



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Molecular Laboratory Techniques I							
Course Code		TBY405		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	4	Workload	97 (Hours)	Theory	2	Practice	0	Laboratory	2
Objectives of the Course		The aim of this course is to introduce a detailed description of the molecular methods used in biotechnology.							
Course Content		The contents of this course include introduction to molecular genetic lab, solution preparation methods, DNA isolation in plants, determination of DNA quantity and quality, PCR, preparation of agarose and polyacrilamide gel, the use of biochemical markers in breeding, hybridization-based molecular techniques and practices used in horticulture breeding, determination of gen expression (cDNA-AFLP, microarray), quantitative determination of gene expression (Real Time PCR), similarity index, the creation and evaluation of the dendograms.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment, Individual Study					
Name of Lecturer(s)		Lec. Ferhat KİREMİT							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	70

Recommended or Required Reading

1	Molecular Markers in Plants Robert J. Henry
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Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction to molecular genetic lab, solutions preparation methods
	Practice	Introduction to molecular genetic lab, solutions preparation methods
	Preparation Work	Reading course-related information from different sources
2	Theoretical	
	Practice	
	Preparation Work	Reading course-related information from different sources
3	Theoretical	Determination of DNA quantity and quality
	Practice	Determination of DNA quantity and quality
	Preparation Work	Reading course-related information from different sources
4	Theoretical	Polymerase chain reaction (PCR)
	Practice	Polymerase chain reaction (PCR)
	Preparation Work	Reading course-related information from different sources
5	Theoretical	Preparation of agarose and polyacrilamide gel
	Practice	Preparation of agarose and polyacrilamide gel
	Preparation Work	Reading course-related information from different sources
6	Theoretical	The use of biochemical markers in breeding
	Practice	The use of biochemical markers in breeding
	Preparation Work	Reading course-related information from different sources
7	Intermediate Exam	Midterm
8	Theoretical	Hybridization-based molecular techniques and practices used in Horticulture breeding (RFLP)
	Practice	Hybridization-based molecular techniques and practices used in Horticulture breeding (RFLP)
	Preparation Work	Reading course-related information from different sources
9	Theoretical	PCR-based molecular breeding techniques and practices used in biotechnology (RAPD, ISSR)
	Practice	PCR-based molecular breeding techniques and practices used in biotechnology (RAPD, ISSR)
	Preparation Work	Reading course-related information from different sources
10	Theoretical	PCR-based molecular breeding techniques and practices used in biotechnology (SSR, SRAP)
	Practice	PCR-based molecular breeding techniques and practices used in biotechnology (SSR, SRAP)



10	Preparation Work	Reading course-related information from different sources
11	Theoretical	PCR-based molecular breeding techniques and practices used in biotechnology (AFLP, CAPs)
	Practice	PCR-based molecular breeding techniques and practices used in biotechnology (AFLP, CAPs)
	Preparation Work	Reading course-related information from different sources
12	Theoretical	Determination of gen expression (cDNA-AFLP, microarray)
	Practice	Determination of gen expression (cDNA-AFLP, microarray)
	Preparation Work	Reading course-related information from different sources
13	Theoretical	Quantitative determination of gene expression (Real Time PCR)
	Practice	Quantitative determination of gene expression (Real Time PCR)
	Preparation Work	Reading course-related information from different sources
14	Theoretical	Similarity index, the creation and evaluation of the dendograms
	Practice	Similarity index, the creation and evaluation of the dendograms
	Preparation Work	Reading course-related information from different sources
15	Theoretical	General review
16	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	2	2	56
Lecture - Practice	3	1	2	9
Laboratory	12	1	1	24
Midterm Examination	1	3	1	4
Final Examination	1	3	1	4
Total Workload (Hours)				97
[Total Workload (Hours) / 25*] = ECTS				4

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	Have knowledge about molecular biology laboratory and equipment
2	Have knowledge about methods and techniques used in molecular biology
3	Marker types and analysis are learned
4	Nucleus, chloroplast and mitochondria gene regions are learned
5	Learning bioinformatics programs used in marker technique

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	4	4	4	5	5
P2	4	4	4	5	5
P3	5	5	4	5	4
P4	5	5	4	5	5
P5	4	4	3	3	3
P6	3	3	3	2	3



P7	2	2	2	2	3
P8	2	2	2	2	2

