



الجامعة الزيتونة الأردنية  
Faculty of Pharmacy  
Al-Zaytoonah University of Jordan

" نحو تعليم صيدلاني متميز "  
Toward Excellence in Pharmaceutical  
Education

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



" Tradition and Quality "

<b>Detailed Course Description - Course Plan Development and Updating Procedures/ Pharmacy Department</b>	<b>QF02/0408-3.0E</b>
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Faculty	Pharmacy	Department	Pharmacy
Course number	0201764	Course title	Pharmaceutical Biotechnology
Number of credit hours	3	Pre-requisite/co- requisite	-

### Brief course description

This course covers the current topics in pharmaceutical biotechnology focusing on transforming small molecules, proteins, and genes into therapeutic products. The course also includes new drug therapies, drug design, pharmacogenomics, molecular modeling, high throughput screening, production and stability considerations, and delivery systems of protein and gene therapeutics in relation to pharmacokinetic and therapeutic responses.

Course goals and learning outcomes	
<b>Goal 1</b>	Understand the basics of Molecular biology and disease development
Learning outcomes	1.1 Understand the central dogma of molecular biology and the regulation levels in differentiated cells. 1.2 Understand the pathway of protein production and modifications in cells. 1.3 Understand the effect of mutations on protein's structures and functions
<b>Goal 2</b>	Understand recombinant DNA technology
Learning outcomes	2.1 Know the tools and methods to design primers. 2.2 know different types of plasmids 2.3 design a recombinant plasmid
<b>Goal 3</b>	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.
Learning outcomes	3.1 Know the role of genomics in drug target discovery 3.2 Know the role of proteomics in drug target discovery 3.3 Understand the effect of genetic variations (pharmacogenomics) on drug metabolism, efficacy of drugs and their toxicity
<b>Goal 4</b>	Understand the genetics of different diseases like cancer.
Learning outcomes	4.1 To know the genetic background of different cancer types 4.2 To use the genetic knowledge to identify new drug targets.
<b>Textbook</b>	1.- Pharmaceutical Biotechnology : Fundamentals and Applications 4th ed. 2013 Daan J. A. Crommelin, Robert D. Sindelar, Bernd Meibohm
<b>Supplementary references</b>	1.- Pharmaceutical Biotechnology: Concepts and Applications Gary Walsh, 2007  2. Updated papers and reviews in the topics discussed.



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Course timeline				
Week	Number of hours	Course topics	Pages (textbook)	Notes
01	1 1 1	DNA, RNA and proteins. Replication, gene expression and post translational modifications. Sense, antisense and nonsense		
02	1 1 1	Molecular techniques: Primers design PCR Gel electrophoresis cDNA synthesis Real time PCR/ Sequencing		
03	1 1 1	Recombinant DNA technology		
04	1 1 1	Pharmacokinetics of biopharmaceuticals Formulation and delivery of biopharmaceuticals		
05	1 1 1	Pharmacogenomics and personalized medicine.		
06	1 1 1	Mid-term		
07	1 1 1	Seminar 1		
08	1 1 1	Gene therapy		
09	1 1 1	Cancer genetics		
10	1 1 1	Immunotherapy and cell culture techniques		



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11	1 1 1	Mitochondrial DNA, diseases, applications and treatments		
12	1 1 1	Stem cells		
13	1 1 1	Epigenetics		
14	1 1 1	DNA vaccines		
15	1 1 1	Seminar 2		
16	1 1 1	Final Exam		

<b>Theoretical course evaluation methods and weight</b>	Participation = 10% First exam 20% Second exam 20% Final exam 50%	<b>Practical (clinical) course evaluation methods</b>	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%
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<b>Approved by head of department</b>		<b>Date of approval</b>	
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Extra information (to be updated every semester by corresponding faculty member)

<b>Name of teacher</b>	Dr. Lama Hamadneh	<b>Office Number</b>	235
<b>Phone number (extension)</b>	309	<b>Email</b>	<a href="mailto:lama.hamadneh@zuj.edu.jo">_lama.hamadneh@zuj.edu.jo</a>
<b>Office hours</b>	12-1 every day		