

Department	Pharmacy
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Course Name	Pharmaceutical Biotechnology	Course No.	201545
Prerequisite	Pharmaceutical Technology	Credit Hours	3
Number & date of course plan approval	2010-2011	Brief Description	See form QF02/0409

Course Objectives	The course is intended to provide the students with the basic information regarding pharmaceutical biotechnology topics. Pharmaceutical biotechnology advances during the past twenty years and their effects on drug discovery and biopharmaceutical production and formulation.
Intended Learning Outcomes	At the end of the course, the students are expected to <ol style="list-style-type: none"> 1. Understand the basics of DNA, RNA, proteins, central dogma and the regulation levels in differentiated cells. 2. Know the skills and techniques used recombinant DNA technology. 3. Determine the challenges of purification, formulation and delivery of biopharmaceuticals 4. Understand the advances of molecular biotechnology tools and bioinformatics and their use in the identification of the molecular basis of diseases discovering new drug targets. 5. Understand the effect of genetic variations (pharmacogenomics) on drug metabolism, efficacy of drugs and their toxicity 6. Have knowledge in the future applications of pharmaceutical biotechnology in treating genetic diseases
Course Topics	<ol style="list-style-type: none"> 1. DNA, RNA and proteins 2. Recombinant DNA technologies. 3. Drug discovery using biotechnology techniques. 4. Gene therapy. 5. Delivery of Biopharmaceuticals. 6. Pharmacogenomics and the effect of SNPs on drug metabolism
Text Books	Pharmaceutical Biotechnology: Concepts and Applications Gary Walsh, 2007
References	<ol style="list-style-type: none"> 1. Pharmaceutical Biotechnology. <i>O. Kayser and R.H. Muller. 2004</i>

Grade Determination	1 st Exam = 25% 2 nd Exam = 25% Final Exam = 50%	Practical Course Grade Determination	Course Work = 50% (Reports, Term Papers, Quizes) Final Exam = 50%	
Course Outline				
Week	Hours	Subjects	Chapters in Textbook	Notes
1 st	1 1 1	Introduction - Important terms in Biotechnology - Prokaryotic and eukaryotic cells	1 st	
2 nd & 3 rd	1 1 1	Genes and genomes - Nucleic acids: Structure and function - Replication, transcription and translation	3 rd	
4 th	1 1 1	Protein structure <ul style="list-style-type: none"> • Overview of protein structure • Higher level structure • Protein stability and folding - Protein post-translational modification	2 nd	
5 th & 6 th	6	Specific DNA techniques	3 rd and 5 th	
7 th and 8 th	6	Recombinant DNA technology.	3 rd	
9 th and 10 th	2 2 2	Production and down-stream processing of biotech products. <ul style="list-style-type: none"> • Expression systems. • Contaminants. Production and purification.	6 th and 7 th	
11 th	3	Formulation and delivery techniques of biopharmaceuticals	Ref 1 Ch. 9	
12 th and 13 th	6	Genomics, Proteomics and techniques used for drug discovery.	4 th	
14 th	3	Pharmacogenomics	4 th	
15 th	3	- Cancer genetics	13 th and 14 th	

Approved by Dept. Chair		Date of Approval	
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Extra Information: (Updated every semester and filled by course instructor)

Course Instructor	
Office No.	
Extension Email	
Office hours	