



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Advanced Biochemical Analyses							
Course Code		BYK605		Course Level		Third Cycle (Doctorate Degree)			
ECTS Credit	5	Workload	125 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		Advances in biological sciences largely depend on rapid developments in measurement and monitoring technologies. It is necessary to have knowledge about these new technologies, instrumental methods and basic principles of analytical / industrial processes, in order to reach quality reliable results in selection of suitable devices and methods in researches. The aim of this course is to give the students basic knowledge about advanced techniques in biochemistry and to gain the ability of advanced practical thinking in the analysis of biomolecules.							
Course Content		The role of analytical chemistry in biochemistry research, basic analytical principles, classification of quantitative analysis methods, the analysis error calculations, the separation and extraction methods, chromatographic techniques, electrophoretic techniques, the theoretical basis of spectroscopic techniques, UV-VIS spectroscopy, NMR-IR and their use in biochemistry, immunochemical techniques, mass spectroscopy and MALDI-MS technique, examples for applications.							
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	Biochemical Methods Sadasivam-a manickam
2	Metod of biochemical analysis. Clarence H. Suelter

Week	Weekly Detailed Course Contents	
1	Theoretical	Basic principles and applications of Hypnated techniques such as LC-MS / MS, CE-MS / MS
2	Theoretical	Basic principles and applications of advanced mass spectrometric techniques; For example, MALDI-TOF, ESI-TOF, SELDI-TOF etc.
3	Theoretical	Basic principles and applications of multidimensional techniques; i.e., 2D-PAGE, 2D-DIGE, 2D-LC
4	Theoretical	Basic principles and applications of stable isotope marking techniques; Ex: ICAT, SILAC, etc.
5	Theoretical	Basic principles and applications of immunostaining techniques; i.e., ELISA, RIA, etc.
6	Theoretical	Basic principles and applications of Spectral Techniques; For example; Fluorescence, NMR
7	Theoretical	Basic principles and applications of Spectral Techniques; For example; CD, FRET, etc.
8	Intermediate Exam	Advanced Biochemical Analyses Midterm Exam
9	Theoretical	Discussion and Seminar
10	Theoretical	Basic principles and applications of X-ray crystallography
11	Theoretical	Basic principles and applications of imaging techniques; For example; Cyro M, Immuno fluorescence etc.
12	Theoretical	Basic principles and applications of microarrays; DNA arrays
13	Theoretical	Basic principles and applications of microarrays; Protein arrays.
14	Theoretical	Basic principles and applications of microarrays; Glycoarrays.
15	Theoretical	Comparison and evaluation of techniques; guided problem solving
16	Final Exam	Advanced Biochemical Analysis 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	Ability to understand modern biochemical techniques and gain research experience
2	To be able to explain the basic principles of modern biochemical instrumental techniques, to understand the operating and application conditions
3	To be able to understand new developments in instrumentation technology
4	Ability to gain perspective in quantitative and qualitative evaluation and purification of biomolecules
5	To be able to understand new diagnostic tools in modern biochemistry laboratories

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	5	4	4	5	4
P3	5	5	5	5	5
P4	4	4	5	4	5
P5	5	5	4	5	5

