AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Molecular Markers and Analysis Methods								
Course Code	TBY410		Couse Level	First Cycle (Bachelor's Degree)					
ECTS Credit	4	Workload	100 *(Hours)*	Theory	2	Practice	0	Laboratory	2
Objectives of the Course	The aim of the course is to make the students learn molecular markers which are used in molecular biology. The goal is to teach DNA molecular markers which are widely used in phylogenetic analysis, gene mapping, breeding etc.								
Course Content	Molecular markers and their use at agriculture , molecular diagnosis of plant diseases and pests, the use of gene transfer technology and agriculture.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Experiment, Discussion, Individual Study								
Name of Lecturer(s)	Assoc. Prof. Emre SEVİNDİK								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Final Examination	1	110

Recommended or Required Reading	
1	Nathan, S. Moiser, Michael R. Ladisch. 2009. Modern Biotechnology
2	Bitki Biyoteknolojisi (Genetik Mühendisliği ve Uygulamaları) Sebahattin Özcan, Ekrem Gürel, Mehmet Babaoğlu. Selçuk Üniversitesi Vakfı Yayınları.

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction, PCR and types
	Preparation Work	Having knowledge from source books
2	Theoretical	Morphological, Biochemical and Molecular Markers
	Preparation Work	Having knowledge from source books
3	Theoretical	RFLP and RAPD technique
	Preparation Work	Having knowledge from source books
4	Theoretical	ISSR and AFLP technique
	Preparation Work	Having knowledge from source books
5	Theoretical	Polymerase Chain Reactions (PCR) and Real Time PCR
	Preparation Work	SSR, SNP, iPBS, SCAR marker technique
6	Theoretical	Gel Electrophoresis techniques (agarose and PAGE)
	Preparation Work	Having knowledge from source books
7	Preparation Work	Protein analysis methods
8	Theoretical	Nuclear DNA gene regions
9	Preparation Work	Introns and exons
10	Preparation Work	Chloroplast DNA gene regions
11	Theoretical	rbcL, matK, ndhF, trnQ-rps16 gene regions
	Preparation Work	Having knowledge from source books
12	Preparation Work	Mitochondria gene regions
13	Preparation Work	Bacterial gene regions
14	Theoretical	Bioinformatics programs used in phylogenetics
	Preparation Work	Phylogenetic analysis methods
15	Theoretical	RNA analysis
	Preparation Work	Using NCBI, Blast, MEGA 6, PAUP, Bioedit
16	Final Exam	Final exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	1	42

Laboratory	14	1	2	42
Final Examination	1	15	1	16
			Total Workload (Hours)	100
			[Total Workload (Hours) / 25*] = **ECTS**	4
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To explain polymorphism and importance of it
2	Moleküler markörlerin avantaj ve dezavantajlarını öğrenme
3	To learn advantage and disadvantages of molecular markers
4	To know how to choose appropriate method and marker
5	To understand Restriction Digestion, PCR
6	To practice gel electrophoresis techniques (agarose and PAGE)
7	To identify molecular markers and usage of them

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	L6	L7
P1	3	5	5	4	3	5	4
P2	3	3	3	4	3	3	4
P3	5	3	3	5	4	5	5
P4	5	5	5	5	5	5	5
P5	5	4	4	4	5	4	4
P6	4	4	4	4	3	4	4
P7	4	4	4	4	3	4	4
P8	5	5	5	5	5	5	5