International School of Medicine / Medicine (English)

2023 - 2024 Academic Year

MEDICAL BIOLOGY & GENETICS

Syllabus

Course Description					
Name	**Code**	**Semester**	**T+A Hour**	**Credit**	**ECTS**
MEDICAL BIOLOGY & GENETICS	ISM1014671	Yearly	44+10	0	4

Prerequisites Courses	
Recommended Elective Courses	None
Language of Instruction	English
Course Level	First Cycle (Bachelor's Degree)
Course Type	Committee Course
Course Coordinator	Assoc.Prof. Nihal KARAKAŞ
Name of Lecturer(s)	Assist.Prof. Sven Pierre L. VILAIN, Assist.Prof. Berrak ÇAĞLAYAN, Prof.Dr. Esra ÇAĞAVİ, Assist.Prof. Salih GENCER, Assoc.Prof. Nihal KARAKAŞ, Assist.Prof. Yasemin YOZGAT BYRNE
Assistant(s)	None
Aim	The aim of this course is to define and evaluate the fundamental concepts in medical biology and medical genetics, that will lay the foundation for first year medical students for understanding of basic cellular mechanisms as well as associating the dysfunctional molecular mechanisms with human diseases.
Course Content	This course contains; Fundamentals of life - the cell,Chemical principles of the cell biology and biosynthesis,Protein structure and function,Genetic material of the cell - DNA, chromosomes and the genome,DNA replication and repair,RNA structure and transcription,Genetic code and tranlation,Control of gene expression and genetic switches-I,Control of gene expression and genetic switches-II,Epigenetics and epigenome,Molecular techniques and clinical applications,The structure and function of cellular membranes and transport across the membrane,Cellular compartments: Organelles-I,Cellular compartments: Organelles-II,Cellular compartments: Organelles-III,Vesicular transport within the cell,Endocytosis, exocytosis and membrane transport,Cell Signaling -I,Cell Signaling -II,Cytoskeleton and motor proteins,Cell adhesion, junctions and extracellular matrix,Cell cycle,Cell senescence and cell death,Developmental biology and organ regeneration,Stem cells and regenerative medicine,Cancer biology and molecular basis of cancer,Current therapeutic approaches and cancer therapy,Fundamentals of medical genetics,Mendelian/non-mendelian/population genetics,Principles of autosomal genetic inheritance,Principles of genetic inheritance sex chromosomes,Gonosomal and autosomal chromosomal abnormalities,Prenatal testing and genetic counseling.

Course Learning Outcomes	**Teaching Methods**	**Assessment Methods**
This course is to define and evaluate the fundamental concepts in medical biology and medical genetics, that will lay the foundation for first year medical students for understanding of basic cellular mechanisms as well as associating the dysfunctional molecular mechanisms with human diseases.	10, 12, 14, 16, 17, 19, 3, 37, 4, 9	A, E, G

Teaching Methods	10: Discussion Method, 12: Problem Solving Method, 14: Self Study Method, 16: Question - Answer Technique, 17: Experimental Technique, 19: Brainstorming Technique, 3: Problem Baded Learning Model, 37: Computer-Internet Supported Instruction, 4: Inquiry-Based Learning, 9: Lecture Method
Assessment Methods	A: Traditional Written Exam, E: Homework, G: Quiz

Lecture Schedule

Sequence	**Topics**	**Preliminary Preparation**
1	Fundamentals of life - the cell	
2	Chemical principles of the cell biology and biosynthesis	
3	Protein structure and function	
4	Genetic material of the cell - DNA, chromosomes and the genome	
5	DNA replication and repair	
6	RNA structure and transcription	
7	Genetic code and tranlation	
8	Control of gene expression and genetic switches-I	
9	Control of gene expression and genetic switches-II	
10	Epigenetics and epigenome	
11	Molecular techniques and clinical applications	
12	The structure and function of cellular membranes and transport across the membrane	
13	Cellular compartments: Organelles-I	
14	Cellular compartments: Organelles-II	
15	Cellular compartments: Organelles-III	
16	Vesicular transport within the cell	
17	Endocytosis, exocytosis and membrane transport	
18	Cell Signaling -I	
19	Cell Signaling -II	
20	Cytoskeleton and motor proteins	
21	Cell adhesion, junctions and extracellular matrix	
22	Cell cycle	
23	Cell senescence and cell death	
24	Developmental biology and organ regeneration	
25	Stem cells and regenerative medicine	
26	Cancer biology and molecular basis of cancer	
27	Current therapeutic approaches and cancer therapy	
28	Fundamentals of medical genetics	
29	Mendelian/non-mendelian/population genetics	
30	Principles of autosomal genetic inheritance	
31	Principles of genetic inheritance sex chromosomes	

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Lecture Schedule		
Sequence	**Topics**	**Preliminary Preparation**
32	Gonosomal and autosomal chromosomal abnormalities	
33	Prenatal testing and genetic counseling	

Evaluation Methods	Weight(%)
Midterm Exam	40
General Exam	60

Resources
Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander D Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter "Essential Cell Biology" Fifth Edition, Garland Science Publishers, USA, 2019.1. Presentations of lecture notes 2. Alberts, Bray, Hopkin, Johnson, Lewis, Raff, Roberts, Walter "Essential Cell Biology" Fifth Edition, Garland-Norton Publishers, USA, 2019. 3. Alberts, Johnson, Lewis, Raff, Roberts, Walter "Molecular Biology of the Cell" Seventh Edition, Garland Science Publishers, USA, 2015. 4. Stephen R Goodman "Medical Cell Biology", Third Edition, Elsevier, USA, 2007.