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

Course Name	CODE	SEMESTER	T+L Hour	CREDIT	ECST
Basic Engineering for Bioengineers	BENG 530	FALL- SPRING	3 + 0	3	10

Prerequisite Courses	

Course Type	Elective
Course Language	English
Course Coordinator	Asst. Prof. İsmail Alper İşoğlu
Lecturers	Asst. Prof. İsmail Alper İşoğlu
Course Assistants	-
Course Objectives	To become familiar with the fundamental principles of engineering and to be able to use these principles in the related research fields
Learning Outcomes	Students, • To be able to understand the fundamental principles of engineering • To be able to calculate things related to engineering and to analyze the data • To be able to describe the mass and energy equations and their technics • To be able to define the basic principles and applications of process engineering • To be able to comprehend the basic principle and applications of reaction and reactor • To be able to make research, to utilize the scientific sources and to attain the ability of designing the project
Course Content	The fundamental principles of engineering, calculation based on engineering, mass and energy equations, fluid mechanics in the process engineering, the principle and applications of heat and mass transfer, the fundamental of reaction engineering and homogeneous and heterogeneous reactor.

WEEKLY SUBJECTS AND RELATED PRELIMINARY PAGES

Week	Subjects	Preliminary
1	Introduction to engineering	Related sections of the recommended books and articles
2	Calculation based on engineering and analysis of data	Related sections of the recommended books and articles
3	Mass equation	Related sections of the recommended books and articles
4	Energy equation	Related sections of the recommended books and articles
5	Energy equation	Related sections of the recommended books and articles
6	Midterm I	
7	Fluid mechanics	Related sections of the recommended books and articles
8	Mass equation	Related sections of the recommended books and articles
9	Energy equation	Related sections of the recommended books and articles
10	Basic calculations	Related sections of the recommended books and articles
11	Midterm II	

12	Reactors	Related sections of the recommended books and articles
13	Homogeneous reactors	Related sections of the recommended books and articles
14	Heterogeneous reactors	Related sections of the recommended books and articles
15	Presentation	
16	Final	

RESOURCES	
Course Notes	Pauline M. Doran. *Bioprocess Engineering Principles.* Academic Press, USA, 1995. Saterbak A., Sun, K.-Y., McIntire L.V. *Bioengineering Fundamentals.* Prentice Hall, Inc., 2007.
Other Resources	Related articles

MATERIAL SHARING	
Documents	
Homework	Presentation at the end of semester
Exams	Two midterms, one final

RATING SYSTEM		
SEMESTER WORKS	**NUMBER**	**CONTRIBUTION**
Midterm	2	30
Presentation and Final	1-1	25- 45
TOTAL		100
Success Rate of Semester		55
Success Rate of Final		45
TOTAL		100

Course Category	
Basic Sciences and Mathematics	
Engineering Sciences	x
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 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	3	48
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	2	15	30
Final	1	15	15
Total Work-Load			300
Total Work-Load / 30			300/30
Course ECTS Credit			10