

International School of Medicine / Medicine (English)

2023 - 2024 Academic Year

BIOCHEMISTRY

Syllabus

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
BIOCHEMISTRY	ISM1014667	Yearly	74+10	0	6
Prerequisites Courses					
Recommended Elective Courses					
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Committee Course				
Course Coordinator	Assoc.Prof. Sultan Sibel ERDEM				
Name of Lecturer(s)	Assoc.Prof. Sultan Sibel ERDEM, Assoc.Prof. Saime BATIREL, Assist.Prof. Nihan VERİMLİ				
Assistant(s)	Assoc. Prof. S. Sibel ERDEM				
Aim	The aim of this course is Describe the structure, organisation and functions of living matter in molecular terms. How do their interactions lead to the assembly of organized macro molecular structures.				
Course Content	This course contains; Molecular fundamental of life,Bioenergy:carbohydrate metabolism ,Energy storage:Glycogen synthesis and catabolism ,Energy production: Glycolysis ,Energy transformation I: Citric acid cycle ,Pendose phosphate pathway ,Glucose biosynthesis:Glycogenesis,Metabolic control of glucose,Lipids and fatty acids,Oxidation of fatty acids,Blood glucose assay,Lipoproteins,Sphingolipids ,Steroids,Lipogenesis ,Membrane and transport ,Oxidative phosphorylation ,Biologic oxidation and antioxidants ,Enzymes and enzyme regulations,Signal transduction ,Structure of hormones,Mechanism action of hormone,Structure of vitamins,Mechanism action of vitamins,Inorganic molecules (1),Inorganic molecules (2),Amino acids and properties,Biosynthesis and catabolism of amino acids,Biologic amines,Urea synthesis,Structure of proteins,Clasifications of proteins,Globuler protein (Hemoglobine),Proteins analysis methods,Nutritional biochemistry,Nucleic acids,Buffer systems,Body fluids,Water metabolism.				
Course Learning Outcomes			Teaching Methods	Assessment Methods	
1.1.Solve structure , digestion and absorption of carbohydrates, lipids and proteins.			16, 17, 19, 9	A, D, E, G	
1.2.Categorize and compare the macro and micro minerals.			16, 17, 19, 9	A, D, E, G	
1.3.Compare and question the hormones and enzymes.			16, 17, 19, 9	A, D, E, G	
1.4.Understand the structure and functions of vitamins.			16, 17, 19, 9	A, D, E, G	
2-Question the function of macromolecules in the cell and understand insufficient dietary quantities of even one vitamin or amino acid can quickly limit the synthesis and lower the body level of many essential proteins.			16, 17, 19, 9	A, D, E, G	
2.1.Solve the important of structure of carbohydrates within the cell and cell membrane.			16, 17, 19, 9	A, D, E, G	
3-Question the relationship between macromolecules and energy.			16, 17, 19, 9	A, D, E, G	
3.1.Question the metabolic fate of glucose.			16, 17, 19, 9	A, D, E, G	
3.2.Solve the relationship between biological oxidation and fatty acids breaks down and synthesis.			16, 17, 19, 9	A, D, E, G	
3.3.Question the de novo synthesis of glucose and fatty acids.			16, 17, 19, 9	A, D, E, G	
3.4.Interpret the proteins in the energy production.			16, 17, 19, 9	A, D, E, G	
3.5.Question the electron transport chain.			16, 17, 19, 9	A, D, E, G	
4-Compare the relationship of body fluids.			16, 17, 19, 9	A, D, E, G	
4.1.Solve the properties of urine and relate the kidney functions.			16, 17, 19, 9	A, D, E, G	
4.2.Demonstrate the blood pH and buffer systems.			16, 17, 19, 9	A, D, E, G	
4.3.Question the saliva and other body fluids.			16, 17, 19, 9	A, D, E, G	
4.4.Interpret the important of water in the metabolism.			16, 17, 19, 9	A, D, E, G	
5-Reach the printed and electronic information sources			16, 17, 19, 9	A, D, E, G	
6-With these information, develop analytical thinking and concepts.			16, 17, 19, 9	A, D, E, G	
1. Compare the structure of macro molecules in the organism.			16, 17, 19, 9	A, D, E, G	
2.2. Solve the important lipids within the cell and cell membrane.			16, 17, 19, 9	A, D, E, G	
2.3. Question of proteins within the cell and cell membrane.			16, 17, 19, 9	A, D, E, G	
2.4. Compare the macrominerals in the metabolism.			16, 17, 19, 9	A, D, E, G	
2.5. Compare the effect of hormone, enzyme and vitamins on the proteins, carbohydrates and lipids.			16, 17, 19, 9	A, D, E, G	
Teaching Methods	16: Question - Answer Technique, 17: Experimental Technique, 19: Brainstorming Technique, 9: Lecture Method				
Assessment Methods	A: Traditional Written Exam, D: Oral Exam, E: Homework, G: Quiz				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	Molecular fundamental of life	references 1,2,3,4,5			
2	Bioenergy:carbohydrate metabolism	references 1,2,3,4,5			
3	Energy storage:Glycogen synthesis and catabolism	references 1,2,3,4,5			
4	Energy production: Glycolysis	references 1,2,3,4,5			
5	Energy transformation I: Citric acid cycle	references 1,2,3,4,5			
6	Pendose phosphate pathway	references 1,2,3,4,5			
7	Glucose biosynthesis:Glycogenesis	references 1,2,3,4,5			
8	Metabolic control of glucose	references 1,2,3,4,5			
9	Lipids and fatty acids	references 1,2,3,4,5			
10	Oxidation of fatty acids	references 1,2,3,4,5			
11	Blood glucose assay	references 1,2,3,4,5			
12	Lipoproteins	references 1,2,3,4,5			
13	Sphingolipids	references 1,2,3,4,5			
14	Steroids	references 1,2,3,4,5			
15	Lipogenesis	references 1,2,3,4,5			

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16	Membrane and transport	references 1,2,3,4,5
17	Oxidative phosphorylation	references 1,2,3,4,5
18	Biologic oxidation and antioxidants	references 1,2,3,4,5
19	Enzymes and enzyme regulations	references 1,2,3,4,5
20	Signal transduction	references 1,2,3,4,5
21	Structure of hormones	references 1,2,3,4,5
22	Mechanism action of hormone	references 1,2,3,4,5
23	Structure of vitamins	references 1,2,3,4,5
24	Mechanism action of vitamins	References 1,2,3,4,5
25	Inorganic molecules (1)	references 1,2,3,4,5
26	Inorganic molecules (2)	references 1,2,3,4,5
27	Amino acids and properties	references 1,2,3,4,5
28	Biosynthesis and catabolism of amino acids	references 1,2,3,4,5
29	Biologic amines	References 1,2,3,4,5
30	Urea synthesis	references 1,2,3,4,5
31	Structure of proteins	references 1,2,3,4,5
32	Classifications of proteins	references 1,2,3,4,5
33	Globular protein (Hemoglobin)	references 1,2,3,4,5
34	Proteins analysis methods	references 1,2,3,4,5
35	Nutritional biochemistry	references 1,2,3,4,5
36	Nucleic acids	references 1,2,3,4,5
37	Buffer systems	references 1,2,3,4,5
38	Body fluids	references 1,2,3,4,5
39	Water metabolism	references 1,2,3,4,5
Evaluation Methods		Weight(%)
Midterm Exam		40
General Exam		60

Resources
<input type="checkbox"/> 1.Experimental Biochemistry for Medical Sciences (Türkan Yiğitbaşı,S.Sibel Erdem,Perinur Bozaykut, Nesrin Emekli), 2.Lippincott Biochemistry, 3.Harper's Biochemistry, 4.Lehninger Principles of Biochemistry, 5.Henry's Clinical Diagnosis and Management by Laboratory Methods.