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

Course Name	CODE	SEMESTER	T+L Hour	CREDIT	ECST
Polymeric Biomaterials	BENG517	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	General description of polymers, properties and types of polymeric biomaterials, production and characterization methods of polymeric biomaterials and their application areas with examples are aimed to be explained.
Learning Outcomes	The Student, 1. learns general properties of polymers, 2. gets to know polymeric biomaterials 3. learns synthesis, processing/shaping and characterization of polymers with the aim of biomaterial formation. 4. becomes able to design the polymeric biomaterial according to the application area in the body. 5. gains the ability to access information, to use resources accurately and effectively, and to prepare and to present project.
Course Content	General properties of polymers, classification of polymers, Natural and synthetic polymers, Natural polymer types and structures, separation and purification of natural polymers, applications (gelatin, collagen, alginate, chitosan, cellulose, starch); Synthetic polymers, synthesis-purification of synthetic polymers, applications (biodegradable polymers, silicones, PET, PTFE, PU, polyamides, polyacrylates; All applications, Dental, orthopedic, adhesive, surgical thread, artificial vessel, wound dressing, tissue engineering, drug delivery.

WEEKLY SUBJECTS AND RELATED PRELIMINARY PAGES

Week	Subjects	Preliminary

1	General properties of polymers, classification of polymers.	Relevant Sections of Recommended Books, Scientific Publications
2	Natural and synthetic polymers	Relevant Sections of Recommended Books, Scientific Publications
3	Natural polymer types and structures, separation and purification of natural polymers and applications	Relevant Sections of Recommended Books, Scientific Publications
4	Gelatin, collagen, alginate	Relevant Sections of Recommended Books, Scientific Publications
5	Chitosan, cellulose, starch	Relevant Sections of Recommended Books, Scientific Publications
6	Synthetic polymers, synthesis-purification of synthetic polymers, applications	Relevant Sections of Recommended Books, Scientific Publications
7	Biodegradable polymers, silicones, PET, PTFE, PU	Relevant Sections of Recommended Books, Scientific Publications
8	Midterm	Relevant Sections of Recommended Books, Scientific Publications
9	Polyamides, polyacrylates	Relevant Sections of Recommended Books, Scientific Publications
10	Dental, orthopedic applications	Relevant Sections of Recommended Books, Scientific Publications
11	Adhesive, surgical thread applications	Relevant Sections of Recommended Books, Scientific Publications
12	Artificial vessel, wound dressing applications	Relevant Sections of Recommended Books, Scientific Publications
13	Tissue engineering, drug delivery applications	Relevant Sections of Recommended Books, Scientific Publications
14	Presentations	Relevant Sections of Recommended Books, Scientific Publications
15	Final exam	Relevant Sections of Recommended Books, Scientific Publications

RESOURCES	
Course Notes	Lecture presentations will be given.
Other Resources	Scientific articles related to the subject

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
Homework	-	-
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	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				*	
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 impacts of the solutions and applications of the challenges regarding Bioengineering			*		

*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	16	3	48
Presentation	5	3	15
Homework	16	3	48
Midterms	1	15	15
Final	1	15	15
Total Work-Load			301
Total Work-Load / 30			301/30
Course ECTS Credit			7,5