

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

Course Name	CODE	SEMESTER	T+L Hour	CREDIT	ECST
Tissue Engineering and Regenerative Medicine	BENG516	FALL-SPRING	3 + 0	3	10

<b>Prerequisite Courses</b>	---
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<b>Course Type</b>	Optional
<b>Course Language</b>	English
<b>Course Coordinator</b>	Y.Doç.Dr. Alper İšoğlu
<b>Lecturers</b>	Y.Doç.Dr. Alper İšoğlu, Y.Doç.Dr. Erkin Aydın
<b>Course Assistants</b>	
<b>Course Objectives</b>	Basic information about tissue engineering and regenerative medicine, Description of regeneration and repair in the different tissue types
<b>Learning Outcomes</b>	<p>Student</p> <ul style="list-style-type: none"> <li>• Learns tissue engineering concept and main components</li> <li>• Has knowledge about cell culture</li> <li>• Learns principles of tissue engineering applications for different organs</li> <li>• Has knowledge about regeneration and repair mechanism for tissues and organs</li> <li>• Has knowledge about clinical studies</li> </ul>
<b>Course Content</b>	Doku mühendisliği genel tanım, tamir ve yenilenme süreçleri, tedavi yaklaşımları, hücre farklılaşması ve biyosinyal moleküller, klonlamada hücresel mekanizmalar, yeni ilaç dizaynında hücresel doku modellenmesi ve yenilenmesinin temeli Tissue engineering, general definition, repair and regeneration process, treatment approaches, cell differentiation

**WEEKLY SUBJECTS AND RELATED PRELIMINARY PAGES**

Week	Subjects	Preliminary
1	Tissue engineering definition and bases	Course book and articles from the literature
2	Tissue engineering main components: cell-scaffold-biosignal molecules	Course book and articles from the literature
3	Tissue engineering repair and regeneration	Course book and articles from the literature
4	Repair and regeneration	Course book and articles from the literature
5	New treatment approaches	Course book and articles from the literature
6	Biosignal molecules	Course book and articles from the literature
7	Biosignal molecules and cell differentiation	Course book and articles from the literature
8	Cloning	Course book and articles from the literature
9	Cellular mechanism in the cloning	Course book and articles from the literature
10	Midterm exam	Course book and articles from the literature
11	New drug design	Course book and articles from the literature
12	New drug design and cellular tissue modeling	Course book and articles from the literature
13	New drug design and tissue regeneration	Course book and articles from the literature
14	Organ Tissue Engineering	Course book and articles from the literature

15	Presentations	Course book and articles from the literature
16	Final Exam	Course book and articles from the literature

#### RESOURCES

<b>Course Notes</b>	Course notes and slides
<b>Other Resources</b>	<b>Course Book:</b> "Principles of Tissue Engineering", Lanza, Langer, Vacanti, 1st Edition, 2014, Taylor&Francis.

#### MATERIAL SHARING

<b>Documents</b>	Course notes and slides
<b>Homework</b>	1 homework will be given related to subject every week.
<b>Exams</b>	1 midterm exam and 1 final exam

#### RATING SYSTEM

SEMESTER WORKS	NUMBER	CONTRIBUTION
Midterm	1	20
Homework	14	25
Quiz	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	%50
Engineering Sciences	%50
Social Sciences	%0

#### 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					<b>X</b>
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					<b>X</b>
3	Choosing technical equipment used in the applications related to bioengineering, having sufficient knowledge in adopting and using new technological equipment					<b>X</b>
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					<b>X</b>
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				<b>X</b>	
6	Having advanced level of foreign language knowledge to manage efficient verbal, written and visual communication in the major field				<b>X</b>	
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					<b>X</b>
8	Being aware of the social impacts of the solutions and applications of the challenges regarding Bioengineering					<b>X</b>

\*From 1 to 5, it increasingly goes.

#### ECTS / WORK-LOAD TABLE

Activities	Activities	Duration (Hour)	Total (Work-Load)
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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
Midterm exam	1	15	15
Final exam	1	15	15
<b>Total Work-Load</b>			301
<b>Total Work-Load / 30</b>			301/30
<b>Course ECTS Credit</b>			10