

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY
COURSE SYLLABUS

Course Details				
Code		Academic Year		Semester
MBT473		4		7
Title		T	A	L
Tissue Engineering		3	0	2
				ECTS
				6
Language		German		
Level	Undergraduate	X	Graduate	Postgraduate
Department / Program	Molecular Biotechnology			
Forms of Teaching and Learning	Face-to-face			
Course Type	Compulsory		Elective	X
Objectives	In this module, students are introduced to a wide range of tissue engineering Principles introduced, from cell biology and cell culture, to the foundations of tissue Engineering, up to 3D organoids and clinical applications of the tissue Engineering.			
Content	1) Cell biological basis 2) Signal transduction 3) Cell culture applications 4) Organ cultures, 3D cultures 5) Types of materials for scaffolding 6) Policies and Principles 7) Body systems (circulatory system, digestive system, skin, endocrine system and Metabolism) 8) Clinical Applications of Tissue Engineering 9) Gene therapy			
Prerequisites	No			
Coordinator	-			
Lecturer(s)	-			
Assistant(s)	Research Assist. Semih ALPSOY, Research Assist. Şeyma İŞ			
Work Placement	No			
Recommended or Required Reading				
Books / Lecture Notes	<ul style="list-style-type: none"> Gerhard Gstraunthaler & Toni Lindl (2021) Zell- und Gewebekultur Allgemeine Grundlagen und spezielle Anwendungen 8. Auflage ISBN 978-3-662-62605-4 Cornelia Kasper et.al (2021) Basic Concepts on 3D Cell Culture ISBN 978-3-030-66748-1 Paul Tomlins (2016) Characterisation and Design of Tissue Scaffolds ISBN: 978-1-78242-087-3 Sabine Schmitz (2011) Der Experimentator: Zellkultur 3. Auflage ISBN 978-3-8274-2572-0 			
Other Sources	-			

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Additional Course Material			
Documents	-		
Assignments	-		
Exams	-		
Course Composition			
Mathematics und Basic Sciences	-	%	
Engineering	-	%	
Engineering Design	-	%	
Social Sciences	-	%	
Educational Sciences	-	%	
Natural Sciences	100	%	
Health Sciences	-	%	
Expert Knowledge	-	%	
Assessment			
Activity	Count	Percentage (%)	
Midterm Exam	1	40	
Quiz	0	0	
Assignments	0	0	
Attendance	0	0	
Recitations	1	20	
Projects	0	0	
Final Exam	1	40	
		Total	100
ECTS Points and Work Load			
Activity	Count	Duration	Work Load (Hours)
Lectures	13	3	39
Self-Study	13	3	39
Assignments	0	0	0
Presentation / Seminar Preparation	0	0	0
Midterm Exam	1	16	16
Recitations	0	0	0
Laboratory	13	3	39
Projects	0	0	0
Final Exam	1	17	17
		Total Work Load	150

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ECTS Points (Total Work Load / Hour)		6					
Learning Outcomes							
1	Gaining knowledge about processes to create functional tissues using biological and nonbiological materials to be used in medical applications.						
Weekly Content							
1	Cell biological basis						
2	Cellular senescence in vitro / cell cultures						
3	Cell culture applications / cell culture media						
4	The extracellular matrix and its importance for the cell-matrix adhesion / receptors & signal transduction						
5	Organ cultures, 3D cultures, organoids and microphysiological systems, mechanobiology, tissue development and organ engineering						
6	In vitro control of tissue development						
7	Scaffolding for tissue engineering / types of material for tissue scaffolding						
8	Guidelines and Principles / Clinical Applications of Tissue Engineering						
9	Cardiovascular system						
10	Hematopoietic system						
11	Gastrointestinal system						
12	Musculoskeletal system and skin						
13	Endocrinology and Metabolism						
Contribution of Learning Outcomes to Program Objectives (1-5)							
	P1	P2	P3	P4	P5	P6	P7
1	5	5	5	5	-	5	-
Contribution Level		1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High					
https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=en&curSunit=5707							
Compiled by:		Research Assist. Aysel Oktay					
Date of Compilation:		14.08.2023					