

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

Course Name	CODE	SEMESTER	T+L Hour	CREDIT	ECST
Molecular Biology lab for Engineers	BENG511	FALL-SPRING	3+0	3	10

<b>Prerequisite Courses</b>	None
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<b>Course Type</b>	Elective
<b>Course Language</b>	English
<b>Course Coordinator</b>	Assist. Prof. Dr. Aysun Cebeci Aydın
<b>Lecturers</b>	Assist. Prof. Dr. Aysun Cebeci Aydın
<b>Course Assistants</b>	None
<b>Course Objectives</b>	To learn basic molecular biology techniques
<b>Learning Outcomes</b>	Student will learn about <ul style="list-style-type: none"> <li>• Basic principles in designing molecular biology experiments</li> <li>• Apply basic molecular biology knowledge in a research project</li> <li>• Learn the steps of the protocols, and interpret the results</li> </ul>
<b>Course Content</b>	Laboratory safety, DNA, RNA, PCR, qRT-PCR, plasmid isolation, sequencing

**WEEKLY SUBJECTS AND RELATED PRELIMINARY PAGES**

Week	Subjects	Preliminary
1	Introduction I: Lab safety	Main course book and related articles
2	Introduction II: Preparation of the solutions	Main course book and related articles
3	DNA isolation, quantification and characterization	Main course book and related articles
4	Primer design	Main course book and related articles
5	PCR	Main course book and related articles
6	Plasmid isolation from bacteria	Main course book and related articles
7	Restriction enzymes	Main course book and related articles
8	Ligation	Main course book and related articles
9	Preparation for sequencing	Main course book and related articles
10	Midterm	Main course book and related articles
11	Interpreting sequencing results	Main course book and related articles
12	Reverse transcription	Main course book and related articles
13	RNA isolation	Main course book and related articles
14	qRT-PCR	Main course book and related articles
15	Interpretation of qRT-PCR results	Main course book and related articles
16	Final exam	Main course book and related articles

**RESOURCES**

<b>Course Notes</b>	Lecture notes and slides
<b>Other Resources</b>	Course main book: "Molecular Biology Techniques, A Classroom Laboratory Manual" 3rd Edition

**MATERIAL SHARING**

<b>Documents</b>	Lecture notes and slides
<b>Homework</b>	1 homework / week
<b>Exams</b>	1 MT and 1 Final

**RATING SYSTEM**

<b>SEMESTER WORKS</b>	<b>NUMBER</b>	<b>CONTRIBUTION</b>
Midterm	1	20
Homework	14	25
Quizzes	14	25
<b>TOTAL</b>		70
<b>Success Rate of Semester</b>		70
<b>Success Rate of Final</b>	1	30
<b>TOTAL</b>		100

**Course Category**

Basic Sciences and Mathematics	%90
Engineering Sciences	%10
Social Sciences	%00

**THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES AND PROGRAM COMPETENCE**

		Contribution Level				
No Program Outcomes		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 by transferring the process and results of scientific studies as written or verbally in the national and international environments					X
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
Searching on Internet, library study	14	3	42
Quizzes	14	2	28
Homework	14	3	42
15Midterms	1	15	15
Final	1	15	15
<b>Total Work-Load</b>			302
<b>Total Work-Load / 30</b>			302/30

<b>Course ECTS Credit</b>			10
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