

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
GENETICS and BIOTECHNOLOGY	MKBD1121950	Fall Semester	4+0	4	8
<b>Prerequisites Courses</b>					
<b>Recommended Elective Courses</b>					
<b>Language of Instruction</b>	Turkish				
<b>Course Level</b>	Third Cycle (Doctorate Degree)				
<b>Course Type</b>	Elective				
<b>Course Coordinator</b>	Assist.Prof. Neşe AYŞİT				
<b>Name of Lecturer(s)</b>	Prof.Dr. Cafer MARANGOZ, Prof.Dr. İlkur KESKİN, Assoc.Prof. Ayşe Arzu ŞAKUL, Assoc.Prof. Sultan Sibel ERDEM, Assist.Prof. Kıvanç KÖK, Assoc.Prof. Nihal KARAKAŞ, Prof.Dr. Yasemin YÜKSEL DURMAZ, Assist.Prof. Elif Zeynep YILMAZ, Assist.Prof. Bilgesu Onur SUCU				
<b>Assistant(s)</b>					
<b>Aim</b>	The aim of this course is to provide students with a broad perspective in the fields of genetics and biotechnology and to understand modern biotechnological applications.				
<b>Course Content</b>	This course contains; Molecular Biology of Gene (general definitions, DNA modifications, epigenetics),Molecular Biology of Gene (general definitions, DNA modifications, epigenetics),Regulation of gene expression,Human genetics,Systems Biology (omic technologies),Systems Biology (omic technologies),Bioinformatics,Recombinant DNA technology (cloning, gene editing, transgenic technology),Labelling and quantification of biological structures and molecules,Biological imaging,Drug Development (small molecules),Drug development (biosimilars, nanoparticles, tissue and cell targeting),Biomaterials,Use of biotechnology in medicine.				
<b>Course Learning Outcomes</b>			<b>Teaching Methods</b>	<b>Assessment Methods</b>	
Explains the principles of systems biology and where and how to use omics technologies.			10, 16, 9	A, E	
Explain the general definitions of molecular biology of gene, DNA modifications and epigenetic mechanisms.			10, 16, 9	A, E	
Describes the mechanisms of regulation of gene expression, genetic regulation.			10, 16, 9	A, E	
Evaluates the use of bioinformatics tools for the analysis of biological data.			10, 16, 9	A, E	
Explains the basic principles of recombinant DNA technology, cloning, gene editing and transgenic technology.			10, 16, 9	A, E	
Determines drug development and biological imaging techniques.			10, 16, 9	A, E	
Evaluates the use of biotechnology in the field of medicine.			10, 16, 9	A, E	
<b>Teaching Methods</b>	10: Discussion Method, 16: Question - Answer Technique, 9: Lecture Method				
<b>Assessment Methods</b>	A: Traditional Written Exam, E: Homework				
<b>Lecture Schedule</b>					
<b>Sequence</b>	<b>Topics</b>	<b>Preliminary Preparation</b>			
1	Molecular Biology of Gene (general definitions, DNA modifications, epigenetics)	Instructor's lecture notes			
2	Molecular Biology of Gene (general definitions, DNA modifications, epigenetics)	Instructor's lecture notes			
3	Regulation of gene expression	Instructor's lecture notes			
4	Human genetics	Instructor's lecture notes			
5	Systems Biology (omic technologies)	Instructor's lecture notes			
6	Systems Biology (omic technologies)	Instructor's lecture notes			
7	Bioinformatics	Instructor's lecture notes			
8	Recombinant DNA technology (cloning, gene editing, transgenic technology)	Instructor's lecture notes			
9	Labelling and quantification of biological structures and molecules	Instructor's lecture notes			
10	Biological imaging	Instructor's lecture notes			
11	Drug Development (small molecules)	Instructor's lecture notes			
12	Drug development (biosimilars, nanoparticles, tissue and cell targeting)	Instructor's lecture notes			
13	Biomaterials	Instructor's lecture notes			
14	Use of biotechnology in medicine	Instructor's lecture notes			
<b>Evaluation Methods</b>			<b>Weight(%)</b>		
Midterm Exam			50		
General Exam			50		

Resources
The instructor's lecture notes are given to the student.e-kaynak