

**ABDULLAH GÜL UNIVERSITY  
BIOENGINEERING PROGRAM  
COURSE PLAN**

Course unit title	Code	Semester	T+P Hours	Credits	ECTS
Molecular Basis of Diseases	BENG542	FALL&SPRING	3 + 0	3	7,5

<b>Prerequisite</b>	Have already obtained a Genetic course
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<b>Type of course</b>	Selective
<b>Language</b>	English
<b>Course coordinator</b>	Ass. Prof. Dr. Oktay I. Kaplan
<b>Lecturer</b>	Ass. Prof. Dr. Oktay I. Kaplan
<b>Course TA</b>	-
<b>Objectives of the course</b>	The main aim of this course is to provide an insight into the molecular mechanisms underlying human disease processes and help the development of targeted therapies and drugs.
<b>Learning outcomes</b>	To provide an opportunity for students to: <ul style="list-style-type: none"> <li>1. learn genetics and biochemical processes leading to a range of diseases;</li> <li>2. learn the molecular details of protein folding diseases;</li> <li>3. learn the modeling human diseases;</li> <li>4. learn diseases caused by enzyme deficiency;</li> <li>5. learn how the immune system works and autoimmune diseases;</li> </ul>
<b>Course content</b>	Diabetes, Cancer, Infectious Diseases, Parkinson's, Alzheimer's, Silyopathy, Cystic Fibrosis, Rare Diseases, Autoimmune Diseases

<b>WEEKLY DETAILED COURSE CONTENT</b>		
Week	Subject	Self-preparation
1	Introduction to Cancer	Corresponding parts in the textbooks, scientific articles.
2	Diabetes and Obesity	Corresponding parts in the textbooks, scientific articles.
3	Neurodegenerative Diseases; especially those related to protein misfoldings I: Alzheimer's and Parkinson's diseases	Corresponding parts in the textbooks, scientific articles.
4	Neurodegenerative Diseases; especially those related to protein misfoldings II: Prion and Creutzfeldt-Jakob disease	Corresponding parts in the textbooks, scientific articles.
5	Autoimmune Diseases I	Corresponding parts in the textbooks, scientific articles.
6	Autoimmune Diseases II	Corresponding parts in the textbooks, scientific articles.
7	Muscle Diseases: Duchenne Muscular Dystrophy and SMA, Midterm exam	Corresponding parts in the textbooks, scientific articles.
8	Lysosomal diseases	Corresponding parts in the textbooks, scientific articles.
9	MIDTERM	
10	Mitochondrial Diseases	Corresponding parts in

		the textbooks, scientific articles.
11	Genetic Disease Modeling, Gene Therapy and Gene Editing	Corresponding parts in the textbooks, scientific articles.
12	Cystic Fibrosis	Corresponding parts in the textbooks, scientific articles.
13	Cilia and Ciliopathy	Corresponding parts in the textbooks, scientific articles.
14	Co Complex Genetic Diseases: Atherosclerosis	Corresponding parts in the textbooks, scientific articles.
15	Infectious Diseases: HIV, H. pylori	Corresponding parts in the textbooks, scientific articles.
16	Genetic Techniques and New Generation Sequencing, Final Exam	Corresponding parts in the textbooks, scientific articles.

#### SOURCES

<b>Textbooks</b>	(a) William B. Coleman (Editor), Gregory J. Tsongalis.(2009), Molecular Pathology: The Molecular Basis of Human Disease (b) Undurti Narasimha Das, (2011), Molecular Basis of Health and Disease
<b>Other materials</b>	Scientific articles on the molecular basis of disease

#### SHARING MATERIALS

<b>Documents</b>	-
<b>Home works</b>	4 home works
<b>Exams</b>	Midterm, final

#### SYSTEM OF EVALUATION

SEMESTER WORK	Quantity	Weight, %
Midterm	1	30
Quiz	0	0
Home works	1	30
Final	1	30
<b>TOTAL</b>		100
<b>Contribution of Term (year) Learning Activities to Success Grade</b>		70
<b>Contribution of Final Exam to Success Grade</b>		30
<b>TOTAL</b>		100

#### Category

Basic Sciences and human health	x
Engineering Sciences	
Social Sciences	

#### RELATIONSHIP BETWEEN COURSE LEARNING OUTCOMES AND PROGRAM QUALIFICATIONS

No Program Competencies	Contribution Level				
	1	2	3	4	5
1 Understanding of Life Sciences, Mathematics and Engineering at the post-graduate level,					x

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

\*1'den 5'e kadar artarak gitmektedir.

<b>ECTS / WORK LOAD TABLE</b>			
Activities	Quantity	Duration (hour)	Total Work Load (hour)
Lectures (Including exam weeks: 16x total hour duration)	16	3	48
Out-Class Activities (Self-learning, enhancement)	16	5	80
Reading			
Searching in Internet, working in library	16	5	80
Material design, application			
Preparation of reports			
Preparation for presentations			
Presentations			
Home works	8	8	64
Midterms	1	14	14
Semester Final Exams	1	16	16
<b>Total Work Load</b>			302
<b>Total Work Load / 30</b>			302/30
<b>ECTS Credits</b>			7,5