course will be offered concurrently with the Advance Physical Assessment course. Case studies will be discussed, based on topics presented in the Physical Assessment course.

ENFE 6661 - Primary Care I. Five (5) credits. Pre-requisites: ENFE 6650, ENFE 6651, ENFE 6657, ENFE 6658.
First part of a three-part series of courses, which increase in level of competence, knowledge and expertise, focused on primary care practice. This course emphasizes the theoretical concepts in health promotion and illness prevention in individuals of all ages. Includes diagnosis, therapeutic and non-therapeutic management, of common, acute and chronic health problems. Concepts and theories regarding nursing, transcultural nursing, teaching and learning theories, family systems theory, principles of counseling and therapeutic communication are integrated in class and in their clinical experience. Students will assess, diagnose and manage in collaboration with physicians and other health professionals, acute and chronic health problems. Clinical components will be divided as follows: 1/3 ob-gyn, 1/3 in pediatrics, and 1/3 in family practice scenarios at *Centros Mas Salud de San Juan*.

ENFE 6662 - PRIMARY CARE II. Five (5) credits. Pre-requisites: ENFE 6661.
This course emphasizes the theoretical concepts in health promotion and illness prevention in individuals of all ages. Include diagnosis, therapeutic and non-therapeutic management, of common, acute and chronic health problems including health maintenance issues, cardiovascular adults, cardiovascular pediatrics, arterial and venous disorders, hematological disorders, immunologic disorders, arthritic disorders, musculoskeletal disorders, ophthalmologic disorders, endocrine disorders, GI disorders, nutritional disorders, concepts and theories regarding nursing, trans-cultural nursing, teaching and learning theories, family systems theory, principles of counseling and therapeutic communication are integrated in class and in their clinical experience. The clinical course hours will be divided accordingly: one third in ob-gyn, one third in pediatric and one third in adult family practice settings of “Centros Mas Salud de San Juan”.

ENFE 6663 - Primary Care III. Five (5) credits. Pre-requisites: ENFE 6662.
This course continues developing the concepts and skills of the previous course Primary Care II for common, acute and chronic health problems including: genitourinary, gynecologic, musculoskeletal, neurologic, and hematology problems; normal and high risk pregnancy; sexually transmitted diseases; family planning; and emergencies. Concepts and theories regarding nursing, trans-cultural nursing, teaching and learning theories, family systems theory, principles of counseling, and therapeutic communication are integrated in class and in their clinical experience. Students will assess, diagnose and manage in collaboration with physician and other health care professionals. The clinical course hours will be divided accordingly: one third in ob-gyn, one third in pediatric and one third in adult family practice settings of Centros Mas Salud de San Juan.

ENFE 6664 - Residency in Primary Care. Six (6) credits. Pre-requisites: ENFE 6663.
The focus of this course is the functioning of the family nurse practitioner student as a primary care provider working in collaboration with other health care providers in a selected practice setting. This experience will provide to the family nurse practitioner student the opportunity for the role analysis and role integration through application of theory in the clinical setting. The student will continue to apply and refine knowledge and skills previously learned and continue to develop competencies as family nurse practitioner. Discussion of the clinical experiences will provide for the integration of the management of clinical cases and models of practice.

ENFE 6665 - Pharmacology for Family Nurse Practitioner. Four (4) credits. Pre-requisites: ENFE 6650, ENFE 6651, ENFE 6658.
This course provides the practical exposure to general principles of providing and monitoring drug therapy as Family Nurse Practitioner. Identification of acute and chronic diseases, as well as the drugs to treat them will be discussed. Students will analyze how to prescribe systematically and upon protocols in collaboration with physicians, considering patients' needs and adjusting therapy upon the established protocol.

ENFE 6666 - Trends and Issues in Nursing. Three (3) credits.
This course provides for the analysis of current issues in nursing. The impact of trends and scientific findings in nursing and how these affect to professional practice is discussed. Current trends are considered in their effect to decisions and advancement of nursing. Diversity challenges are considered in their own interpretations and perspectives. Economic, social, political, cultural, legal, and ethical factors are analyze relative to its influence to health care and specifically nursing practice. Emphasis is given to the role that nurses can play in effecting change.

ENFE 6675 - Diagnostics for Primary Care. Two (2) credits. Pre-requisites: ENFE 6650, ENFE 6651, ENFE 6657, ENFE 6658.
Students will develop advanced practice proficiency in the ordering, analysis and interpretation of appropriate diagnostic tests related to primary care for accurate diagnosis, treatment and referral. Knowledge of clinical decision-making will be discussed. This includes comprehension of important pathophysiologic, epidemiological, psychosocial and clinical management concepts that will help the FNP to determine which diagnostic tests are indicated given the patient's clinical presentation. Discussion and practice of proper specimen collection, handling of specimens, appropriate use of diagnostic tests, accurate interpretation of test results with an appreciation of sensitivity and specificity of the particular test and appreciation of time factors that influence availability and interpretation of test results will also be included. Practical laboratory sessions will be given concurrently with the theory sessions.

ENFE 6676 - Nursing Theories, Professional and Legal Aspects. Three (3) credits.
Students analyze selected nursing theories based on the concept of advanced nursing in anesthesia in today's span of practice. Issues surrounding the discipline of nurse anesthesia as a profession are discussed. The scope of practice, legal regulations of the specialty, professional organizations functions and responsibilities that guide the ethical behavior of the nurse anesthetist will be discussed.

ENFE 6677 - Advanced Health Assessment for Anesthesia. Three (3) credits. Co-requisites: ENFE 6678.
The course provides nurse anesthesia students the opportunity of developing theoretical knowledge and skills for performance of advanced health assessment of clients during the preoperative period. Students practice collection of comprehensive health history, physical examination, and documentation of findings. Special emphasis is placed on an evaluation of the four principal regions considered critical for the preoperative assessment.

ENFE 6678 - Human Anatomy and Physiology. Three (3) credits.
The course will study the cellular basis of anatomy and physiology with emphasis in the respiratory, central nervous, musculoskeletal, hepatobiliary and gastrointestinal, renal, hematology and immune system functions. It addresses the physiological principles required to understand the human systems functions. The student is expected to understand the anatomical and advanced physiological responses of the human body.

ENFE 6679 - Chemistry, Biochemistry and Physic Principles Related to Anesthesia Practice. Three (3) credits.
The course is designed to relate chemistry, biochemistry and physic laws to the science and practice of anesthesia. Emphasis is placed on the chemical and physical properties of the anesthetic agents and the biochemical systems affected in the biotransformation of the fluid agents. Gas laws are analyzed within the context of the physiology of the human body. This course prepares students to apply the critical thinking skills related to anesthesia administration. It also facilitates the development of the necessary background in chemistry, biochemistry and physics as applied to the practice of anesthesia.

ENFE 6701 - Advanced Pharmacology I. Three (3) credits. Pre-requisites: ENFE 6678, ENFE 6679, ENFE 6705. Co-requisites: ENFE 6703, ENFE 6711.
The course focuses on advanced pharmacology concepts in anesthetic administration, emphasizing in the synthesis of pharmacodynamics and pharmacokinetic properties of anesthetic agents. Emphasizes the pharmacology of specific agents used for different types of anesthesia including adjuvant drugs and their effects. The course covers the legal and ethical principles related to anesthetic drug administration. Students will learn about evidence-based practice in pharmacologic anesthesia management.

ENFE 6702 - Advanced Pharmacology II. Three (3) credits. Pre-requisites: ENFE 6701. Co-requisites: ENFE 6704, ENFE 6713, ENFE 6722.
The course focuses on the advanced pharmacology concepts in anesthetic administration and emphasizes the pharmacodynamics and pharmacokinetic principles of the specific anesthetic agents and adjuvant drugs. It emphasizes the pharmacology and clinical implications of local anesthetics, muscle relaxant agents, antagonists and cardiovascular agents. The course also focuses on legal-ethical principles and evidence based practice in anesthesia pharmacology.

ENFE 6703 - Advanced Pathophysiology I. Three (3) credits. Pre-requisites: ENFE 6678, ENFE 6679, ENFE 6705. Co-requisites: ENFE 6701, ENFE 6711.
The course integrates disease physiological concepts such as etiology, pathogenesis, clinical course, clinical manifestations, differential diagnosis, determination of risks factors and their clinical implications. Students will develop skills and understanding of pathophysiologic mechanisms and disease processes to identify and analyze patient findings that serve as the foundations to develop a patient management plan for anesthesia patients during the perioperative period. The course covers pathological conditions, which have specific relevance for clinical decision making of anesthesia management with emphasis on: principles of cell physiology and transport mechanisms, genetic alterations, cancer, immunity, infections/inflammatory processes and the pathophysiology of cardiovascular, hematological, respiratory, and central nervous systems, and musculoskeletal disorders. Correlations of laboratory studies/findings with clinical manifestations of diseases are integrated.

ENFE 6704 - Advanced Pathophysiology II. Three (3) credits. Pre-requisites: ENFE 6703.
The course integrates physiological concepts of disease. Students will develop skills and understanding of pathophysiologic mechanisms and disease processes to identify and analyze patient findings that serve as the foundations to develop a plan of management for anesthesia patients in the perioperative period. The course integrates pathological conditions, which have specific relevance for clinical decision making of

anesthesia management, with emphasis on renal, hepatic, gastrointestinal, endocrine, reproductive, and the multiple organic dysfunction syndrome. Correlation of laboratory studies/findings with clinical manifestations of disease is integrated.

ENFE 6705 - Basics of Anesthesia. Four (4) credits.
The course provides nurse anesthesia students a comprehensive study of basic principles and skills that are essential to anesthesia practice. Students are acquainted with preoperative assessment of patients, anesthesia methods, techniques, and equipment, and airway management. Other areas discussed include: fluid and blood replacement, positioning, monitoring devices, pain management, and postanesthesia care. The acquisition of basic skills is enhanced by laboratory experiences.

ENFE 6711 - Clinical Practice I. Three (3) credits. Pre-requisites: ENFE 6705, ENFE 6677, ENFE 6678, ENFE 6679. Co-requisites: ENFE 6701, ENFE 6703, ENFE 6676.
The course introduces nurse anesthesia students to the scope and standards for nurse anesthesia clinical practice. Focuses on the application of clinical judgement in different situations, responsibilities, and tasks associated with the practice. It includes the application of clinical competencies with anesthesia equipment, clinical monitoring, preoperative evaluation of patients, fluids and blood replacement, positions, airway management and devices, different types of anesthesia, and post-operative pain management. The course also comprises: hypotension and hypothermia, monitored anesthesia care, and other anesthesia methods.

ENFE 6712 - Clinical Practice II. Three (3) credits. Pre-requisites: ENFE 6711. Co-requisites: ENFE 6721.
The course includes clinical performance with patients who receive anesthesia care for hepatobiliary, gastrointestinal, eyes, ears, nose and throat, maxillofacial and other important surgical procedures such as laparoscopic surgery, orthopedic trauma, and critical care. Anesthesia management of the geriatric population is included. Students apply knowledge related to anesthesia agents and methods and anesthesia delivery system to assure patient safety. Nurse anesthesia students practice under the direct supervision of the CRNA or MDA clinical preceptors.

ENFE 6713 - Clinical Practice III. Three (3) credits. Pre-requisites: ENFE 6712. Co-requisites: ENFE 6702, ENFE 6704, ENFE 6722.
The course includes clinical performance with patients who receive anesthesia care for neurosurgical, musculoskeletal, endocrine, and renal surgical procedures. They apply knowledge related to anesthesia agents and methods in anesthesia delivery systems to assure patient safety. Students practice with the direct supervision of the CRNA or MDA clinical preceptor.

ENFE 6714 - Clinical Practice IV. Three (3) credits. Pre-requisites: ENFE 6713. Co-requisites: ENFE 6717, ENFE 6723, ENFE 6725.
The course is designed for clinical judgement application and decision-making in the development of skills with patients undergoing anesthesia for cardiovascular and respiratory surgeries. Students are allowed to participate in the perioperative period with direct supervision of CRNA or MDA clinical preceptors.

ENFE 6717 - Evidence-Based Practice for Anesthesia. Three (3) credits. Co-requisites: ENFE 6714, ENFE 6723, ENFE 6725.
This course enhances students' theoretic and clinical foundations via incorporating evidence-based theory into clinical anesthesia practice. A review and synthesis of current published research relevant to the student's area of interest is required. Students are required to develop, under faculty advisement, in-depth presentations utilizing an evidence-based framework that integrates research evidence into current clinical practice. This course provides the tools for students to evaluate translate and integrate published research results into clinical practice. Students will learn how to search and assess the best clinical evidence, and how

to integrate the research results with the patient's values and preferences across clinical sites. Old title: Evidence-Based Research for Anesthesia (Changed since January 2016).

ENFE 6721 - Advanced Principles of Nurse Anesthesia Practice I. Three (3) credits. Pre-requisites: ENFE 6701, ENFE 6703, ENFE 6705, ENFE 6711. Co-requisites: ENFE 6712.
Throughout the course, nurse anesthesia students will analyze the different anesthesia methods and positioning for intra-abdominal, extrathoracic, extremities, ear, nose, throat, neck, and maxillofacial surgeries. The course provides in-depth coverage of anesthesia management of the surgical procedures on each organ system mentioned, considering communication, teamwork and knowledge to protect patient safety. It also discusses the geriatric population, trauma and critical care regarding anesthesia management.

ENFE 6722 - Advanced Principles of Nurse Anesthesia Practice II. Three (3) credits. Pre-requisites: ENFE 6721. Co-requisites: ENFE 6702, ENFE 6704, ENFE 6713.
This course provides nurse anesthesia students the opportunity to study concepts related to surgical procedures of the central nervous, neuroskeletal, skeletal, endocrine, and renal systems. It analyzes anatomical, physiological, and pathophysiological considerations of regional anesthesia and its techniques. Integrates different anesthesia management approaches related to each system's alteration. The course emphasizes neuropathophysiology, peripheral nervous system, and neuroanesthesia. It also includes renal, endocrine, musculoskeletal pathophysiology, and anesthesia management. Effective communication and teamwork are included to assure continuity of care and patient safety.

ENFE 6723 - Advanced Principles of Nurse Anesthesia Practice III. Three (3) credits. Pre-requisites: ENFE 6721, ENFE 6722. Co-requisites: ENFE 6714, ENFE 6717, ENFE 6725.
The course seeks to increase and apply the students' knowledge of advanced courses, basic anesthesia physiology and clinical practice in offering anesthesia delivery care. It examines anesthetic and nursing considerations for patients with pathophysiologic disruptions requiring surgical interventions in the cardiovascular and respiratory systems. Considers communication and teamwork to assure continuity of care and patient safety. The course provides insights into the anesthetic management for patients in cardiac, vascular and respiratory surgery. Conferences emphasize problem-based learning (PBL) allowing the student to integrate advanced physiology and nursing knowledge, skills and critical thinking.

ENFE 6725 - Obstetric, Neonatal, and Pediatric Anesthesia. Three (3) credits. Pre-requisites: ENFE 6702, ENFE 6704. Co-requisites: ENFE 6714, ENFE 6717, ENFE 6723.
The course develops in the nurse anesthesia student the critical thinking and evidence-based knowledge needed in caring for pregnant women, neonates, and the pediatric population. Physiologic differences that affect the anesthetic plan, pharmacokinetics and pharmacodynamics are discussed in relation to normal pregnancy, the neonate and pediatric patients. In addition, appropriate interventions are discussed for prevention and management of anesthesia complications.

ENFE 6731 - Anesthesia Residency I. Four (4) credits. Pre-requisites: ENFE 6714, ENFE 6717, ENFE 6723, ENFE 6725.
Clinical course in which the nurse anesthesia students have the opportunity to integrate theory within clinical practice. Clinical performance is focused on perioperative interventions with patients undergoing all types of surgeries utilizing different types of general, regional and local anesthesia with varied populations. Students practice anesthesia procedures and techniques related to all phases of anesthesia delivery. The nurse anesthesia student must function under indirect supervision of the clinical preceptor as an advanced practitioner in collaboration with the health clinical team. The clinical correlations conferences are integrated.

ENFE 6732 - Anesthesia Residency II. Five (5) credits. Pre-requisites: ENFE 6731, ENFE 6900. Co-requisites: ENFE 6795.
Clinical course in which anesthesia students function as advanced practitioners applying clinical competencies related to all phases of anesthesia delivery. Clinical performance focuses on perioperative interventions with patients undergoing all types of surgery and utilizing different types of general, regional and local anesthesia methods. Clinical correlation conferences are integrated. All students must take the self-evaluation examination (SEE) and acquire the advanced knowledge that will prepare them to pass the national certification examination (NCE).

ENFE 6795-Evidence-Based Practice Seminar. Three (3) credits. Pre-requisites: ENFE 6717.
This Evidence Based Practice (EBP) seminar course is designed to help nurse anesthesia students use specific approaches to evaluate the quality and applicability of relevant research/evidence. This course is designed to provide the tools for students to evaluate, translate, and integrate published research and other evidence results into clinical practice. Students will be working on their individual or group capstone projects throughout the course until final approval. Old title: Research Seminar (Changed since January 2016).

ENFE 6900 - Comprehensive Nurse Anesthesia Examination. Zero (0) credits. Pre- requisites: Approval of the courses of the first two years of the program.
This course is designed to ensure that the student goes through the evaluation process that provides the comprehensive examination of anesthesia nursing. The course provides a period of preparation through independent study in which the student reviews and consolidates concepts, basic and advanced sciences, and anesthesia principles introduced in the previous courses. The student is then exposed to the experience of the comprehensive examination, and through its approval, he/she will show the assurance of the depth and breadth of knowledge. Examination approval is a prerequisite for the start of the second residence established in the curriculum of the program. Grading system: Passed (P), Not Passed (NP)

ENFE 6995 - Independent Study. One to three (1-3) credit(s).
The course provides the student the opportunity to develop critical thinking and independent study skills. The student examines and studies topics related to nursing practice according to their needs and interests. Some areas to be studied are advanced clinical nursing, functional roles and others related to the nursing practice.

GRADUATE COURSES

DOCTOR IN NURSING PRACTICE WITH SPECIALTY IN ANESTHESIA (DNP-SA)

ENFE 7027 - Applied Biostatistics. Three (3) credits.
Through interactive lectures and group discussions this course provides a study of both descriptive an inferential statistic to enable students in applying and critically analyzing statistical methods and results emanating from scientific research or data analysis. Knowledge gained during this course will prepare the student for appraisal of scientific evidence in future courses and advanced nursing practice.

ENFE 7028 – Chemistry, Biochemistry, and Physics for Anesthesia. Three (3) credits.
Through interactive lectures, group discussions and Problem Based Learning, among other instructional strategies, this course provides an in-depth analysis of chemistry, biochemistry and physics as it relates to the science of anesthesia. Students are expected to acquire the necessary tools to develop expert knowledge in pharmacology, anatomy, physiology, pathophysiology, basic and advanced principles of anesthesia.

ENFE 7029 - Evidence-Based Practice Principles. One (1) credit.
Through interactive lectures and group discussions in this course the basic concepts of evidence-based practice (EBP) required for advanced clinicians will be analyzed. The course is designed to bring students with the opportunity to develop and strengthen their knowledge about EBP. Students are expected to broaden their skills and incorporate an evidence-based attitude into clinical practice as a nurse anesthetist, using the seven-step model of EBP.

ENFE 7130 – Advanced Human Anatomy and Physiology. Three (3) credits.
The course provides an in-depth study of human anatomy and physiology while integrating the use of cadaveric dissections to provide students with a detailed knowledge on each body system. Special emphasis is directed towards the respiratory, central nervous, musculoskeletal, hepatobiliary, and gastrointestinal, renal, hematologic, and immune systems functions. Through lectures and group discussions, among other instructional strategies, the course prepares the student to understand and integrate future knowledge stemming from advanced pathophysiology, advanced pharmacology, basic and advanced principles of anesthesia. Thus, the student will amplify its capability of critical thinking and decision making as he/she gains further knowledge in the practice of nurse anesthesia.

ENFE 7131 - Advanced Pharmacology for Anesthesia I. Three (3) credits. Pre-requisites: ENFE 7028 - Chemistry, Biochemistry and Physics for Anesthesia
Through lectures and group discussions, among other instructional strategies, this course provides an in depth understanding of the pharmacokinetic and pharmacodynamics principles involved in the administration of pharmacologic agents. Anesthetics agents and adjuvants are studied to provide a thorough knowledge of each class of drug that include its physiochemical properties, mechanism of action at the cellular level, physiological effects, undesired side effects, interactions with other drugs and anesthesia considerations. Students incorporate the use of scientific evidence, ethical and legal standards into the decision-making process that involves administering any pharmacologic agent.

ENFE 7132 - Advanced Pathophysiology I. Three (3) credits.
The course provides a review of normal physiological mechanisms of specific body systems with an analysis of the etiology, pathogenesis, clinical progression, and manifestations of known pathologic processes. Through lectures and group discussions, among other instructional strategies, students will develop clinical knowledge of physiologic, and pathophysiologic processes to identify and analyze findings that serve as the foundations to build an anesthesia or pain management plan. Principles of cell physiology and transport mechanisms, genetic alterations, cancer, immunity, infections/inflammatory processes and pathophysiology of the cardiovascular, hematological, respiratory, central nervous system, and musculoskeletal disorders, are emphasized.

ENFE 7133 - Basics of Anesthesia I. Three (3) credits.
Through lectures and group discussions, among other instructional strategies, this course provides nurse anesthesia students with comprehensive and specialized study of basic anesthesia management skills, standard monitors, equipment's, and techniques that are essential to anesthesia practice. Students are acquainted with preoperative assessment of patients, anesthesia methods, techniques, and equipment, and airway management. Other areas discussed include; fluid and blood replacement, positioning, monitoring devices, and post-anesthesia care. The acquisition of basic skills is enhanced by the use of simulated laboratory experiences.

ENFE 7134 - Advanced Pathophysiology II. Three (3) credits. Pre-requisites: ENFE 7132 -Advanced Pathophysiology I
The course builds upon prior knowledge and leads students to an in-depth study of pathophysiologic mechanisms and disease processes. Students are expected to identify and analyze patient findings that serve

as the foundations to develop a care plan in providing anesthesia during the perioperative period. Emphasis is on the physiology and pathophysiology of renal, gastrointestinal, endocrine, reproductive, and the multiple organic dysfunction syndrome. The course uses interactive lectures, case study discussions, work group through media and simulation, and others. Correlation of laboratory studies/findings with clinical manifestations of diseases is integrated. The course is face-to-face.

ENFE 7235 - Advanced Pharmacology for Anesthesia II. Three (3) credits. Pre-requisites: ENFE 7131 - Advanced Pharmacology for Anesthesia I

The course builds upon prior knowledge to conduct an in-depth study of local anesthetics, muscle relaxant agents, and antagonists, vasoactive drugs, antiarrhythmics, psychopharmacologic agents, adjuvant drugs, and others. Students are required to search the scientific literature to find evidence on newer, safer, and cost-effective pharmacologic therapies being used for the management of the surgical and pain management patient. The course uses interactive lectures, groups discussions, problem-based learning, and others. The course is face-to-face.

ENFE 7236 - Advanced Health Assessment. Three (3) credits. Pre-requisites: ENFE 7130 – Advanced Human Anatomy and Physiology

The course provides students the opportunity to develop advanced knowledge and skills to perform a thorough health assessment of patients. Students practice collection of comprehensive health history, regional physical examination, preoperative assessment, and documentation of findings. The course uses interactive lectures, demonstrations, case study discussions, work group through media, and others. Simulated laboratory experiences are incorporated to enhance competency development. The course is face-to-face.

ENFE 7237 - Basics of Anesthesia II. Three (3) credits. Pre-requisites: ENFE 7133 - Basics of Anesthesia I

The course provides nurse anesthesia students with a thorough understanding of advanced clinical monitoring systems and its applicability. It integrates all relevant aspects pertaining to outpatient and office-based anesthesia. Students develop all pertinent knowledge and skills in the use of ultrasound guided anesthesia techniques for placement of invasive lines and peripheral nerve blocks. The study of hematologic system and anesthesia is also incorporated. The course analyzes the physiological and pathophysiological underpinnings of chronic and acute pain, and its management. Important complications related to anesthesia practice are discussed and subjected to critical analysis. The course uses interactive lectures, case study discussions, simulations and supervised laboratory practices, and others. The acquisition of all skills and knowledge is incorporated with the use of simulated laboratory experiences. The course is face-to-face.

ENFE 7238 - Clinical Practice I. One (1) credit. Pre-requisites: ENFE 7131-Advanced Pharmacology for Anesthesia I, ENFE 7133 - Basics of Anesthesia I

Nurse anesthesia students are introduced to the clinical practice setting to enable the development of basic skills and techniques in the preoperative evaluation of the patient, anesthesia machine check, table-top preparation, patient positioning, maintenance of normothermia, airway management, perioperative and post-operative care. Students apply the knowledge and techniques with the surgical patient on their clinical training sites, while maintaining patient safety and use of critical thinking skills. The course uses self-evaluations, anesthesia care plans, formative assessment sessions, and others. Students practice with the direct supervision of the CRNA or MDA clinical preceptor and/or course instructor. The course is face-to-face on the clinical training sites.

ENFE 7239 - Clinical Practice II. Four (4) credits. Pre-requisites: ENFE 7238 - Clinical Practice I

The student engages in the pre-operative, intraoperative and postoperative care of the surgical patient. Development of critical thinking and clinical judgement is employed during the induction and maintenance of general and regional anesthesia, and monitored anesthesia care. The student is expected to manage

patients with minimal comorbidities within the general surgery population, acute and chronic pain. The course uses self-evaluations, anesthesia care plans, problem-based learning, formative assessment sessions, and others. Clinical correlational conferences are integrated to enhance student learning. Students practice with the direct supervision of the CRNA or MDA clinical preceptor and/or course instructor. The course is face-to-face on the clinical training sites.

ENFE 7240 – Nursing Theories, Professional and Legal Aspects of Nurse Anesthesia Practice. Three (3) credits.
The course provides the student with comprehensive knowledge on all relevant aspects that govern advanced practice nursing with emphasis on nurse anesthesia. The theoretical foundation and history of nurse anesthesia practice are incorporated as an important pillar of weighing on the value of the profession. Also, the standards and scope of practice, ethical guidelines, professional attributes, and legal and regulatory parameters among other relevant aspects are incorporated as part of the course. The course uses interactive lectures, group discussions, role play, conceptual maps, and others. The course is face-to-face.

ENFE 7241 - A Team-Based Practice Approach to Healthcare Seminar. One (1) credit.
The seminar engages students in the utilization of a team-based approach to providing healthcare. The evidence-based underpinnings are examined and discussed with students. Students are expected to acquire the necessary tools to develop expert knowledge using the Team Strategies and Tools to Enhance Performance and Patient Safety Model (TeamSTEPPS). The course uses interactive lectures, case study discussions, role play, and others. The course may be offered in any of the following modalities: face-to-face, hybrid or online.

ENFE 7251 - Advanced Principles of Anesthesia I. Two (2) credits. Pre-requisites: ENFE 7237–Basics of Anesthesia II
This course is designed to enhance the student's basics foundation in anesthesia and the development of critical thinking skills. It will provide the student with an in-depth coverage of anesthesia management for extrathoracic, ophthalmic, otorhinolaryngology, maxillofacial, trauma, hepatobiliary and gastrointestinal procedures. The student will be able to plan the anesthetic care for burn patients and also for those requiring orthopedic and laparoscopic procedures. This course will foster communication, teamwork, and knowledge to protect patient safety. The course uses lectures, group discussions, case analysis, simulation, and others. The course is face-to-face.

ENFE 7252 - Advanced Principles of Anesthesia II. Three (3) credits. Pre-requisites: ENFE 7251 -Advanced Principles of Anesthesia I
The course seeks to increase and apply the students' knowledge of advanced courses, basic anesthesia physiology and clinical practice in offering anesthesia delivery care. It examines anesthetic management and considerations for patients with pathophysiologic disruptions requiring surgical interventions in the cardiac, vascular and respiratory systems. Considers communication and teamwork to assure continuity of care and patient safety. Conferences emphasize problem-based learning (PBL) allowing the student to integrate advanced physiology and nurse anesthesia knowledge, skills, and critical thinking. The course also uses group discussions, simulation, skills laboratories, case analysis, and others. The course is face-to-face.

ENFE 7253 - Clinical Practice III. Three (3) credits. Pre-requisites: ENFE 7239 - Clinical Practice II
Students actively participate and lead the provision of anesthesia during the perioperative phases of patients undergoing neurosurgical, musculoskeletal, endocrine, renal, and urological surgical procedures. Also, the administration of anesthesia for therapeutic and diagnostic procedure. They apply knowledge related to anesthetic agents, adjuvants, techniques, positioning, delivery systems, anesthesia care plan and manage anesthesia complications to ensure patient safety. The course uses student' self-evaluations, on-call experiences, anesthesia care plans, review of clinical cases and others. Students practice with the direct

supervision of the CRNA or MDA clinical preceptor and/or course instructor. The course is face-to-face on the clinical training sites.

ENFE 7254 - Clinical Practice IV. Three (3) credits. Pre-requisites: ENFE 7253 - Clinical Practice III
Students use clinical judgment application and decision-making in the development of skills with patients undergoing anesthesia for thoracic, cardiothoracic, vascular, and endovascular surgical procedures. Anesthesia is provisioned while the patient is under the use of extracorporeal circulation or the use of one lung ventilation techniques. Considers anatomical, physiological, and pathophysiological aspects of special patient populations (obstetric, pediatric, neonatal, obese, and geriatric) into the anesthesia care plan. The course uses student' self-evaluations, on-call experiences, anesthesia care plans, review of clinical cases and others. Nurse anesthesia students train under the direct supervision of the CRNA or MDA clinical preceptors and/or course instructor. The course is face-to-face on the clinical training sites.

ENFE 7255 - Healthcare Policies. Three (3) credits.
The course will allow the graduate student to explore foundations of creating and/or modifying healthcare policies that shape the landscape for how patients and providers interact with the healthcare system. The student will understand how lawmakers and organizations are influenced into creating and/or modifying health policies. In addition, the students will be able to evaluate health practices and policies in various contexts, design methods and lobbying strategies that promote health policy changes. The course uses interactive lectures, group discussions, conceptual maps, role-playing, and others. The course is face-to-face.

ENFE 7256- Informatics and Health Technologies. Three (3) credits.
The course will allow the student to understand the significance of nursing informatics to advance the care of patients, communities, and populations, influencing the state of health and well-being of human beings. They will increase capabilities informatic management, clinical information systems, and provision of evidence-based decision-making and in what way it changes the healthcare delivery systems. In addition, the standard of nursing informatic services, ethical-legal aspects, and policies related to the use of informatics technology in health systems. The uses conferences, simulation, discussion of readings, and others. The course may be offered in any of the following modalities: face-to-face, hybrid or online.

ENFE 7257 – DNP Evidence-Based Practice Project I. Three (3) credits. Pre-requisites: ENFE 7027 - Applied Biostatistics, ENFE 7029 – Evidence-Based Practice Principles, ENFE 7251 - Advanced Principles of Anesthesia I
In this course, students are required to identify a clinical, administrative, or academic situation for the development of a project based on scientific evidence under the supervision of faculty. The tools for the development of a proposal are provided, integrating the steps of the evidence-based practice (EBP) model. The course uses lectures, assignments, group work, tutorial sessions and others. The course is face-to-face.

ENFE 7258 - Anesthesia for Special Populations. Three (3) credits. Pre-requisites: ENFE 7251 –Advanced Principles of Anesthesia I
The course leads nurse anesthesia students to develop critical thinking and evidence-based knowledge needed to provide safe nurse anesthesia care for special populations including pregnant women, neonates, pediatrics, elderly, and the obese population. Physiologic and pathophysiologic differences that affect the anesthetic plan, pharmacokinetics and pharmacodynamics are discussed in relation to each population. In addition, the student is led to devise appropriate interventions for prevention and management of anesthesia complications. Simulated laboratory experiences, lectures, and problem based learning are used to enhance student learning. The course is face-to-face.

ENFE 7300 - Advanced Principles of Anesthesia III. Two (2) credits. Pre-requisites: ENFE 7252 -Advanced Principles of Anesthesia II
This course provides nurse anesthesia students the opportunity to enhance concepts related to surgical procedures of the central nervous, neuroskeletal, endocrine and renal system. It integrates anatomical, physiological, and pathophysiological considerations of regional anesthesia and its techniques. The course emphasizes neuropathophysiology, peripheral nervous system and neuroanesthesia. It also includes renal, endocrine, and musculoskeletal pathophysiology and anesthesia management. Effective communication and teamwork are included to assure continuity of care and patient safety. Evidence-based techniques and best practices related to safe management for patients undergoing these procedures will be integrated. The course also uses group discussions, simulation, skills laboratories, case analysis, and others. The course is face-to-face.

ENFE 7900 - Comprehensive Nurse Anesthesia Examination. Cero (0) credits. Pre-requisites: Approval of the courses of the first two years of the program.
This course is designed to ensure that the nurse anesthesia student undergoes a comprehensive evaluation process that assesses the knowledge acquired by the student throughout the program. The student is provided with 30 hours of independent study and is expected to work on consolidating knowledge and improving knowledge gaps. The student is then exposed to a comprehensive nurse anesthesia examination to demonstrate mastery of content. Examination approval is a prerequisite for the start of the first residence established in the curriculum of the program.

ENFE 7260 - Clinical Practice V. Three (3) credits. Pre-requisites: ENFE 7254 - Clinical Practice IV
Students actively participate and lead the provision of anesthesia during the perioperative phases of patients undergoing hepatobiliary, gastrointestinal, eyes, ears, nose and throat, maxillofacial and other important surgical procedures such as laparoscopic surgery, orthopedic trauma, and critical care. Students are allowed to participate in the perioperative period with direct supervision of CRNA or MDA clinical preceptors.

ENFE 7262 – DNP Evidence-Based Practice Project II. Three (3) credit. Pre-requisites: ENFE 7257 - DNP Evidence-Based Practice Project I
This course is designed for students doctor of nursing practice in anesthesia to translate scientific evidence into practice and the evaluation and improvement of nurse anesthesia practice and outcomes. Students will also disseminate project outcomes to stakeholders and relevant communities.

ENFE 7400 - Healthcare Finance and Economics. Three (3) credits.
The course provides nurse anesthesia students with the financial knowledge, to actively participate and lead needed economic changes in healthcare systems and organizations. It analyzes business aspects of the advanced nursing practice profession, that involve financing, billing, planning, financial statements, and insurance policies among other aspects. The course uses interactive lectures, group discussions, problem-based learning, and others. The course is face-to-face.

ENFE 7261 - Anesthesia Residency I. Five (5) credits. Pre-requisites: ENFE 7260 - Clinical Practice V
Clinical course in which the nurse anesthesia students have the opportunity to incorporate all the knowledge acquired into anesthesia practice with patients undergoing different surgical procedures and pertaining to different surgical populations. The student should solidify psychomotor skills for placement of regional anesthetics with the use of ultrasonography. Students practice anesthesia procedures and techniques related to all phases of anesthesia delivery. The nurse anesthesia student must function under indirect supervision of the clinical preceptor as an advanced practitioner in collaboration with the health clinical team. Clinical correlations conferences are integrated.

ENFE 7301 Nurse Anesthesia Review. Three (3) credits. Pre-requisites: Approval of all preceding courses.
The course is designed to provide a comprehensive review of the content knowledge required to enter nurse anesthesia practice. Specifically, the course covers content in anatomy, physiology and pathophysiology by system, pharmacology for anesthesia, applied chemistry, biochemistry and physics, equipment, instrumentation and technology related to anesthesia practice, monitoring devices, general principles of anesthesia, anesthesia for surgical procedures and special populations. The student is provided with 30 hours of independent study and is expected to work on consolidating knowledge and improving knowledge gaps. The student is required to demonstrate mastery of content with the approval of a comprehensive nurse anesthesia examination.

ENFE 7263 - Anesthesia Residency II. Five (5) credits. Pre-requisites: ENFE 7261-Anesthesia Residency I
Nurse anesthesia students function as advanced practitioners applying clinical competencies related to all phases of anesthesia delivery. Clinical performance focuses on perioperative interventions with patients undergoing all types of surgery and utilizing different types of general, regional and local anesthesia methods. Clinical correlation conferences are integrated. Students are provided with flexibility to solidify or strengthen knowledge in their area of preference.

GRADUATE COURSES

DOCTOR OF PHILOSOPHY IN NURSING (PhD)

ENFE 8005 - Philosophy of Nursing Science. Three (3) credits.
Introduction to concepts of philosophy and science. Analysis of nursing philosophy, nursing science, and philosophy of nursing science. Study of philosophical traditions in nursing science. Review of selected philosophers that influenced science and knowledge development. Study of the epistemology, ontology, and ethics in nursing. Analysis of ways of knowing in nursing and development of knowledge. The course will be taught using hybrid modality.

ENFE 8007 - Qualitative Research Methods. Three (3) credits.
This course is geared towards the study of qualitative methodology with an inductive focus used to generate knowledge from human experience in different health and illness situations, as well as from nursing practice and models. Philosophical and psychological underpinnings of qualitative research paradigm which underlie ethnographic, phenomenological, case study, historiography and emerging or grounded theory design will be analyzed. Also, the student must apply the bioethical principles that guide the trustworthiness of qualitative research to protect the human rights of participants. The course will be taught using hybrid modality.

ENFE 8008 - Quantitative Research Methods. Three (3) credits. Pre-requisites: ENFE 8011, ENFE 8012.
The philosophical and psychological underpinnings of non-experimental and experimental quantitative research will be analyzed. This course focuses on research designs, data collection procedures, measurement, and statistical analysis. Emphasis is given to the critical analysis and the scientific rigor of the quantitative research designs. Through conferences, epistemological dialogues and critical analysis of concepts, students will achieve a conceptual, theoretical understanding of the quantitative paradigm, and ethical implication in each step of quantitative research. The course will be taught using hybrid modality.

ENFE 8009 - Theories of Nursing Science. Three (3) credits. Pre-requisites: ENFE 8005.
This course integrates hybrid modality to prepare doctoral students in the study of nursing theories, their historical evolution, philosophical underpinnings, and the epistemological contribution to the discipline. The course includes concept analysis, methods, and application. Students will be encouraged to critically think

towards the development, use, and evaluation of nursing theories in research and practice. Issues and future trends in the development of nursing theories are explored.

ENFE 8010 - Guided Study: Development and Validation of Research Instruments. Two (2) credits. Pre-requisites: ENFE 8009, ENFE 8012. Co-requisites: ENFE 8008.
This course will give the students the opportunity to study measurement theories. Students will be exposed to a set of experiences related to the inductive and deductive process for constructing and testing instruments. Issues pertaining to the construction of instruments, development and use of scales, tests, inventories and the importance of conducting pilot studies for validation and reliability will also be discussed. Students will develop or evaluate an instrument that measures one of the constructs related to their research interest and will submit it to validation and reliability testing. The course will be taught using hybrid modality.

ENFE 8011 - Biostatistics for Nursing Research I. Three (3) credits.
This course focuses primarily on the application of inferential statistics to nursing research. Both descriptive and inferential statistical concepts and principles will be discussed through lectures and practice exercises. Statistical software will be used to assess associations between variables through parametric and non-parametric tests, as well as inference statistical tests for categorical variables. The course will be taught using hybrid modality.

ENFE 8012 - Biostatistics for Nursing Research II. Three (3) credits. Pre-requisites: ENFE 8011.
This is the second part of the Biostatistics for Nursing Research course. This course will emphasize in more advanced statistics, including the extended forms of analysis of variance, a variety of regression models and survival analysis, through lectures and practice exercises. Statistical software will be used to assess associations and the magnitude of associations between variables. The course will be taught using hybrid modality.

ENFE 8016 - Guided Research I. Four (4) credits. Pre-requisites: ENFE 8007, ENFE 8008, ENFE 8010.
In this course, the student will identify a research problem that can be studied using a deductive or inductive approach. Students will organize and present the knowledge gained through literature review of what is known about their research problem. The student will select a theoretical model that can help answer their research questions. The course will be taught using hybrid modality.

ENFE 8017 - Independent Study. Three (3) credits.
This course provides the student the opportunity to work independently in order to develop a scholarly work in an area of research interest under the supervision of a faculty assigned to the course. Among the activities to be performed, the student can select: secondary analysis with information from a database, review of the literature of a phenomenon of interest or instrument validation.

ENFE 8018 - Development of the Role of Nursing as a Researcher. Three (3) credits.
This course gives students the opportunity to analyze options and settings where they may perform the role of a nurse researcher once they have completed the doctoral program. The students will be able to plan his/her research career trajectory by establishing short and long term goals and objectives as well as the specific strategies to achieve them. They will also evaluate the relevancy of research in the inter-professional context. Students will be exposed to diverse methods of dissemination of research findings, including the preparation of abstracts and poster presentations for scientific forums, and manuscript writing to publish in peer-reviewed journals. Students will also perform searches for external funding utilizing formats established by various government and private organizations and foundations. The course will be taught using hybrid modality.

ENFE 8019 - Special Topics in Research. Variable, one (1) to three (3) credits per semester, up to a maximum of 6 credits.
This elective course will be offered by special agreement between the nursing doctoral student and his mentor who will supervise or direct the student. The student will compromise to do an independent study related with his phenomenon of interest or research methodology. It may include attendance at conferences, short course, guided readings, discussions, or research's residence, among others. A minimum of 24 hours is required for each credit.

ENFE 8025 - Seminar: Nursing Science and Public Policy. Two (2) credits.
In this seminar, students will analyze and deliberate about advancements in nursing science from a scientific knowledge and social recognition perspective. Students will analyze the role of nursing in the development of policies in the areas of service providing, work setting, government, organizations and the community. The social, economic, legal, bioethical and technological impact on health policy from a local, national and global perspective will be studied. It is expected that students will develop a public policy project that can be presented in the appropriate forums. The course will be taught using hybrid modality.

ENFE 8026 - Guided Research II. Four (4) credits. Pre-requisites: ENFE 8016, ENFE 8027.
Students through independent studies, mentoring, and seminars will design the methodology of their research proposal that adheres to qualitative, quantitative, or mixed-method standards. In this course, students will select their Dissertation Committee and will also take the comprehensive exam. The course will be delivered using hybrid modality.

ENFE 8027 -Mixed Methods Research. Three (3) credits. Pre-requisites: ENFE 8007, ENFE 8008.
This course focuses on the mixed method research to address research questions employing the combination of both quantitative and qualitative approaches. A theoretical understanding of mixed method will introduce students in the philosophical assumptions and components of mixed method procedures to explore and explain complex phenomena in nursing and health care scenarios. This approach will provide students the opportunity to develop an innovative research design that will contribute to a comprehensive understanding of the phenomenon of interest. The course will be delivered using hybrid modality.

ENFE 8990 - Doctoral Dissertation I. Four (4) credits. Pre-requisites: ENFE 8026, Approved Comprehensive Test.
This course is designed with the purpose to bring students with the opportunity to continue developing the knowledge, skills and attitudes necessary to become a nursing scientist. Through the advisement of their Dissertation Committee, students are expected to be prepared to orally defend their research proposal and submit it to the Institutional Review Board (IRB) and other relevant boards for their approval as required. The course will be delivered using hybrid modality.

ENFE 8991 - Doctoral Dissertation II. Four (4) credits. Pre-requisites: ENFE 8990.
This course is designed with the purpose to bring students with the opportunity to continue developing the knowledge, skills, and attitudes necessary in order to implement their research study. Students will conduct their research study including, data collection and analysis, synthesis of data, and making the appropriate extrapolations. The course will be delivered using hybrid modality.

ENFE 8992 - Doctoral Dissertation III. Four (4) credits. Pre-requisites: ENFE 8991.
The course is designed to provide the student with the opportunity to continue developing the knowledge, skills, and attitudes necessary to become a nursing researcher. In this course, the student is expected to complete the dissertation document that will include the discussion of the study findings and conclusions, as

well as the contributions that the study represents for theory, practice, and nursing science. Then, the student will orally defend his dissertation. The course will be delivered using hybrid modality.

DIVISION OF CONTINUING EDUCATION AND PROFESSIONAL STUDIES COURSES

ENFE 0155 - Critical Care to Patients with Neuroendocrine Alterations. Three (3) credits.
In this course, the student develops skills to apply the nursing process with a holistic approach in the management of critically ill patients with endocrine disturbances and their family. Anatomy and physiology of the neurological and endocrine systems is discussed as well as the diagnosis, etiology, pathophysiology, treatment and nursing interventions for endocrine conditions. This course includes clinical practice in specialized neurosurgical (acute and moderate) and medical surgical intensive care units.

ENFE 0156 - Advanced Pathophysiology. Four (4) credits.
This course is an in-depth study of the pathophysiology of disease. The students will analyze the basic concepts of pathophysiology and the consequences of pathologic processes on the structure and function of the human body. It provides the students exposure to the concepts of pathophysiology, identification of acute and chronic diseases, as well as the treatment will be discussed. The content of this course will include the cell, genetics, mechanisms of self-defense, cellular proliferation: cancer, and alteration in organs and systems including multiple interacting systems.

ENFE 0170 - Nursing Assessment of Cancer Patients. Six (6) credits.
This course is geared to analyze the scientific bases necessary to perform the nursing role in assessing health status of cancer patients. The processes of normal cell changes and adaptation as well as damages are analyzed. Evolution of cancer, pathophysiology and clinical aspects for diagnosis are studied. Topics related to professional oncology nursing are considered. Emphasis is placed on the nurses' role in performing health history and physical examination in order to evaluate health status of cancer patients. This course includes a clinical practice that is carried out in oncology units.

ENFE 0171 - Nursing Care of Cancer Patients. Six (6) credits. Pre-requisites: ENFE 0170.
In this course, the student acquires the knowledge and advanced skills to provide nursing care to cancer patients. Nursing role in the administration of cancer chemotherapy, pain management, ethical issues related to the end of life, quality of life, suffering and affliction is analyzed. Nursing interventions for most common types of cancer and their complications are studied. This course includes clinical practice that is carried out in oncology units.

ENFE 0187 - Advanced Pharmacology. Four (4) credits.
This course provides for an in-depth study of the pharmacology of drugs. It is designed to prepare clinical nurse specialists (CNS) in a collaborative role with the physician, to accurately describe, administer, and counsel patients regarding appropriate and safe drug therapy. In addition clinical nurse specialists will be prepared to prescribe medications within their scope of practice. Basic pharmacologic principles for common primary care disorders and the pharmacologic actions of the major drug classes will be discussed in relation to physiologic systems, with emphasis on the application of these agents.

ENFE 0275 - Critical Care to Patients with Cardiorespiratory Alterations. Four (4) credits.
This course is designed to develop skills for the assessment, diagnosis, planning, implementation and evaluation of nursing interventions including the bio-psycho-social and spiritual aspects of the patient with cardio respiratory disturbances and the impact to the family unit. It emphasizes health promotion, maintenance and restoration of health considering ethical-legal aspects. Anatomy and physiology of the cardiovascular and respiratory systems are studied from health and disease standpoints. This course includes

clinical practice in specialized critical care units, such as intensive coronary, post-surgery intensive care, and intensive medical-surgical units.

ENFE 0365 - Critical Care of Patients with Gastrointestinal and Renal Alterations. Three (3) credits.
This course is designed to develop skills for the assessment, diagnosis, planning, implementation and evaluation of nursing interventions using a holistic approach geared to the management of critically ill patients with gastrointestinal and renal disturbances and their families. Anatomy and physiology of the gastrointestinal and renal systems from health and illness standpoints are discussed. This course includes clinical practice in critical care units such as post-surgical intensive and medical surgical intensive care units.

ENFE 0455 - Nursing Care of Patients with Immunology, Integumentary Disturbances, Trauma and Complications at Intensive Care Unit (ICU). Four (4) credits.
In this course, the student develops skills to apply the nursing process in the management of critical care patients with disturbances of the immunology and integumentary systems. Nursing interventions in patients with trauma and complications (such as: shock, intoxication, and high-risk pregnancy) including bio-psycho-social and spiritual aspects will be discussed. This course includes clinical practice in critical intensive care units, trauma and burn units.

Faculty

ALICEA-AVILA, MELANY - *Instructor*; MSN, 2012, University of Puerto Rico - Medical Sciences Campus - Puerto Rico.

ALMENAS-HERNÁNDEZ, MARTA N. - *Associate Professor*; EdD, 2022, Inter American University, Metropolitan Campus - Puerto Rico.

APONTE-REYES, LINNETTE - *Assistant Professor*; EdD, 2017, Nova Southeastern University-Puerto Rico Campus - Puerto Rico.

ARROYO-NOVOA, CARMEN MABEL - *Professor*; PhD, 2010, University of California – California.

BONILLA GARCÍA, JOSÉ L. - *Assistant professor*; DNAP, 2020, Texas Wesleyan University - Fort Worth Texas.

CAMACHO-RIVERA, LUZ V. - *Associate Professor*; EdD, 2017, Nova Southeastern University-Puerto Rico Campus - Puerto Rico.

CASTRO-LABOY, MARÍA I. - *Professor*; PhD, 1992, Ponce School of Medicine - Puerto Rico.

CÁTALA-TORRES, IRIS W. - *Counselor IV*; PsyD, 2010, Carlos Albizu University - San Juan Campus - Puerto Rico.

CUSTODIO-ORTIZ, CARMEN A. - *Associate Professor*; EdD, 2014, Inter American University, Metropolitan Campus - Puerto Rico.

DÁVILA-ORTIZ, NANCY - *Professor*; PhD, 2010, The University of Arizona - Arizona.

DÍAZ-COLÓN, CARMEN I. - *Associate Professor*; EdD, 2016, Nova Southeastern University-South Florida Campus - Florida.

DÍAZ-ORTIZ, EMANUEL E. - *Assistant Professor*; DHA, 2023, University of Phoenix - Arizona.

DÍAZ-RAMOS, NOEMY - *Associate Professor*; EdD, 2017, Nova Southeastern University-Puerto Rico Campus - Puerto Rico.

DÍAZ-SANTIAGO, BEATRIZ N. - *Assistant Professor;* PhD*,* 2019*,* Ana G. Méndez University-Cupey Campus - Puerto Rico.

FIGUEROA-HERNÁNDEZ, LEYRA - *Professor*; PhD, 2020, Ana G. Méndez University-Cupey Campus - Puerto Rico.

FIGUEROA-RAMOS, MILAGROS I. - *Professor*; PhD, 2010, University of California – California.

FLORES-RODRÍGUEZ, MILDRED - *Professor*; PhD, 1994, Walden University - Minnesota.

GONZÁLEZ BRAVO, MARIANA - *Instructor*; MSN, 2020, University of Puerto Rico - Medical Sciences Campus - Puerto Rico.

GUADALUPE ÁLAMO, MYRIAM J. - *Assistant Professor*; PhD, 1996, Temple University - Philadelphia.

HERNÁNDEZ-ROBLES, LILLIANA - *Associate Professor*; PhD, 2019, Ana G. Méndez University-Cupey Campus - Puerto Rico.

HERNÁNDEZ VÉLEZ, JORGE L. - *Assistant Professor*; DNAP, 2018, Texas Wesleyan University - Fort Worth Texas.

IRENE-LÓPEZ, LOURDES C. - *Associate Professor*; PhD, 2020, UMass Amherst - Massachusetts.

ORTIZ-COTTO, JOSMARIE – *Assistant Profesor*; DNS, 2021, University of Puerto Rico - Medical Sciences Campus - Puerto Rico.

ORTIZ-PADILLA, ELBA N. - *Assistant Professor*; MSN, 1995, University of Puerto Rico - Medical Sciences Campus - Puerto Rico.

PEREIRA-MORALES, SHERILY - *Associate Professor*; PhD, 2016, UMass Amherst - Massachusetts.

REGUEIRA-ÁLVAREZ, YADIRA R. - *Professor*; PhD, 2004, University of Massachusetts - Massachusetts.

RIVERA FUENTES, MARIBELIS - *Instructor*; MSN, 2018, University of Puerto Rico - Medical Sciences Campus - Puerto Rico.

RIVERA PÉREZ, JENNIFER – *Assistant Professor*; DNP, 2022, UMass Amherst – Massachusetts

RIVERA-RODRÍGUEZ, IVELISSE - *Associate Professor*; EdD, 2017, University of Puerto Rico – Río Piedras Campus - Puerto Rico.

RIVERA-ROSA, LEONOR M. - *Assistant Professor*; MSN, 2014, University of Puerto Rico - Medical Sciences Campus - Puerto Rico.

RODRÍGUEZ-RODRÍGUEZ, JANET - *Professor*; PhD, 2009, The University of Arizona-Arizona.

ROMÁN HERNÁNDEZ, FÉLIX J. - *Assistant Professor*; DNP, 2022, UMass, Amherst - Massachusetts.

ROMÁN-RIVERA, ELIZABETH - *Professor*; EdD, 2012, Inter American University, Metropolitan Campus - Puerto Rico.

ROMÁN-SANTIAGO, CRISTIAN R. - *Instructor*; MSN-SA, 2022, University of Puerto Rico - Medical Sciences Campus - Puerto Rico.

RUIZ-LEBRÓN, ROSA B. - *Assistant Professor*; MSN, 1996, University of Puerto Rico - Medical Sciences Campus - Puerto Rico.

SEGUÍ-RODRÍGUEZ, ASTRID G. - *Associate Professor*; EdD, 2023, Nova Southeastern University - Fort Lawderdale Campus - Florida.

SOTO-SANTIAGO, JUAN C. - *Professor*; EdD, 2009, Inter American University, Metropolitan Campus - Puerto Rico.

TORRES-REYES, VIVIANA - *Instructor*; DHA, 2024, University of Phoenix - Arizona.

VÁZQUEZ SANJURJO, IRMA D. - *Assistant Professor*; MSN, 2012, University of Puerto Rico - Medical Sciences Campus - Puerto Rico.