



كلية الصيدلة جامعة الزيتونة الأردنية
Faculty of Pharmacy
Al-Zaytoonah University of Jordan

" نحو تعليم صيدلاني متميز "
Toward Excellence in Pharmaceutical
Education

جامعة الزيتونة الأردنية
Al-Zaytoonah University of Jordan
كلية الصيدلة
Faculty of Pharmacy



"Tradition and Quality"

Detailed Course Description - Course Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-3.0E
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Faculty	Pharmacy	Department	Pharmacy
Course number	0201545	Course title	Pharmaceutical Biotechnology
Number of credit hours	3	Pre-requisite/co- requisite	Immunology/Pharmaceutical Technology

Brief course description

This course covers the basic principles of molecular biology and protein structure, it also focuses on topics such as formulation and delivery of biopharmaceuticals and the advances during the past twenty years and their effects on drug discovery and precise medicine.

	Course goals and learning outcomes
Goal 1	Introducing the basics of Molecular biology and techniques used in recombinant DNA technology and protein's formulation
Learning outcomes	The students should be able: 1.1 To understand the basic structures of DNA and RNA in prokaryotes and eukaryotes, significance of central dogma and the role of regulation mechanisms on proteins' structures and activities. 1.2 To understand the different techniques like PCR, sequencing and reverse transcription and their use in recombinant DNA technology. 1.3 To master the production of proteins through rDNA technology, purification and formulation
Goal 2	Providing the advances of molecular biotechnology tools and bioinformatics and their use in the identification of the molecular basis of diseases discovering new drug targets.
Learning outcomes	The students should be able: 2.1 To know the roles of genomics, proteomics and transcriptomic in drug target discovery. 2.2 To evaluate the effect of genetic variations (pharmacogenomics) on drug metabolism, efficacy of drugs and their toxicity.
Goal 3	Applications of future pharmaceutical biotechnology advances in treating diseases
Learning outcomes	The students should be able to: 3.1 Understand the role of gene therapy in treating diseases. 3.2 Understand the delivery routes of gene therapy. 3.3 Know the diseases that are currently treated or treatments under investigation using gene therapy.
Textbook	1.- Pharmaceutical Biotechnology : Fundamentals and Applications 4th ed. 2013 Daan J. A. Crommelin, Robert D. Sindelar, Bernd Meibohm
Supplementary references	1. Pharmaceutical Biotechnology: Concepts and Applications Gary Walsh, 2007. 2. Pharmaceutical Biotechnology. O. Kayser and R.H. Muller. 2004



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Course timeline				
Week	Number of hours	Course topics	Chapter (textbook)	Notes
1 st	1 1 1	Introduction - Important terms in Biotechnology - Procaryotic 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) 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 PCR DNA sequencing Gel electrophoresis cDNA synthesis	3 rd and 5 th	
7 th and 8 th	6	Recombinant DNA technology. Restriction enzymes Recombinant vectors Transformation Transfection Recombinant DNA hosts	3 rd	
9 th and 10 th	2 2 2	Production and down-stream processing of biotech products.) 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	- Gene therapy Carriers Technology Diseases	13 th and 14 th	
16 th		Final exam		



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Theoretical course evaluation methods and weight	First exam 25% Second exam 25% Final exam 50%	Practical (clinical) course evaluation methods	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%
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Approved by head of department		Date of approval	
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Extra information (to be updated every semester by corresponding faculty member)

Name of teacher	Lama Hamadneh	Office Number	235
Phone number (extension)	309	Email	lama.hamadneh@zuj.edu.jo
Office hours	11-12 am every day 8-9 am every day		