AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Advanced Biochemistry								
Course Code	BYK620		Couse Level		Third Cycle (Doctorate Degree)				
ECTS Credit	5	Workload	125 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	To provide a broad-based background in laboratory science by drawing attention to the latest techniques in biochemistry.								
Course Content	Amino acids and peptides - Structure and function of proteins- Clarification of protein structure- Myoglobin and hemoglobin - Connective tissue proteins - General properties of enzymes - Enzyme kinetics - Regulation of enzyme activity - Carbohydrate and Lipid Metabolism - Classification of carbohydrates - the digestion and absorption of carbohydrates - Glycolysis - Citric acid cycle - Oxidative forsorilasyon - Gluconeogenesis - The pentose phosphate pathway - Glycogen Metabolism - Classification of lipids - Fatty acid synthesis and oxidation - Classification of Steroids-lipids digestion, absorption and transport - Lipoproteins and lipoprotein metabolism disorders- Amino acid metabolism and protein synthesis - the digestion and absorption of proteins - Amino acid degradation and urea cycle- Catabolism of the carbon skeletons of amino acids - Porphyrins and bile pigments - the metabolism of purine and pyrimidine nucleotides - genetic information - DNA structure - replication and repair - Gene regulation - Recombination - RNA Synthesis - Protein synthesis - Gene expression control - Hormones - Vitamins - Trace Elements and Nutrition- The mechanism of action of hormones - Thyroid and parathyroid hormones - Androgens - Estrogens and progesterone - The adrenal gland hormones - Pancreatic hormones - Fat-soluble vitamins - Water-soluble vitamins - Trace elements - Basic principles of nutrition.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Problem Solving								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading	
1	Biochemistry by lehninger
2	Biochemistry :Mary K. Campbell
3	Keshav Trehan Biyokimya

Week	Weekly Detailed Course Contents	
1	Theoretical	The role of water in cell biology
2	Theoretical	Molecular structures and reasoning at atomic level in biology. Historical overview
3	Theoretical	Biological macromolecules, three-dimensional conformation, weak interactions and their importance in life, biological macromolecules in hydrophobic and hydrophilic environments, symmetry, macromolecules and structures
4	Theoretical	Protein design, sequence, secondary structure, super secondary structures, structural centers, tertiary structure, protein-protein relationship
5	Theoretical	Protein folding & protein stability
6	Theoretical	Enzymes: 3D structures and activities
7	Theoretical	Membrane proteins, hydrophobicity and protein-lipid interactions, Energy & Signal transmission- Molecular machines, Atomic level selected model systems (high resolution structures and bacteriododsin, rhodopsin to determine the possible functions)
8	Intermediate Exam	Advanced Biochemistry Midterm Exam
9	Theoretical	Structural proteins, collagen, super helixes, silk, amyloids, amyloidosis, biopolymers / biomaterials
10	Theoretical	Nucleic acids: structure & function
11	Theoretical	DNA-binding proteins, protein-DNA recognition in eukaryotic and prokaryotic organisms
12	Theoretical	Protein-DNA interactions Supercatated DNA, Nucleosome structure
13	Theoretical	Carbohydrates: structure & function
14	Theoretical	Polysaccharides (Chitin, Cellulose) & two-phase protein-polysaccharide complex systems
15	Theoretical	Lipid chemistry and biological membranes

16	Final Exam	Advanced Biochemistry Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	2	84
Midterm Examination	1	18	2	20
Final Examination	1	19	2	21
			Total Workload (Hours)	125
			[Total Workload (Hours) / 25*] = **ECTS**	5
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To be able to read the scientific literature and interpret the information about biomolecular structure and function
2	To discuss the relationship between biomolecular structure and function
3	Being able to cooperate as a team employee and improve herself/himself by following the innovations in science(
4	To be able to understand the combination of structural and functional properties of amino acids, proteins, carbohydrates, nucleotides, lipids and membranes
5	To be able to use modern library search and information methods to obtain information about the structure and function of biomolecules

Programme Outcomes *(Biochemistry (Medical) Doctorate)*	
1	To have basic theoretical knowledge about biochemistry and to help understanding biochemistry
2	To have the basic laboratory knowledge, apparatus and methods used in biochemistry
3	Analysis: To be able to analyze information critically
4	Synthesis: To be able to synthesize and adapt the knowledge in the field from different directions
5	Evaluation: To critically evaluate research in the field

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	5	5	5	5	5
P2	4	5	4	4	5
P3	5	4	5	5	4
P4	4	5	5	4	5
P5	5	4	4	5	4