AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Genetic Analysis Technique Based on PCR						
Course Code	TBY423		Couse Level	First Cycle (Bachelor's Degree)			
ECTS Credit	3	Workload	70 (Hours)	Theory	2	Practice	0	Laboratory	0
Objectives of the Course	The aim of this course is to provide information about the usage of polymerase chain reaction (PCR) in genetic assays, to explain different PCR types and to provide theoretical and practical information about PCR based genetic analysis systems to the students.						
Course Content	In this course, the history of PCR and how this technique has been developed, PCR chemicals and the preperation of a PCR reactions, amplify a gene region in laboratory, details of different PCR types, explain how PCR technique is used in molecular genetic studies, provide information about the PCR based genetic analysis systems, application of PCRRFLP analysis, PCR errors and their solutions will be discussed.						
Work Placement	N/A						
Planned Learning Activities and Teaching Methods			Explanation (Presentation), Experiment, Demonstration, Discussion				
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	The Polymerase Chain Reaction by Kary B. Mullis (Editor), Francois Ferre (Editor), Richard A. Gibbs (Editor), J.D. Watson (Foreword)

Week	Weekly Detailed Course Contents	
1	Theoretical	History of PCR and the development of the PCR techniques.
2	Theoretical	Different type of DNA molecules, genome structures and and DNA isolation from different tissues
3	Theoretical	The chemicals used in PCR reactions and the preperation of a PCR reaction
4	Theoretical	Amplification a gene region
5	Theoretical	Different PCR types (Gradient PCR, nested PCR, multiplex PCR)
6	Theoretical	Different PCR types (Hot start PCR, touchdown PCR, reverse transcriptase PCR)
7	Intermediate Exam	Mid Term Exam
8	Theoretical	Different PCR types (Allele specific PCR, asymmetric PCR, in situ PCR)
9	Theoretical	To explain the Quantitative PCR (QPCR) or Real Time PCR (RT PCR) for measuring the quantity of PCR product
10	Theoretical	PCR errors and solutions of the errors
11	Theoretical	PCR applications in genetic studies (Molecular identification, Sequence Analyses, Genetic Engineering)
12	Theoretical	PCR based genetic analysis systems (RAPD, RFLP, AFLP,SSR, etc.)
13	Laboratory	Application of ISSR analysis in lab
14	Laboratory	Application of ISSR analysis in lab 2
15	Theoretical	Discussion on the recent scientific papers about PCR technique.
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	12	2	2	48
Lecture - Practice	2	3	2	10
Midterm Examination	1	5	1	6

Final Examination	1	5	1	6
		Total Workload (Hours)		70
		[Total Workload (Hours) / 25*] = **ECTS**		3

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	Students learn the details of the PCR technique
2	Students learn how the PCR technique is used in molecular genetic studies.
3	Students learn different types of PCR.
4	Students learn PCR based genetic analysis techniques.
5	Students learn the PCR based errors and their corrections.
6	Students learn ISSR analysis.

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
P1	5	5	5	5	5	5
P2	4	4	4	4	4	4
P3	4	4	4	4	4	4
P4	4	4	4	4	4	4
P5	4	4	4	4	4	4
P6	4	4	4	4	4	4
P7	2	2	2	2	2	2
P8	2	2	2	2	2	2