AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Biotechnological Application in Laboratory Techniques								
Course Code	LBT122		Couse Level	Short Cycle (Associate's Degree)					
ECTS Credit	3	Workload	75 *(Hours)*	Theory	2	Practice	2	Laboratory	0
Objectives of the Course	It is the objective of this course to enable the under graduate students to learn historical development of markers used in past to present time and to learn common types of molecular markers and analysis methods								
Course Content	Definition and types of markers. Definition, types and applications of molecular markers. Isolation of nucleic acids (DNA and RNA isolation). RAPD, AFLP, RFLP, Microsatellites (SSR), SNP, EST, Microarray and its analysis methods								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration								
Name of Lecturer(s)	Lec. Mürüvvet ABBAK								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	70

Recommended or Required Reading	
1	Temizkan, G., 2013. Moleküler Genetik. Nobel Tip Kitabevi ISBN: 9786053350217
2	Lörz, H., Wenzel, G., 2008. Molecular Marker Systems in Plant Breeding and Crop Improvement (Biotechnology in Agriculture and Forestry) Springer
3	Cox, M.M., Doudna, J., O'Donnell, M., 2012. Molecular biology principle and practice
4	Konuk, M., Moleküler Biyoloji Önemli Notlar. Nobel Yayınları ISBN: 9789755915968.
5	Guimarães EP, Ruane J, Scherf BD, Sonnino A, Dargie JD 2007 Marker-Assisted Selection. Current Status and Future Perspectives in Crops, Livestock, Forestry and Fish.
6	FAO (2011).Molecular genetic characterization of animal genetic resources. FAO Animal Production and Health Guidelines. No: 9, Rome
7	Hawley, R.S. And Walker, M.Y. (2003). Advanced Genetic Analysis. Finding Meaning in a Genome. Blackwell Publishing. Victoria/Australia

Week	Weekly Detailed Course Contents	
1	Theoretical	General information about biotechnology. History and development of biotechnology.
	Practice	General information about biotechnology. History and development of biotechnology.
2	Theoretical	Biosystems Microorganisms, Plants and Animals
	Practice	Biosystems Microorganisms, Plants and Animals
3	Theoretical	Definition and types of Markers (Token)
	Practice	Definition and types of Markers (Token)
4	Theoretical	Definition, types and uses of molecular markers
	Practice	Definition, types and uses of molecular markers
5	Theoretical	Biotechnology and Application Areas Definition of Biotechnology Applications of Biotechnology in Food, Medicine, Enzyme, Plant, Environment and Genetics
	Practice	Biotechnology and Application Areas Definition of Biotechnology Applications of Biotechnology in Food, Medicine, Enzyme, Plant, Environment and Genetics
6	Theoretical	Chromosome, Gene, Genome etc. basic concepts Nucleic acid Isolation (DNA and RNA isolation)
	Practice	Chromosome, Gene, Genome etc. basic concepts Nucleic acid Isolation (DNA and RNA isolation)
7	Theoretical	Selection criteria of molecular markers
	Practice	Selection criteria of molecular markers
8	Intermediate Exam	Mid-Term Exam
9	Theoretical	RAPD (Randomly amplified polymorphic DNA)
	Practice	RAPD (Randomly amplified polymorphic DNA)
10	Theoretical	AFLP (Amplified fragment length polymorphism),RFLP (Restriction fragment length polymorphism)

10	Practice	AFLP (Amplified fragment length polymorphism),RFLP (Restriction fragment length polymorphism)
11	Theoretical	Microsatellites, Sequencing and EST methods
	Practice	Microsatellites, Sequencing and EST methods
12	Theoretical	SNP (Single point mutations)
	Practice	SNP (Single point mutations)
13	Theoretical	Marker assisted selection
	Practice	Marker assisted selection
14	Theoretical	Uses of markers in plant and animal breeding
	Practice	Uses of markers in plant and animal breeding
15	Theoretical	Evaluation of data from molecular markers
	Practice	Evaluation of data from molecular markers
16	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	2	28
Lecture - Practice	14	0	2	28
Midterm Examination	1	8	1	9
Final Examination	1	9	1	10
			Total Workload (Hours)	75
			[Total Workload (Hours) / 25*] = **ECTS**	3

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes

1	To know about molecular marker types
2	To understand importance of molecular markers in breeding studies
3	Be able to obtain knowledge about applications of molecular markers
4	To understand analyze technique of molecular markers
5	To understand Isolation of nucleic acids (DNA and RNA isolation)

Programme Outcomes *(Laboratory Technology)*

1	To be able to comprehend social, cultural and social responsibilities, to be able to follow national and international contemporary problems and developments
2	Atatürk is bound to Atatürk nationalism in the direction of principles and reforms; Adopting the national, moral, spiritual and cultural values of the Turkish people, open to universal and contemporary developments, the Turkish language is a rich, rooted and productive language; Have a love of language and a consciousness; To have the ability to use as much of a foreign language as he would need to read, taste and habit and professionally.
3	To be able to recognize the basic hardware units and operating systems of a computer, having information about internet usage and preparing documents, spreadsheets and presentations on computer by using office programs.
4	Acquires theoretical and practical knowledge at the basic level in mathematics, science and vocational field.
5	With the knowledge of laboratory technology in the field, he knows and analyzes problems, brings interpretation of data and suggests solutions.
6	In laboratories, according to the prepared business plan and program, necessary work can be done to obtain the desired quality products.
7	To have professional and ethical responsibility in business life.
8	Development and change are open, follow scientific social and cultural innovations, and develop themselves constantly.

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	3	3	3	3	3
P4	3	3	3	3	3
P5	5	5	5	5	5
P6	5	5	5	5	5
P7	5	5	5	5	5
P8	4	4	4	4	4