



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Plant Molecular Biology and Genetics							
Course Code		ZBY514		Course Level		Second Cycle (Master's Degree)			
ECTS Credit	8	Workload	206 (<i>Hours</i>)	Theory	2	Practice	2	Laboratory	0
Objectives of the Course		The aim of class, at the definition of molecular biology, history, application areas and importance, structure of plant cell, function and evolutionary development, structure of nucleic acid and amino acids, structural properties of DNA and storage of genetic material, DNA replication and repair, structure of RNA regulation of organelle genome and chloroplast and mitochondrial gene expression, transcription, RNA modification, protein synthesis, directing and degradation, promoter activity, cis-acting elements and transcription factors, transposable elements and broad silencing, organization and structure of plant genome , the signaling mechanism at the plant cell and the cell cycle.							
Course Content		Functions of biomolecules in plants, DNA-RNA structure, replication and protein synthesis, nucleus and organelle genomes, signaling mechanisms in plants.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment, Demonstration, Case Study, Individual Study					
Name of Lecturer(s)		Assoc. Prof. Emre SEVİNDİK							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading

1	Plant Biotechnology and Genetics (Nobel Academic Publishing) 2012
2	Genetic (Nobel Academic Publishing) 2010

Week	Weekly Detailed Course Contents	
1	Theoretical	Molecular biology, history, application areas and importance
	Practice	Laboratory introduction
2	Theoretical	Structure of plant cell, function and development,
	Practice	Laboratory safety
3	Theoretical	Structure of biomolecules in plants
	Practice	Use of laboratory chemicals
4	Theoretical	Genetic and structural properties of DNA
	Practice	Isolation of genomic DNA with different protocols
5	Theoretical	Structure and properties of RNA
	Practice	RNA isolation
6	Theoretical	RNA modification, protein synthesis and degradation
	Practice	Electrophoresis method
7	Theoretical	Transcription factors, transposable elements and broad silencing
	Practice	Gel imaging of DNA and RNA products
8	Intermediate Exam	Midterm
9	Theoretical	Organization and structure of plant genome
	Practice	PCR types and application
10	Theoretical	Regulation of organelle genome and chloroplast and mitochondrial gene expression
	Practice	Teaching of markers (ISSR, RAPD, AFLP, SSR, VNTR) and application by PCR and gel imaging by electrophoresis
11	Theoretical	Disease tolerance and related genes in plants
	Practice	PCR amplification of nucleotide, chloroplast and mitochondrial gene regions
12	Theoretical	Molecular systematic techniques used in plant research
	Practice	DNA sequencing and sequence analysis
13	Theoretical	Signal system and cell cycle in plant cell



13	Practice	Bioinformatics analyzes
14	Theoretical	Genetically modified organisms and transgenic plants
	Practice	Phylogenetic analyzes
15	Theoretical	Overview
	Practice	Phylogenetic analyzes II
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	7	2	126
Lecture - Practice	14	3	2	70
Midterm Examination	1	4	1	5
Final Examination	1	4	1	5
Total Workload (Hours)				206
[Total Workload (Hours) / 25*] = ECTS				8

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	The function of biomolecules is learned
2	Learn DNA-RNA structure
3	Learn plant genome structure
4	Learn nucleus and organelle gene expression
5	Transcriptom and Microarrays are learned

Programme Outcomes (Agricultural Biotechnology Master)

1	Students learn various techniques and evaluates resources about agricultural biotechnology
2	Make the necessary projects in agricultural biotechnology and to conduct a study of the basic level independently
3	Students learns how to conduct a scientific research and prepares themselves for the scientists in the direction of their ideals.
4	Students may reveal new ideas in social and scientific issues and can benefit from the ideas and produce something new winning independent and teamwork skills.
5	Students can use its products for the benefit of humanity, they can produce technology and collaborate with industry

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	4
P3	5	5	5	5	4
P4	4	5	4	4	5
P5	3	4	2	2	4

