AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Molecular Laboratory Techniques II								
Course Code	TBY406		Couse Level	First Cycle (Bachelor's Degree)					
ECTS Credit	4	Workload	94 *(Hours)*	Theory	2	Practice	0	Laboratory	2
Objectives of the Course	The aim of this course is to enable the students to learn and apply techniques commonly used in molecular biology, to interpret the results of the experiments and to work in the lab independently or in a group.								
Course Content	Techniques in cell culture experiments, RNA and protein isolation and analysis, mutation detection methods, mitosis and cytokinesis analysis, cell differentiation and cellular respiration.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Experiment, Individual Study								
Name of Lecturer(s)	Lec. Ferhat KİREMİT								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	100
Final Examination	1	70

Recommended or Required Reading	
1	Carson S, Miller H, Witherow DS, Molecular Biology Techniques, Third Edition: A Classroom Laboratory Manual, Academic Press, Canada, 2011

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction to the cell culture laboratory and lab safety
	Practice	Introduction to the cell culture laboratory and lab safety
2	Theoretical	Cell line preperation: recovering cells from the stock, cell passaging with trypsin, cultivation and cell freeze for preservation
	Practice	Cell line preperation: recovering cells from the stock, cell passaging with trypsin, cultivation and cell freeze for preservation
3	Theoretical	Determining viability and proliferation ability of the cells, morphological cell analysis with light microscopy
	Practice	Determining viability and proliferation ability of the cells, morphological cell analysis with light microscopy
4	Theoretical	Analyzing mRNA expression of gene of interest: mRNA isolation, cDNA production by using RT-PCR, gel analysis of PCR products
	Practice	Analyzing mRNA expression of gene of interest: mRNA isolation, cDNA production by using RT-PCR, gel analysis of PCR products
5	Theoretical	Analyzing total protein level: total protein extraction from cultured cells, SDS –PAGE analysis
	Practice	Analyzing total protein level: total protein extraction from cultured cells, SDS –PAGE analysis
6	Theoretical	Analyzing a specific protein with Western blotting technique: protein transfer, visualization of a protein of interest
	Practice	Analyzing a specific protein with Western blotting technique: protein transfer, visualization of a protein of interest
7	Theoretical	An owerview
8	Theoretical	Mutation analysis methods -1: RFLP analysis
	Practice	Mutation analysis methods -1: RFLP analysis
9	Theoretical	Mutation analysis methods -2: SSCP analysis
	Practice	Mutation analysis methods -2: SSCP analysis
10	Theoretical	Slide preparation for mitosis and cytokinesis analysis: cell fixation and staining
	Practice	Slide preparation for mitosis and cytokinesis analysis: cell fixation and staining
11	Theoretical	Mitosis and cytokinesis
	Practice	Mitosis and cytokinesis
12	Theoretical	Cell differentiation

12	Practice	Cell differentiation
13	Theoretical	Cellular respiration
	Practice	Cellular respiration
14	Theoretical	Interpretation of the experimental results and paper discussion
15	Theoretical	Interpretation of the experimental results and paper discussion
16	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	2	56
Lecture - Practice	4	1	2	12
Laboratory	10	1	1	20
Midterm Examination	1	2	1	3
Final Examination	1	2	1	3
			Total Workload (Hours)	94
			[Total Workload (Hours) / 25*] = **ECTS**	4

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes

1	Comprehend the stages of cell division.
2	Have advanced level theoretical knowledge required for the mutation analysis in populations.
3	Define the gel based techniques for protein analysis.
4	Define an advanced level of cell culture techniques.
5	Have advanced level theoretical knowledge required for the quantitative analysis of gene expression in a heterologous cell system.

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
P1	4	4	4	4	4
P2	4	4	4	5	5
P3	3	4	4	5	5
P4	5	5	5	4	4
P5	3	3	4	4	4
P6	3	3	3	3	2
P7	2	2	2	2	2
P8	2	2	2	2	2