AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Molecular Systematic								
Course Code	ZBY509		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	7	Workload	178 *(Hours)*	Theory	2	Practice	2	Laboratory	0
Objectives of the Course	The aim of class is to determine the phylogenetic relationships between plants, animals, fungi and bacteria. Between species, nuclear, chloroplasts, mitochondria, 16S, gene regions and markers using computer programs such as PAUP, MEGA 6.0, CLUSTAL W, PHYLIP, and phylogenetic trees and genetic distances and species relationship were planned..								
Course Content	Taxonomy, morphological markers, protein markers, nuclear, chloroplast, mitochondria, 16S, introduction of regions, DNA sequencing and sequence analysis techniques, PAUP, MEGA 6.0, CLUSTAL, Phylogeny fr. introduction of phylogenetic tree programs such as ISSR, RAPD, AFLP, SSR, VNTR in the phylogenetic use of markers.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Discussion, Case 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	Evolution, Palme Publishing
2	Nei M, Kumar S (2000) Molecular evolution and phylogenetics. Oxford University press
3	Lemey, P., Salemi, M., Vandamme, A.M. (2009). The Phylogenetic Handbook. Cambridge University press ISBN:9780521877107

Week	Weekly Detailed Course Contents	
1	Theoretical	Basis and purpose of classification
	Practice	Laboratory tools used in molecular systems
2	Theoretical	Teaching systematic science
	Practice	Laboratory tools used in molecular systems
3	Theoretical	To applicate molecular techniques to working branches
	Practice	Morphological characterization and cladistic analysis
4	Theoretical	Morphological and protein markers learning
	Practice	Protein markers and SDS page application
5	Theoretical	Learning SSR, VNTR, ISSR, RAPD, AFLP etc. markers
	Practice	Restriction fragment length polymorphism (RFLP) and random amplified polymorphic DNA application
6	Theoretical	Teaching of nuclear, chloroplast and mitochondrial gene regions
	Practice	ISSR and AFLP application
7	Theoretical	Phylogenetic classifications, ability of use phenetic classifications techniques
	Practice	SSR and VNTR application
8	Intermediate Exam	Midterm Exam
9	Theoretical	In phylogenetic classification used in online programs used
	Practice	nrDNA ITS sequence and analysis
10	Theoretical	PAUP, MEGA 6.0, PHYLIP, etc. use of phylogenetic programs
	Practice	cpDNA trnL-F, ndhF, matK rbcL, psbA-trnH analysis
11	Theoretical	Phylogenetic tree building using computer program
	Practice	mtDNA sequence
12	Theoretical	Interpretation of phylogenetic tree
	Practice	DNA sequence analysis
13	Theoretical	Molecular clock hypothesis, Relative velocity test, Linear trees

13	Practice	Bioinformatics programs
14	Theoretical	Relationship between systematic concepts and molecular techniques
	Practice	Phylogenetic tree and analysis
15	Theoretical	An article analysis is made about the molecular systematic.
	Practice	Genetic distance analysis
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	5	2	98
Lecture - Practice	14	3	2	70
Midterm Examination	1	4	1	5
Final Examination	1	4	1	5
			Total Workload (Hours)	178
			[Total Workload (Hours) / 25*] = **ECTS**	7

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes

1	Learning morphological and protein markers
2	Learning of encoding and non-coding gene regions used in phylogenetics
3	Learning of various bioinformatics computer programs used in phylogenetics.
4	Learning of the use of molecular marker techniques in phylogenetic studies
5	PAUP analysis and interpretation 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 themself 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	5	4	4	5	4
P5	3	3	3	3	3