

**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	10

**Prerequisite Courses**

<b>Course Type</b>	Elective
<b>Course Language</b>	English
<b>Course Coordinator</b>	Associate Professor Sevil D. İřođlu
<b>Lecturers</b>	Associate Professor Sevil D. İřođlu, Assistant Professor Alper İřođlu
<b>Course Assistants</b>	-
<b>Course Objectives</b>	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.
<b>Learning Outcomes</b>	The Student, <ul style="list-style-type: none"> <li>1. learns general properties of polymers,</li> <li>2. gets to know polymeric biomaterials</li> <li>3. learns synthesis, processing/shaping and characterization of polymers with the aim of biomaterial formation.</li> <li>4. becomes able to design the polymeric biomaterial according to the application area in the body.</li> <li>5. gains the ability to access information, to use resources accurately and effectively, and to prepare and to present project.</li> </ul>
<b>Course Content</b>	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
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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

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

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

<b>RATING SYSTEM</b>		
<b>SEMESTER WORKS</b>	<b>NUMBER</b>	<b>CONTRIBUTION</b>
Midterm	1	35
Homework	-	-
Presentation	1	25
Final		40
<b>TOTAL</b>		100
<b>Success Rate of Semester</b>		60
<b>Success Rate of Final</b>		40
<b>TOTAL</b>		100

<b>Course Category</b>	
Basic Sciences and Mathematics	%50
Engineering Sciences	%50
Social Sciences	

<b>THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES AND PROGRAM COMPETENCE</b>	
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.

<b>ECTS / WORK-LOAD TABLE</b>			
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
<b>Total Work-Load</b>			301
<b>Total Work-Load / 30</b>			301/30
<b>Course ECTS Credit</b>			10

