

**PhD in the Pharmaceutical Sciences Program**  
**PHARMACEUTICS AND DRUG DELIVERY TRACK**

The Pharmaceutics and Drug Delivery track focuses on the design, development, and optimization of dosage forms for small and large molecule drugs. Process development of Quality by Design (QbD) manufacturing procedures, combined with advanced Process Analytical Technologies (PAT) has become highly relevant to the pharmaceutical industry. Research will be carried out in materials sciences, nanotechnology, crystallization, and drug formulation. It also involves the application of physical and analytical chemistry, and engineering towards development of novel drug delivery systems. This track is directed towards students that are interested in modern manufacturing methods of active pharmaceutical ingredients and novel formulation approaches to final drug products.

**FIRST YEAR**

FIRST SEMESTER		SECOND SEMESTER	
<i>Course</i>	<i>Credits</i>	<i>Course</i>	<i>Credits</i>
PHSC 8516 Principles of Pharmaceutical Sciences	3	PHSC 8338 Business, Quality and Project Management	3
PHSC 8236 Applied Biostatistics	3	PHSC 8116 Advanced Instrumental Analysis	3
PHSC 8447 Principles of Drug Discovery and Development	3	PHSC 8602 Seminar II	1
PHSC 8425 Laboratory Rotation	1	PHSC 8335 Ethics in Research	2
PHSC 8602 Seminar I	1	PHSC 8601 Research	3
<b>Total credits</b>	<b>11</b>	<b>Total credits</b>	<b>12</b>

**SECOND YEAR**

FIRST SEMESTER		SECOND SEMESTER	
<i>Course</i>	<i>Credits</i>	<i>Course</i>	<i>Credits</i>
PHSC 8016 Advanced Biopharmaceutics & Pharmacokinetics	3	PHSC 8517 Regulatory and Manufacturing Practice	3
PHSC 8427 Pharmaceutical Engineering and Unit Operations	3	PHSC 8436 Pharmaceutical Formulation and Drug Delivery	3
PHSC 8602 Seminar III	1	PHSC 8602 Seminar IV	1
PHSC 8600 Principles of Research Design	2	PHSC 8601 Research	3
PHSC 8601 Research	3	Elective	3
<b>Total Credits</b>	<b>12</b>	<b>Total Credits</b>	<b>13</b>

**THIRD YEAR**

FIRST SEMESTER		SECOND SEMESTER	
<i>Course</i>	<i>Credits</i>	<i>Course</i>	<i>Credits</i>
PHSC 8601 Research	3	PHSC 8601 Research	3
<b>Total Credits</b>	<b>3</b>	<b>Total Credits</b>	<b>3</b>

**FOURTH YEAR**

FIRST SEMESTER		SECOND SEMESTER	
<i>Course</i>	<i>Credits</i>	<i>Course</i>	<i>Credits</i>
PHSC 8601 Research	3	PHSC XXXX Thesis	3
<b>Total Credits</b>	<b>3</b>	<b>Total Credits</b>	<b>3</b>