



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Agricultural Biotechnology Laboratory Techniques							
Course Code		TBY116		Couse Level		First Cycle (Bachelor's Degree)			
ECTS Credit	4	Workload	102 (<i>Hours</i>)	Theory	2	Practice	0	Laboratory	2
Objectives of the Course		<p>The main objectives of this course;</p> <ul style="list-style-type: none">• To have knowledge about science, scientific method and laboratory,• To have knowledge about methods used in biotechnology• To be able to interpret and discuss about the biotechnological methods,•To learn the main terms/concepts of biotechnology• To comprehend biotechnological methods at biological, chemical and molecular level.							
Course Content		Science and Scientific Method, Laboratory rules, safety and ethics, Metric units and their conversion used inBiotechnology Laboratory, Solutions, Biological molecules (Carbohydrates, Proteins, Lipids and Nucleic Acids), DNA, Gel Electrophoresis, Spectrophotometer, SDS-PAGE Electrophoresis, Western Blot, Polymerase Chain Reaction (PCR).							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment, Demonstration, Discussion, Individual Study, Problem Solving					
Name of Lecturer(s)		Lec. Zehra Burcu BAKIR							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	40
Assignment	1	20

Recommended or Required Reading

1	Tekeoğlu M (2013) Introduction to Biotechnology. Palme Press
2	Clark D (2005) Molecular Biology., Elsevier Inc.
3	Ausubel FM (2012) Current Protocols in Molecular Biology. John Wiley & Sons Inc.
4	Temizkan G, Arda N (2017) Basic and Advanced Molecular Biology Methods Genomic and Proteomic Analyzes. Nobel Tıp Kitapevleri

Week	Weekly Detailed Course Contents	
1	Theoretical	Laboratory rules and safety
	Laboratory	Case study for laboratory rules and safety
	Preparation Work	Preparation from recommended sources
2	Theoretical	Laboratory equipment and cleaning
	Laboratory	Introduction of Laboratory Materials and Cleaning
	Preparation Work	Preparation from recommended sources
3	Theoretical	Metric units and their conversion used in Biotechnology Laboratory
	Laboratory	Metric units and conversions problem solving
	Preparation Work	Preparation from recommended sources
4	Theoretical	General Analysis Techniques
	Laboratory	Preparing a solution
	Preparation Work	Preparation from recommended sources
5	Theoretical	Acids, Bases and Buffer solutions
	Laboratory	Preparing a buffer solution
	Preparation Work	Preparation from recommended sources
6	Theoretical	Biological molecules (Carbohydrates, Proteins, Lipids and Nucleic Acids)
	Laboratory	Determination of organic compounds
	Preparation Work	Preparation from recommended sources
7	Theoretical	Overview of Methods Used in Molecular Biology
	Laboratory	Homogenization methods and centrifugation



7	Preparation Work	Preparation from recommended sources
8	Theoretical	Overview of Methods Used in Molecular Biology
	Laboratory	Protein precipitation and dialysis
	Preparation Work	Preparation from recommended sources
9	Intermediate Exam	Overview
10	Theoretical	Parts of the microscope and preparation for use
	Laboratory	Examination of inner cheek epithelial cells
	Preparation Work	Preparation from recommended sources
11	Theoretical	Methods of enzyme analysis
	Laboratory	Enzymatic digestion of starch
	Preparation Work	Preparation from recommended sources
12	Theoretical	Isolation and analysis of nucleic acids
	Laboratory	DNA isolation
	Preparation Work	Preparation from recommended sources
13	Theoretical	Amplification of DNA by Polymerase Chain Reaction (PCR)
	Laboratory	Polymerase Chain Reaction (PCR) applications
	Preparation Work	Preparation from recommended sources
14	Theoretical	Agarose Gel Electrophoresis
	Laboratory	Agarose Gel Electrophoresis
	Preparation Work	Preparation from recommended sources
15	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	2	42
Assignment	1	6	0	6
Laboratory	14	2	1	42
Midterm Examination	1	5	1	6
Final Examination	1	5	1	6
Total Workload (Hours)				102
[Total Workload (Hours) / 25*] = ECTS				4

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	Having knowledge about science, scientific method and laboratory.
2	Having knowledge about technics used in agricultural biotechnology.
3	Gaining skills about the interpretation and discussion of the biotechnological methods
4	Learns the main terms/concepts of biotechnology
5	Comprehends the biotechnological methods at biological, chemical and molecular level.

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

