ABDULLAH GUL UNIVERSITY
GRADUATE SCHOOL OF ENGINEERING & SCIENCE
BIOENGINEERING DEPARTMENT
COURSE DESCRIPTION AND SYLLABUS

Course Name	CODE	SEMESTER	T+L Hour	CREDIT	ECST
Molecular Cell Biology for Engineers	BENG541	FALL-SPRING	3 + 0	3	7,5

Prerequisite Courses	

Course Type	Elective
Course Language	English
Course Coordinator	Asst. Prof. Dr. AYSUN ADAN
Lecturers	Dr.Adan, Dr. Mona El Khatib, Dr.Okhubo
Course Assistants	-
Course Objectives	Basic princibles of molecular cell biology and common research methods will be covered and how to apply these approaches to the field of interest for students with bioengineers/ biomedical background
Learning Outcomes	1. Understanding of the basic princibles of molecular cell biology and genetic engineering 2. Understanding of the basic mechanisms and functions of molecular processes 3. Applying the basics of molecular biology knowledge to bioengineering or biomedical field 4. Searching scientific databases and sources, project writing and presentation skills for students
Course Content	Includes the basic princibles of cell biology, molecular biology and genetic engineering forstudents with bioengineers/ biomedical background: Organelles, cytoskeleton, DNA replication, transcription, translation, regulation gene expression, cell membrane and transport, cell-cell interactions, cell signaling, recombinant DNA technology, molecular modelling

WEEKLY SUBJECTS AND RELATED PRELIMINARY PAGES

Week	Subjects	Preliminary
1	Introduction to the cell biology, Organelles and cytoskeleton	Defined chapters in the recommended book, Scientific Journals
2	Cell membrane and its function	Defined chapters in the recommended book, Scientific Journals
3	Cellular traffic and transport	Defined chapters in the recommended book, Scientific Journals
4	Cell signaling	Defined chapters in the recommended book, Scientific Journals
5	Cell divisin and its regulation	Defined chapters in the recommended book, Scientific Journals
6	Cell death mechanism	Defined chapters in the recommended book, Scientific Journals
7	DNA and DNA replication	Defined chapters in the recommended book, Scientific Journals
8	MIDTERM	
9	Transcription and Translation	Defined chapters in the recommended book,

		Scientific Journals
10	Gene regulation I	Defined chapters in the recommended book, Scientific Journals
11	Gene regulation II	Defined chapters in the recommended book, Scientific Journals
12	Molecular probes	Defined chapters in the recommended book, Scientific Journals
13	Molecular modeling	Defined chapters in the recommended book, Scientific Journals
14	Molecular cloning: recombinant DNA technology	Defined chapters in the recommended book, Scientific Journals
15	Presentations	
16	FİNAL	

RESOURCES	
Course Notes	Alberts, B. *Molecular Biology of the Cell.* Garland Science, Taylor & Francis Group, LLC, New York, NY, USA
Other Resources	Scientific reviews

MATERIAL SHARING	
Documents	Lecture notes will be shared
Homework	A scientific presentation at the end of the semester
Exams	Midterm, Final

RATING SYSTEM		
SEMESTER WORKS	**NUMBER**	**CONTRIBUTION**
Midterm	1	35
Presentation	1	25
Final	1	45
TOTAL		100
Success Rate of Semester		60
Success Rate of Final		40
TOTAL		100

Course Category	
Basic Sciences and Mathematics	X
Engineering Sciences	
Social Sciences	

THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES AND PROGRAM COMPETENCE							
No	Program Outcomes	Contribution Level					
		1	2	3	4	5	
1	Understanding of Life Sciences, Mathematics and Engineering at the post-graduate level, and being able to implement of this knowledge into bioengineering problems					x	
2	Having the ability of developing a new scientific method or a technological product or process, and, designing experiments, implementing, collecting data and evaluating regarding these issues					x	
3	Choosing technical equipment used in the applications related to bioengineering, having sufficient knowledge in adopting and using new technological equipment					x	
4	Having the ability of reaching the information, using resources, contributing to the literature					x	

	by transferring the process and results of scientific studies as written or verbally in the national and international environments					
5	Having the ability of working as an individual or a team, in the teams composed of discipline or different disciplines, gaining awareness of leadership and taking responsibility				x	
6	Having advanced level of foreign language knowledge to manage efficient verbal, written and visual communication in the major field					x
7	Having the understanding of ethics in science and the responsibility in profession with the awareness of lifelong learning, being beneficial to society and sensitiveness to global issues					x
8	Being aware of the social impacts of the solutions and applications of the challenges regarding Bioengineering				x	

*From 1 to 5, it increasingly goes.

ECTS / WORK-LOAD TABLE			
Activities	Activities	Duration (Hour)	Total (Work-Load)
Course Duration (Including exam week: 16x total course hour)	16	3	48
Out of Class Exercise Time (Pre-study, reinforcement)	16	7	112
Reading			
Searching on Internet, library study	16	5	90
Material Designing, practice			
Preparation of report			
Preparation of presentation	1	18	18
Presentation	1	3	3
Homework			
Midterms	1	15	15
Final	1	15	15
Total Work-Load			301
Total Work-Load / 30			301/30
Course ECTS Credit			7,5