



Philadelphia University
Faculty of Pharmacy
Department of Pharmacy
Second semester, academic year 2017/2018

Course syllabus

Course title Pharmaceutical Biotechnology	Course code: 510541
Course level: 5	Course prerequisite (s) and/or co-requisite (s): 510215
	Credit hours:3
	Contact hours:

Academic
Staff
Specifics

Name	Rank	Office number and location	Office hours	E-mail address
Dr. Mohammad Shomali	Assistant Professor	Nursing: 506	9-10,11-12 9:45-12:45	mshomali@philadelphia.edu.jo

Course description (According to the University Catalogue)

The course is an introductory to nucleic acid (DNA and RNA) manipulation and how genes are expressed in vitro. It will explain the tools and methods that are used by working with nucleic acid.

The course will introduce students also to techniques that are used in the diagnostic of genetic mutation (genetic diseases).

The students will learn the technology used in preparing protein based drugs and other pharmaceutical substances used for treat and diagnose diseases.

In addition, they learn how the pharmacodynamics and pharmacokinetics of protein based drugs.

Course objectives:**At the end of this course the student will be capable to:**

understand the composition and technology of biopharmaceutical drug production, and development and the principle usage of the gene therapy, students will expand their practical knowledge and understanding of therapeutically effects as well as of undesired side effects of biopharmaceuticals. Transferable/Key Skills and other attributes. Appreciate and understand the legal steps involved in progressing a new drug to market. Demonstrate knowledge and understanding of currently topical and newly emerging aspects of pharmaceutical biotechnology.

Course/ resources

- **Text book/ books**

Pharmaceutical Biotechnology, third edition. Crommelin J.A., Sindelar, RD and Meibohn, B, Informa Healthcare USA New York, 2008

- **Support material.**

Presentations and handouts.**Teaching methods (Lectures, discussion groups, tutorials, problem solving, debates, etc)**

Lectures, discussion groups, presentations, problems

Learning outcomes:

- Knowledge and understanding

Understand the principle of biotechnology, the meaning of protein based drugs, methods of protein production and purification, formulation of biotechnology products, use of monoclonal antibodies, nucleic acid and stem cells in the therapy and the meaning of pharmacogenetics and gene therapy. Knowing the ethics in the use of biotechnology.

- Cognitive skills (thinking and analysis).

1. Students will have a basic understanding of the biotechnological scientific method.
2. Students will have the opportunity to practice thinking critically and analytically and reason logically using current information and past experiences.
3. Students will have practice in assessing basic sources of information and how to evaluate and use this information.
4. Knowing the methods used in biotech production
5. Knowing the impact of the protein based drug on the cell

- Communication skills (personal and academic).

- Students will gain experience in effective communication skills by practicing, listening, reading, writing and speaking clearly.
- (trying) Short oral presentations of 5-8 minutes will be required of all students as groups and will be given during a class period. Students will pick Pharmaceutical Biotechnology topic and discuss specific issues related to the topic

- Transferable Skills.

Students will develop an awareness of the relationship between science and technology in terms of the life and Pharmaceutical Biotechnology.

Emphasis will be placed upon an analytical problem-solving approach to Pharmaceutical Biotechnology

Assessment instruments

- Exams (First, Second and Final Exams)
- Quizzes.
- Short reports and/ or presentations, and/ or Short research projects
- Homework assignments

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
First examination	20
Second examination	20
Final examination	40
Reports, research projects, quizzes, homework, Projects	20
Total	100

Documentation and academic honesty

- Documentation style (with illustrative examples)

All University policies regarding academic integrity apply to this course. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor.

- Protection by copyright

Students should realize that some published information or data are the property of their authors and they are not allowed to use it without asking permission from the originators

- Avoiding plagiarism.

Plagiarism is the unauthorized use or close imitation of the language and thoughts of another author and the representation of them as one's own original work, without proper acknowledgment of the author or the source. Students must pursue their studies honestly and ethically in accordance with the academic regulations. Cheating in exams and plagiarism are totally unacceptable and those who, intentionally, commit such acts would be subjected for penalties according to the university regulations

Course/ academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	Introduction to Biotechnology	
(2-3)	Genes and Genome (replication, transcription and translation)	

(4)	Production of protein and Proteomics	Covering materials: vectors, transformation, recombinant DNA technology and selection methods
(5)	Production of protein and Proteomics	Production of protein in prokaryotes and eukaryotes and the methods of purification
(6)	Production of protein and Proteomics/Formulation of Biotech products	Quantification and qualification as well as verification of produced protein
(7)	Examples: Interferons, Interleukins and insulin, Immunogenicity of recombinant proteins	
(8)	Interferons, Interleukins and insulin, Immunogenicity of recombinant proteins	
(9)	Pharmacokinetics and Pharmacodynamics of Peptide and Protein based Drugs	
(9)	Monoclonal Antibodies and Therapy	
(11)	Immunization and Vaccines	
(12)	Nucleic Acids and Gene Therapy	
(13)	Nucleic Acids and Gene Therapy	
(14)	Medical Biotechnology	
(15)	Pharmacogenetics	
(15)	Microbial and Animal Biotechnology	
(16)	Final Examination	

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Other Education Resources

Books

Pharmaceutical Biotechnology by Groves, 2006 Taylor and Francis

Pharmaceutical Biotechnology Drug Discovery and Clinical Application, 2004, Kayser and Mueller

Journals

Any biotechnology, pharmaceutical microbiology and pharmaceutical biotechnology Journal will be of great benefits to the student for their assignment

Websites

www.pubmed.org