



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Proteins Structures and Functions							
Course Code		ZBY506		Course Level		Second Cycle (Master's Degree)			
ECTS Credit	8	Workload	201 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The fundamental outcome of this course is to enable students comprehend the relationships between protein structures and functions on atomic level while doing these they will acquire the means of visualizing and manipulating protein 3D structures. This course will also introduce them to in silico rational drug design concept widely exploited by structure based biotech companies seeking novel chemicals to target cancer, neurologic disorders etc.							
Course Content		This course includes that information about structural and functional relationship of proteins at molecular level; problem solving on novel areas such as rational drug design; analyzing and manipulating the chemical and physical interactions between groups and atoms functional in assuming the different hierarchical organization levels of protein structure.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration, Discussion, Individual Study					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	60
Assignment	1	10
Project	1	10

Recommended or Required Reading

1	Protein Structure and Fuction, Petsko G, A and Ringe D; Introduction to protein structure, Branden C; Introduction to Protein Architecture, Lesk A, M; Lehninger Principles of Biochemistry, David L. Nelson, Michael M. Cox. M. Cox
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Week	Weekly Detailed Course Contents	
1	Theoretical	Structural Genomics and Proteomiks
2	Theoretical	Structure determination; X-Ray crystallography and NMR interpretation of structural information
3	Theoretical	Importance and determinants of secondary structure. Properties of alpha helix and beta sheets. Prediction of secondary structure
4	Theoretical	Tertiary structure and stability. Weak interactions, Protein flexibility
5	Theoretical	Control of protein function. Mechanism of regulation
6	Theoretical	The structural basis of protein function.
7	Theoretical	Control of protein function. Mechanism of regulation
8	Intermediate Exam	Midterm exam
9	Theoretical	Motor protein switches. Protein degradation and other regulatory modifications.
10	Theoretical	Strategies for determining binding sites and catalytic residues.
11	Theoretical	Homology modeling, profile based threading and ab-initio modeling
12	Theoretical	Analyzing and manipulating protein structure for ligand binding sites and catalytic sequences
13	Theoretical	Techniques for probing the functions of proteins
14	Theoretical	Fusion proteins
15	Theoretical	Relations of Amino asit structure and protein function
16	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	9	3	168
Assignment	2	8	1	18
Midterm Examination	1	6	1	7



Final Examination	1	7	1	8
Total Workload (Hours)				201
[Total Workload (Hours) / 25*] = ECTS				8
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	Distinguish the structural and functional relationship of proteins at molecular level
2	Apply his/her structural knowledge and ability to problem solving capacity to novel areas such as rational drug design
3	Analyze and manipulate the chemical and physical interactions between groups and atoms functional in assuming the different hierarchical organization levels of protein structure with the aid of DeepView program and use this it to design economic and effective wet lab experiments
4	Get knowledge about protein synthesis
5	To be able to search information about protein structure functions at academic level

Programme Outcomes (Agricultural Biotechnology Master)

1	Students learn various techniques and evaluates resources about agricultural biotechnology
2	Make the necessary projects in agricultural biotechnology and to conduct a study of the basic level independently
3	Students learns how to conduct a scientific research and prepares themselves for the scientists in the direction of their ideals.
4	Students may reveal new ideas in social and scientific issues and can benefit from the ideas and produce something new winning independent and teamwork skills.
5	Students can use its products for the benefit of humanity, they can produce technology and collaborate with industry

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	4	4
P2	5	5	5	3	3
P3	5	4	5	4	2
P4	3	4	3	3	4
P5	2	5	2	2	5

