

Philadelphia University	 PHILADELPHIA UNIVERSITY THE WAY TO THE FUTURE	Approval date:
Faculty of Science		Issue:
Department of Biotechnology and Genetic Engineering		Credit hours: 1
Academic year 2022/2023		Bachelor

Course information

Course#	Course title	Prerequisite
0240472	Animal Tissues Culture	0240471
Course type		Class time
☐ University Requirement ☐ Faculty Requirement ☒ Major Requirement ☐ Elective ☒ Compulsory		Section 1 Mon (13:10-16:00)
		Room # 2910

Instructor Information

Name	Office No.	Phone No.	Office Hours	E-mail
Ahmad Ghuneim	s823	2491	Sun,Tue (08:00-09:00) Mon,Wed (12:00-13:00)	aghuneim@philadelphia.edu.jo

Course Delivery Method

Course Delivery Method			
☒ Physical	☐ Online	☐ Blended	
Learning Model			
Precentage	Synchronous	Asynchronous	Physical
			☒

Course Description

This module is a basic requirement for the department. It provides insights into the practical aspects of cell culture. The lab should provide sufficient information to perform the basic techniques. It is intended as an introduction to the theory of techniques and the biology of cultured cells.

Course Learning Outcomes

Number	Outcomes	Corresponding Program outcomes
Knowledge		
K1	Understand and explain key concepts of cell biology as they relate to manipulating cells in culture, and differentiate between different types of cells and tissue sources.	Kp1
Skills		
S1	Demonstrate ability and responsibility in using, preserving and maintaining laboratory equipment's necessary in the applications of biotechnology and related fields.	Sp1
S2	Demonstrate proficiency; establish, maintain and preserve cell and tissue.	Sp3
Competencies		
C1	Recognize the use of biotechnology to study, monitor and treat diseases and alter food and environment.	Cp1
C2	Demonstrate critical thinking skills utilize a wide range of information sources and communicate through oral presentations and written reports.	Cp2
C3	Recognize the need for, and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.	Cp3
C4	Demonstrate professional and ethical conduct in compliance with biorisk and biosafety regulations.	Cp4

Learning Resources

Course textbook	There is no lab manual for this course. Lab sheets and published papers will be provided for every student.
Supporting References	
Supporting websites	
Teaching Environment	☐ Classroom ☒ laboratory ☐ Learning platform ☐ Other

Meetings and subjects timetable

Week	Topic	Learning Methods	Tasks	Learning Material
1	Introduction to Cell culture Lab design, Equipment, Safety in the Lab, and Aseptic Conditions	Lecture		Handouts
2	Cells Counting and Cell Viability Assessment	Lecture and practical work	Counting Viable Cells in the hemacytometer	Handouts
3	Dissecting Mouse and Primary Culture of Splenocytes	Lecture and practical work	Dissecting mouse and preparing primary culture from BM of mouse hind limbs	Handouts
4	Organ Disaggregation Techniques	Lecture and practical work	Disaggregating mouse liver by mechanical and trypsinization methods	Handouts
5	Culture of Bone Marrow cells and stem cells	Lecture and practical work	Culture and subculture of BM cells	Handouts
6	Stem cells(Bone marrow source) differentiation into adipose and Osteoblast cells.	Lecture and practical work	In vitro differentiation of MCSs into Osteocytes and Adipocytes	Handouts
7	Midterm Exam			Handouts
8	Cell line culture(e.g MCF-7, CHO, Sp2) Generation of Hybridoma and monoclonal antibody production.	Lecture and practical work		Handouts
9	Feeding , trypsinization and other follow up cell line culture steps	Collaborative and practical work	Feeding and trypsinization of cells	Handouts
10	Mini-project(working group:	Project based learning		Handouts
11	MTT Assay and IC50	Lecture and practical work	Performing MTT Assay	Handouts
12	Cell freezing(Cryopreservation) General Discussion	Collaborative learning	Using very low temperature to preserve cells	Handouts
14	Review			
15	Final Exam			

* includes: Lecture, flipped Class, project- based learning, problem solving based learning, collaborative learning

Course Contributing to Learner Skill Development

Using Technology
Electronic grade books, Electronic rubrics and Open online resources
Communication skills
Creating a safe ambiance, motivate students to initiate and engage in conversation, encouraging them to participate in teamwork and sharing opinions.
Application of concepts learnt
Inspiring students to set challenging goals and transferring the knowledge to new problems and situations by engaging them in cooperative learning and simulation.

Assessment Methods and Grade Distribution

Assessment Methods	Grade Weight	Assessment Time (Week No.)	Link to Course Outcomes
Mid Term Exam	% 30	7	K1,S1, S2
Various Assessments *	% 30	2-11	K,S,C
Final Exam	% 40	15	K1, S2
Total	%100		

* includes: quiz, in class and out of class assignment, presentations , reports, videotaped assignment, group or individual projects.

Alignment of Course Outcomes with Learning and Assessment Methods

Number	Learning Outcomes	Learning Method*	Assessment Method**
Knowledge			
K1	Understand and explain key concepts of cell biology as they relate to manipulating cells in culture, and differentiate between different types of cells and tissue sources.	- Lecture - Practical work	- Exam - Report - Quiz
Skills			
S1	Demonstrate ability and responsibility in using, preserving and maintaining laboratory equipment's necessary in the applications of biotechnology and related fields.	Practical work.	Exam Report Observation
S2	Demonstrate proficiency; establish, maintain and preserve cell and tissue.		

Number	Learning Outcomes	Learning Method*	Assessment Method**
Competencies			
C1	Recognize the use of biotechnology to study, monitor and treat diseases and alter food and environment.	- Lecture - Practical work	Report Project
C2	Demonstrate critical thinking skills utilize a wide range of information sources and communicate through oral presentations and written reports.	- Collaborative - Practical Work	Project Reports
C3	Recognize the need for, and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.	- Project based Learning	Project Report
C4	Demonstrate professional and ethical conduct in compliance with biorisk and biosafety regulations.	- Practical Work	Observation

* includes: Lecture, flipped Class, project- based learning , problem solving based learning, collaborative learning

** includes: quiz, in class and out of class assignment , presentations , reports, videotaped assignment, group or individual projects.

Course Policies

Policy	Policy Requirements
Passing Grade	The minimum passing grade for the course is (50%) and the minimum final mark recorded on transcript is (35%).
Missing Exams	- Missing an exam without a valid excuse will result in a zero grade to be assigned to the exam or assessment. - A Student who misses an exam or scheduled assessment, for a legitimate reason, must submit an official written excuse within a week from the an exam or assessment due date. - A student who has an excuse for missing a final exam should submit the excuse to the dean within three days of the missed exam date.
Attendance	The student is not allowed to be absent more than (15%) of the total hours prescribed for the course, which equates to six lectures days (M, W) and seven lectures (S,T,R). If the student misses more than (15%) of the total hours prescribed for the course without a satisfactory excuse accepted by the dean of the faculty, s/he will be prohibited from taking the final exam and the grade in that course is considered (zero), but if the absence is due to illness or a compulsive excuse accepted by the dean of the college, then withdrawal grade will be recorded.
Academic Honesty	Philadelphia University pays special attention to the issue of academic integrity, and the penalties stipulated in the university's instructions are applied to those who are proven to have committed an act that violates academic integrity, such as: cheating, plagiarism (academic theft), collusion, and violating intellectual property rights.

Program Learning Outcomes to be Assessed in this Course

Number	Learning Outcome	Course Title	Assessment Method	Target Performance level
Kp1	Understand and recognize the biochemical, molecular and cellular structure of organisms and biological systems.	Animal Tissue Culture	Exam Reports	75%
Sp1	Demonstrate ability and responsibility in using, preserving and maintaining laboratory equipment's necessary in the applications of biotechnology and related fields.	Animal Tissue Culture	Observation, Report	75%
Sp3	Demonstrate proficiency; establish, maintain and preserve cell and tissue.	Animal Tissue Culture	Observation, Report	75%
Cp1	Recognize the use of biotechnology to study, monitor and treat diseases and alter food and environment.	Animal Tissue Culture	Exam Reports	75%
Cp2	Demonstrate critical thinking skills utilize a wide range of information sources and communicate through oral presentations and written reports.	Animal Tissue Culture	Project report	75%
Cp3	Recognize the need for, and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.	Animal Tissue Culture	Project report	80%
Cp4	Demonstrate professional and ethical conduct in compliance with biorisk and biosafety regulations.	Animal Tissue Culture	Observation	80%