



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Lipid and Membrane Biochemistry							
Course Code		BYK626		Couese Level		Third Cycle (Doctorate Degree)			
ECTS Credit	5	Workload	125 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The aim of this course is to give the basic knowledge about the structure and function of lipids and biological membranes.							
Course Content		Lipids, fatty acids, triacylglycerols, phosphoacylglycerols, soaps, Sphingolipids, glycolipids, steroids, cholesterol, Biological Membranes and Membrane Receptors, fluid Mosaic membrane Model and Transport							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion					
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 of Lipids, Lipoproteins and Membranes: J.E. Vance, Dennis E. Vance
2	Lipid Biochemistry: An Introduction : Michael I. Gurr, John L. Harwood, Keith N. Frayn

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction to biological membranes, basics of membrane structure
2	Theoretical	Lipid components of membranes; classification and chemical properties of lipids, lipid composition, monolayer, bilayer, micelles, liposomes and biomembranes
3	Theoretical	Protein components of membranes; type, structure, arrangement and properties of membrane proteins
4	Theoretical	Hydropathy curves and prediction of secondary structure, folding of membrane proteins
5	Theoretical	Dynamics of membrane proteins, rotational and translational diffusion, measurement techniques
6	Theoretical	Protein-lipid interactions and membrane function
7	Theoretical	Transport from membranes, electron transport management systems, carriers, channels
8	Intermediate Exam	Lipid and Membrane Biochemistry Midterm Exam
9	Theoretical	H ⁺ transport by mitochondrial respiration chain, chemiosmotic theory, proton transport with complexes
10	Theoretical	Light-mediated H ⁺ transport, H ⁺ transport in tilacoids, bacterial photosynthetic reaction center, bacteriorhodopsin
11	Theoretical	F-, V-, P-type ATPases and ATP synthesis, structure and molecular mechanism of F-type ATPases
12	Theoretical	Primary ion pumps and ionic gradient formation, structure and function of P-type ATPases, ABC-transporters
13	Theoretical	Carrier transport, molecular mechanism
14	Theoretical	Biological overview of channel functions, ion channels, ion-carrying and ion-forming channels
15	Theoretical	Ligand gated and voltage gated channels, water channels, aquaporins and types
16	Final Exam	Lipid and Membrane 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 understand and compare the chemical composition of membranes
2	To understand the basic processes of membrane biogenesis
3	To understand the membrane dynamics in the cell
4	To be able to comprehend and compare the types and characteristics of membrane proteins in the cell membrane
5	To be able to explain the different ways of transporting solutes and water through membranes

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	4	5	4
P4	4	5	5	5	4
P5	5	5	5	4	5

