

<p>1. Ph.D. in Pharmaceutical Sciences (Pharmaceutics): Drug delivery I</p>	0901801	3 hours	-	3 hours	<p>The course aims to provide the students with in-depth updated knowledge of the physicochemical and biological principles of novel drug delivery systems introduced over the past decade with emphasis on the area of pharmaceutical nanotechnology. The course also aims to develop the students' knowledge in research methodologies and techniques encountered in the development, fabrication and in vitro/in vivo evaluation of various small molecule drug nanocarriers encompassing vesicular, polymeric, and metal based delivery systems.</p>
Drug delivery II	0901803	1.5 hours	1.5 hours	3 hours	<p>The course aims to provide the students with in-depth knowledge of advances in drug delivery systems and targeting approaches in general with emphasis on macromolecular therapeutics including peptide and protein drugs. Special physical, chemical, and biopharmaceutical considerations in the formulation and characterization of advanced drug delivery systems involving polymers and macromolecules are covered.</p>
Advances in Transdermal Drug Delivery	0901807	3 hours	-	3 hours	<p>The course aims to provide the students with in-depth knowledge of various novel drug delivery systems for effective delivery of drug into, or</p>

					<p>across, the skin taking into consideration special skin barrier characteristics to be overcome as well as challenging physical, chemical, and biopharmaceutical limitations of the drug. The course also aims to develop the students' skills in research methodologies and techniques currently used in the development, and in vitro/in vivo characterization of drug delivery systems for topical delivery.</p>
<p>Biomedical research techniques related to pharmaceutical research</p>	0901808	3 hours	-	3 hours	<p>The aim of this course is to provide knowledge of the principles, scope and applications of various types of biomedical techniques commonly used in modern pharmaceutical and drug delivery research and to develop the laboratory skills required to use these techniques in research. The course will cover appropriate experimental design, data presentation and analysis in each technique. Emphasis is placed on tissue culture, imaging (e.g. electron microscopy, AFM, confocal microscopy, flow cytometry), proteomics (e.g. SDS-PAGE gel electrophoresis, mass spectrometry, recombinant protein expression and purification), molecular biology (PCR, cloning, transfection and protein expression), clinical biochemistry (immunoassays, cytotoxicity assays) and</p>

					genomics (real time RT-PCR).
Drug targeting within the gastrointestinal tract	0901805	3 hours	-	3 hours	The course aims to provide the students with in-depth knowledge of various approaches suggested for drug targeting within the gastrointestinal tract, taking into consideration site-specific limitations and potentials as well as challenging physical, chemical, and biopharmaceutical limitations of the drug. The course also aims to develop the students' skills in research methodologies and techniques currently used in this important area of pharmaceutical research.
Periodontal drug delivery	0901806	3 hours	-	3 hours	The course aims to provide the students with in-depth knowledge of various approaches suggested for periodontal drug delivery, taking into consideration site-specific limitations and potentials as well as challenging physical, chemical, and biopharmaceutical limitations of the drug. The course also aims to develop the students' skills in research methodologies and techniques currently used in this important area of pharmaceutical research.
Seminar I	0901802	-	3 hours	3 hours	The course aims to supply the students with skills of searching about new topics in the field of modern pharmaceuticals research in areas related to the topics discussed in the PhD

					<p>pharmaceutics courses., use up-to-date tools in retrieving information from proper sources of scientific information as PubMed or other data bases, know how to access relevant full articles and apprehend them, gain skills of preparing a referenced scientific report, and finally present the information compiled in a clear and comprehensive way for an audience of the teaching staff in the department and answer their inquiries.</p>
Seminar II	0901804	-	3 hours	3 hours	<p>This three-credit course is meant to be a continuation of Seminar I course. It would provide students effective practice speaking in front of an audience and to explore topics of their own choosing in detail. Students will research topics and organize presentations for faculty and other students. The topics must be an advanced and specific topic related to pharmaceutical sciences and formulation technology and must be approved by the instructor in advance.</p>