Course Plan for Bachelor Program - Study Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-4.0E

Study Plan No.	**2021/2022**		**University Specialization**		**Bachelor of Pharmacy**	
Course No.	**0201559**		**Course Name**		**Gene and Protein Therapy**	
Credit Hours	**3**		**Prerequisite *Co-requisite**		**Pharmaceutical Biotechnology**	
Course Type	☐ Mandatory University Requirement	☐ University Elective Requirement	☐ Faculty Mandatory Requirement	☐ Support course family requirements	☐ Mandatory Requirement	☑ **Elective Requirement**
Teaching Style	☐ Full Online Learning		☑ **Blended Learning**		☐ Traditional Learning	
Teaching Model	☐ 1 Synchronous: 1 Asynchronous		☑ **1 Face to Face: 1 Asynchronous**		☐ 2 Traditional	

Faculty Member and Study Divisions Information *(to be filled in each semester by the subject instructor)*

Name	Academic rank	Office No.	Phone No.	E-mail	
Office Hours (Days/Time)	**Sunday, Tuesday, Thursday ()**		**Monday, Wednesday ()**		
Division number	**Time**	**Place**	**Number of Students**	**Teaching Style**	**Approved Model**
				Blended Learning	**1 Face to Face: 1 Asynchronous**

Brief Description

Gene and Protein Therapy course describes the basics of gene therapy and the routes of delivery in treatment of genetic diseases. It also covers different approaches and applications of stem cells therapy, therapeutic hormones and enzymes and monoclonal antibodies which used in treatment of different diseases, such as cancers and auto-immuno diseases..

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	Pharmaceutical Biotechnology: Fundamentals and Applications 5th edition. 2019 Daan J. A. Crommelin, Robert D. Sindelar, Bernd Meibohm			
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. Pharmaceutical Biotechnology: Concepts and Applications Gary Walsh, 2007. 2. Biotechnology: An Introduction. Susan Barnun, 2nd Edition, 2006.			
Supporting Websites	-			
The Physical Environment for Teaching	☑ **Classroom**	☐ Labs	☑ **Virtual Educational Platform**	☐ Others
Necessary Equipment and Software	Moodle			
Supporting People with Special Needs	-			

For Technical Support	E-Learning & Open Educational Resources Center Email: elearning@zuj.edu.jo; Phone: +962 6 429 1511 ext. 425/362

Course learning outcomes *(K= Knowledge, S= Skills, C= Competencies)*

No.	Course Learning Outcomes	The Associated Program Learning Output Code
Knowledge **The student should be able to:**		
K1	Understand the basics of gene therapy approaches to treat genetic diseases.	**MK2**
K2	Identify the concepts of cellular therapy and stem cells	**MK2**
K3	Understand the role of therapeutic proteins and monoclonal antibodies	**MK2**
Skills **The student should be able to:**		
S1	Interpret the factors related to the effect and possible side effects of different novel treatments.	**MS4**
S2	Solve problems related to the formulation and delivery of proteins, genes, and cellular therapies.	**MS4**
Competencies **The student should be able to:**		
C1	Evaluate the diseases that could be treated with gene, protein and cellular therapies.	**MC3**
C2	Develop his/her professional and personal performance by continuously following-up lectures, submitting tasks on time, and staying up to date with the latest gene and protein therapies.	**MC3**

Mechanisms for Direct Evaluation of Learning Outcomes

Type of Assessment / Learning Style	Fully Electronic Learning	Blended Learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm Exam	30%	**30%**	30%	25%
Participation / Practical Applications	0	**0**	20%	25%
Asynchronous Interactive Activities	20%	**20%**	0	0
Final Exam	50%	**50%**	50%	50%

Note 1: *Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, and work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.*

Note 2: *According to the Regulations of granting Master's degree at Al-Zaytoonah University of Jordan, 40% of final evaluation goes for the final exam, and 60% for the semester work (examinations, reports, research or any scientific activity assigned to the student).*

Schedule of Simultaneous / Face-to-Face Encounters and their Topics

Week	Subject	Learning Style*	Reference ** (Pages in Course Book)
1	Pharmacokinetic and pharmacodynamics of therapeutic proteins	**Lecture**	101
2	Immunogenicity to therapeutic proteins	**Lecture**	133
3	Insulin, glucagon	**Lecture**	255
4	Therapeutic hormones	**Lecture**	277
5	Cytokines and interferons	**Lecture**	413
6	Recombinant coagulation factors	**Lecture**	299
7	Growth factors	**Lecture**	285 361
8	Monoclonal antibodies	**Lecture**	143
9	Monoclonal antibodies in cancer **Midterm Exam**	**Lecture**	337
10	Monoclonal antibodies in solid organ transplantation	**Lecture**	375
11	Monoclonal antibodies in inflammatory diseases	**Lecture**	393
12	Oligonucleotides	**Lecture**	459
13	Vaccines	**Lecture**	439
14	Stem cells technology	**Lecture**	507
15	New updated topics.	**Lecture**	-
16	**Final Exam**	**-**	**-**

** Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.*
*** Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.*

Schedule of Asynchronous Interactive Activities *(in the case of e-learning and blended learning)*

Week	Task / Activity	Reference	Expected Results
2	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
3	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
4	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
5	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
6	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
7	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
8	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**

9	**Midterm Exam**		
10	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
11	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
12	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
13	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
14	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
15	Watch a recorded lecture	Video on the E-learning platform	**Online quiz**
16	**Final Exam**		