

Philadelphia University	 PHILADELPHIA UNIVERSITY THE WAY TO THE FUTURE	Approval date:
Faculty: Science		Issue:
Department: Biotechnology and Genetic Engineering		Credit hours: 3
Academic year 2023-2024		Course Syllabus

Course information

Course#	Course title	Prerequisite
0240386	Molecular Biology	240233
Course type		Class time
<input type="checkbox"/> University Requirement <input checked="" type="checkbox"/> Major Requirement <input checked="" type="checkbox"/> Compulsory	<input type="checkbox"/> Faculty Requirement <input type="checkbox"/> Elective	9.45-10.35 am ST Online
		Room #
		2902

Instructor Information

Name	Office No.	Phone No.	Office Hours	E-mail
Prof. Raida Khalil	914	ext. 2250	TW: 11-15- pm	R_khalil@philadelphia.edu.jo

Course Delivery Method

Course Delivery Method			
<input type="checkbox"/> Physical	<input type="checkbox"/> Online	<input checked="" type="checkbox"/> Blended	
Learning Model			
Percentage	Synchronous	Asynchronous	Physical
			100%

Course Description

The study of biological systems at the molecular level is known as molecular biology. Molecular biology studies how proteins and nucleic acids interact within cells to support healthy growth, division, and development. The subjects discussed include the chromosome organization, the molecular basis of .(gene regulation, and the structure and replication of DNA (Transcription and translation)

Course Learning Outcomes

Number	Outcomes	Corresponding Program outcomes
Knowledge		
K1	Students will demonstrate knowledge of the central dogma of biology and predict outcomes when the process malfunctions.	K_p1

K2	account for the genetic information flow in the eukaryotic cell; including nucleic acid structures, the definition of a gene,	K_{P3}
K3	Correlate the protein-DNA interaction to DNA replication and gene expression	K_{P1}
Skills		
S1	Critique and professionally present primary literature articles in the general Molecular Biology	S_{P4}
S2	Assigned original article will hand in to students week ahead the group discussion	S_{P4}
S3	Predict the consequences of various types of mutations on gene expression and organism's viability.	S_{P2}
Competencies		
C1	The organization of the genome, the replication, the formation of RNA (transcription), the processing of pre mRNA and the protein synthesis (translation).	C_{P1}
C2	Account for how genes are regulated.	C_{P1}

Learning Resources

Course textbook	Molecular Cell Biology Author(s): Lodish, A. Berk et al , 9 th edition (2021) Publisher: W. H. Freeman and Company ISBN: 978-1-4641-87445 (8 th edition)
Supporting References	<u>Recent literature(suggested readings and web sites required for assignments through Philadelphia library resources,</u>
Supporting websites	https://pubmed.ncbi.nlm.nih.gov
Teaching Environment	<input checked="" type="checkbox"/> Classroom <input type="checkbox"/> laboratory <input checked="" type="checkbox"/> Learning platform <input type="checkbox"/> Other

Meetings and subjects timetable

Week	Topic	Learning Methods	Tasks	Learning Material
1	Discuss course syllabus Introduction to course contents and to The Structures of DNA and other Macromolecules	lectures + Discussion	Revision Background related to topic Assessment	Chapters 2 & 5
2	The Structures and versatility of RNA Chemical and Physical properties of Nucleic Acids	lectures + Discussion	Assessment	Chapter 5
3	The Replication of DNA	Lecture problem solving based learning	Assessment Article assigned	Chapter 5
4	DNA Repair and Recombination	Lectures+ , problem solving based learning	Presentation According to assigned schedule	Chapter 5

5	Eukaryotic Gene Structure and Organization Chromosomal Organization of Genes and Noncoding DNA	Lectures+ , problem	Assessment	Chapter 7
6	Simple and Complex Transcription Units Are Found in Eukaryotic Genomes	Lectures+ , problem	Assessment	Chapter 7
7	Transposable (Mobile) DNA Elements	Lectures+ , problem	Assessment	Chapter 7
8	Structural Organization of Eukaryotic Chromatin and Chromosomes Midterm	Lectures+ , problem solving based learning	Assessment Article assigned	Chapter 7
9	Transcriptional Control of Gene Expression Overview of Eukaryotic Transcription	Lectures+ , problem solving based learning Collaborative learning	Assessment Article assigned	Chapter 8
10	Overview of Eukaryotic Transcription	Lectures+ , flipped Class	Assessment Article assigned	Chapter 8
11	RNA Polymerase II Promoters and General Transcription Factors	Lectures+ , problem solving based learning	Assessment Article assigned	Chapter 8
12				
13	Regulatory Sequences for Protein-Coding Genes and the Proteins Through Which They Function	Lectures+ , problem solving based learning	Assessment Article assigned	Chapter 8
14	-Molecular Mechanisms of Transcription Repression and Activation -Epigenetic Regulation of Transcription -Post-Transcriptional Gene Control	Lectures+ , problem solving based learning	Assessment	Chapter 8
15	Stepwise Synthesis of Proteins on Ribosomes	Lectures+ , problem solving based learning flipped Class	Article assigned Video	Chapter 5
16	Final Exam			

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

Course Contributing to Learner Skill Development

Using Technology
Educated videos, Links related to topics ; Learning Analysis Journals ; presentations prepared by students
Communication skills
Discussion assigned articles by collaborative learning
Application of concepts learnt
At the end of each topics students will expose to the medical and pharmaceutical applications of different concepts of Molecular Biology

Assessment Methods and Grade Distribution

Assessment Methods	Grade Weight	Assessment Time (Week No.)	Link to Course Outcomes
Mid Term Exam	% 30	Week 8	K1 and C1
Various Assessments *	% 30	Each week	All
Final Exam	% 40	Week 16	All
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	Students will demonstrate knowledge of the central dogma of biology and predict outcomes when the process malfunctions.	Lecture problem solving based learning	Quiz videotaped assignment
K2	account for the genetic information flow in the eukaryotic cell; including nucleic acid structures, the definition of a gene,	Lecture problem solving based learning collaborative learning	Assignment Quiz
K3	Correlate the protein-DNA interaction to DNA	Lecture	Assignment

	replication and gene expression	problem solving based learning collaborative learning	Quiz Presentation
Skills			
S1	Critique and professionally present primary literature articles in the general Molecular Biology	problem solving based learning collaborative learning	Quiz videotaped assignment
S2	Assigned original article will hand in to students week ahead the group discussion	flipped Class	assignment Quiz videotaped assignment
S3	Predict the consequences of various types of mutations on gene expression and organism's viability.	flipped Class collaborative learning	Assignment Presentation
Competencies			
C1	The organization of the genome, the replication, the formation of RNA (transcription), the processing of pre mRNA and the protein synthesis (translation).	collaborative learning	Quiz
C2	Account for how genes are regulated.		Quiz Presentation Assignment

* 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 Polices

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	<ul style="list-style-type: none"> 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.	Molecular biology	Comprehensive exam	100% students will achieve 68% and more based on assessment rubric

Description of Program Learning Outcome Assessment Method

Number	Detailed Description of Assessment
Kp1	Comprehensive questions (10 marks included in the final exam)

Assessment Rubric of the Program Learning Outcome

criteria	score			
	4	3	2	1
Concept	The answers given indicate a thorough understanding of the concept	The answers given indicate a less comprehensive understanding of the concept	The answers given indicate misconceptions	The answers given indicate the student are not understand the concept
Comprehensive	The answers given indicate the ability to relate one information to another , comprehensively	The answers given indicate the ability to relate one information to another , partly	The answers given indicate less ability to relate one information to another	The answers given indicate not comprehensive
Language structure	The answers given in accurate ,short ,and clear sentences	The answers given in accurate and short sentences ,but clear	The answers given in short sentences , but not accurate nor clear	The answers are not given in accurate , short , and clear sentences