



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 Kitapçevleri

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 (Horticulture)

1	Ability to examine agricultural problems under the light of basic science, mathematics, and agriculture knowledge
2	Ability to plan and apply in different agricultural systems in horticultural crop plants
3	To constitute and realize breeding programmes according to market demands
4	Ability to propagate any kinds of stock materials in horticultural crop plants
5	Ability of transfer of modern technologies to production
6	Ability to have a consciousness of quality in production, storage, and evaluation in horticultural crop plants (To measure, evaluate, and manage different quality parameters)
7	To think analytically of protecting, providing transfer to future, and having responsibility to environment of all plant materials belong to horticultural crop plants area
8	Ability to search, think analytically, reach to knowledge, and obtain solution for solving of agricultural problems (Project, homework, thesis, summer training)
9	Ability to be aware of agricultural problems, to follow them, and to communicate own ideas of these subjects by verbal and written ways (Turkish, social course)
10	To be able to perform in a teamwork



11	Ability to work independently, give decision, and Express own thoughts by occupational-ethic values verbal and written ways in horticultural crop plants
12	Ability to think creatively, innovatively, and analytically, to comprehend the need of lifelong learning, be a part of a related subjects in a web of communication, and to develop by social means

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
P5	5	5	5	5	5

