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

Course Name	CODE	SEMESTER	T+L Hour	CREDIT	ECST
Artificial Organs	BENG520	FALL-SPRING	3+0	3	7,5

Prerequisite Courses

Course Type	Elective
Course Language	English
Course Coordinator	Professor Sevil D. İşoğlu
Lecturers	Professor Sevil D. İşoğlu, Assistant Professor Alper İşoğlu
Course Assistants	-
Course Objectives	Course objectives are to teach the general principles of artificial organ formation, to exemplify the functioning of organs in the body and to transfer of sample applications
Learning Outcomes	 The student, 1. learns the definition of artificial organ 2. learns principles of body mass transfer and fluid mechanics in the body 3. has knowledge about the basic component of the body 4. has knowledge about chemical reactions in the body. 5. learns the effects of artificial organs on community health. 6. has knowledge about applications such as artificial heart, kidney, lung.
Course Content	The course includes general components of the body at the organ level, engineering events at the body and artificial organ design with biomimetic approach.

WEEKLY SUBJECTS AND RELATED PRELIMINARY PAGES							
Week	Subjects	Preliminary					
1	Definition of artificial organ	Relevant Sections of Recommended Books, Scientific Publications					
2	The general principles of mass transfer, how does mass transfer in the body occur?	Relevant Sections of Recommended Books, Scientific Publications					
3	The general principles of fluid mechanics, how does fluid mechanics in the body occur?	Relevant Sections of Recommended Books, Scientific Publications					
4	The general components of the body, organ system	Relevant Sections of Recommended Books, Scientific Publications					
5	Use of biomaterials in artificial organ	Relevant Sections of Recommended Books, Scientific Publications					
6	Organ design with biomimetic	Relevant Sections of Recommended Books, Scientific Publications					
7	Artificial organs and the effect of artificial organs on community health, negative and positive effects	Relevant Sections of Recommended Books, Scientific Publications					
8	Midterm	Relevant Sections of Recommended Books, Scientific Publications					
9	Artificial organ types	Relevant Sections of Recommended Books, Scientific Publications					
10	Artificial kidney, hemodialysis	Relevant Sections of Recommended Books, Scientific Publications					

11	Artificial lung, oxygenators	Relevant Sections of Recommended Books, Scientific Publications
12	Artificial heart	Relevant Sections of Recommended Books, Scientific Publications
13	Liver substitutes	Relevant Sections of Recommended Books, Scientific Publications
14	Presentations	Relevant Sections of Recommended Books, Scientific Publications
15	Final Exam	
16		

RESOURCES

Course Notes	(a)	Artificial Organs, N.S. Hakim, 2009, Springer.
Other Resources	Scientific	articles related to the subject and videos

1

MATERIAL SHARING				
Documents -				
Homework	There will be no homework. At the end of the semester, a scientific presentation will be made related to a selected topic.			
Exams	Midterm, final exam			

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

Course Category	
Basic Sciences and Mathematics	%50
Engineering Sciences	%50
Social Sciences	

THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES AND PROGRAM COMPETENCE No Dr am Oi

No	Program Outcomes		Contribution Level				
						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					*	
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					*	
3	Choosing technical equipment used in the applications related to bioengineering, having sufficient knowledge in adopting and using new technological equipment					*	
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					*	
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				*		
6	Having advanced level of foreign language knowledge to manage efficient verbal, written and visual communication in the major field					*	
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					*	

8	Being aware of the social	al impacts of the solutions an	d applications of the cha	allenges	regarding	Bioengineering	g
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*From 1 to 5, it increasingly goes.

ECTS / WORK-LOAD TABLE						
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	80			
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			