AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Introductio to Protein Structure Modeling								
Course Code	TBY419		Couse Level	First Cycle (Bachelor's Degree)					
ECTS Credit	4	Workload	105 *(Hours)*	Theory	2	Practice	0	Laboratory	2
Objectives of the Course	Proteins are one of the main research areas of Biotechnology. Unlike the other macromolecules, proteins are synthesized directly according to their genetic information of every living things.Thus, structural and functional comparation of proteins provides some important knowledge for understanding of similar and different features amoung various organisms. The basic information and bioinformatics data for protein structures and functions are given to students in several courses. In this course, it is aimed that student will be taught three-dimensional protein modelling and comparative structure analysis. This course aimed to provide the students some knowledge and skills for transferring of basic information of proteins to visual aids, visual comparison of bioinformatic data, and the basic concepts of the subject.								
Course Content	Physical and biochemical features of amino acids, roles of the radical groups in protein structure and function, characteristics of protein structures and functions, motifs-signatures and patterns in protein structures, roles/effects of these special formations in protein structure and function, bioinformatik tools for three-dimensional protein modelling, internet-based and computere-based programmes, basic information for molecular modelling, presentation approaches of 3D protein structures and surfaces, experimental methods and technics for exploration a protein 3D structure, processes leading from a sequence to the 3D structure, associating the experimental design and in silico analysis.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Project Based Study, Individual Study								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	50
Practice	1	20

Recommended or Required Reading	
1	1- Molecular Modelling, Second Edition, Andrew R. Leach
2	2- Biyokimya İlkeleri – Lehninger, ISBN: 975-8982-18-4, Yazar: David L. Nelson , Micheal M. Cox, Çeviri Editörü: Nedret Kılıç
3	3- Harper'ın Biyokimyası, Yazar: Murray, Bender, Weil, Botham, Kennely, Rodwell, Çevirmen: Prof. Dr. Gül Güner Akdoğan, Prof.Dr. Biltan Ersöz, Prof. Dr. Nevbahar Turgan, Yayınevi: Nobel Tip Kitabevi ISBN: 9786053351542
4	4- Homology Modeling: Methods and Protocols, Editörler: Andrew J. W. Orry, Ruben Abagyan, Yayıncı Humana Press, 2012 ISBN 1617795879, 9781617795879
5	5- In-Silico Analysis And Homology Modeling Proteins With MYMIV, Yazar: Navneet Kumar Yadav, Editör: Navneet Kumar Yadav, Yayıncı: Lap Lambert Academic Publishing GmbH KG, 2012 ISBN 3846549541, 9783846549544

Week	Weekly Detailed Course Contents	
1	Theoretical	Basic concepts in Molecular Modelling
2	Theoretical	Amino acid Biochmistry and Radical groups
3	Theoretical	Protein Biochemistry and Special formations
4	Theoretical	Empirical Force Fields Models
5	Theoretical	Biochemical bonds in Protein structure analysis
6	Theoretical	İdeal protein structures and Energy Minimisation Princibles
7	Practice	Bioinformatic resources in Protein structure Modelling
8	Practice	Computer-based Protein 3D structure analysis Programmes
9	Practice	Integration of internet-based tools and computer-based programmes
10	Practice	Methods and Technics used in protein structure analysis
11	Practice	Comparative analysis from sequence to 3D structure
12	Practice	Mutations and comparative analysis
13	Practice	Associating of homology modelling and wet-lab analysis

14	Theoretical	General overview

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	2	42
Lecture - Practice	7	2	2	28
Assignment	7	2	2	28
Midterm Examination	1	2	1	3
Final Examination	1	3	1	4
			Total Workload (Hours)	105
			[Total Workload (Hours) / 25*] = **ECTS**	4
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	1. Learn Amino acid structure, radıcal groups and their roles in protein structures.
2	2. Learn protein structure, the special formations in this structure and obtain some important information to analys proteins.
3	3. Learn some biochemical concepts important for protein structure and function.
4	4. Learn protein-oriented bioinformatik tools and PC-based programmes.
5	5. Obtain general overview and experience to transfer designs from bioinformatic tools and in silico analysis to wet-lab studies.
6	6. Able to analize and evaluate the effects of a mutation to protein structure and function or design such a scenario.

Programme Outcomes *(Agricultural Biotechnology)*	
1	To be able to develop skills in identifying, modeling and solving problems in agricultural biotechnology
2	To be able to synthesize life and engineering sciences for the effective resource planning of agricultural biotechnology applications
3	To be able to interpret about living organisms structure, metabolic and physiological processes in order to propose biotechnological solutions to the agricultural problems
4	To be able to analyze genomic, metabolomic and proteomic information via bioinformatic tools.
5	To have the ability to analyze collected data and interpret the results.
6	To have the ability of individual working ability and to make independent decisions, to work in inter-disciplinary and interdisciplinary teamwork, to communicate by expressing their ideas orally and in writing, clearly and concisely
7	To have the awareness of professional liabilities and ethics
8	To be able to follow current national and international problems

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

	L1	L2	L3	L4	L5	L6
P1	4	4	2	2	5	5
P2	4	4	3	5	5	5
P3	3	3	3	3	3	3
P4	5	5	3	5	5	5
P5	2	3	3	5	5	5
P6	2	2	2	4	4	4
P7	2	3	3	4	4	4
P8	2	3	3	5	5	5