AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Genetic Markers								
Course Code	MBTK641		Couse Level	Third Cycle (Doctorate Degree)					
ECTS Credit	10	Workload	247 *(Hours)*	Theory	2	Practice	2	Laboratory	0
Objectives of the Course	To introduce the students basic models of population genetics, to inform about computer programs used for population genetics, to provide interpret results and to analyze by integrating computer programs with population genetics models by using data set of students.								
Course Content	Hardy Weinberg principle and applications, Fixation index and heterozygosity, Genetic migration and efficient population size, Mutations, Natural selection and models, Quantitative trait variation and evolution, Mendelian basis of quantitative trait variation, Application of population genetics: use of Bioedit, Microchecker, DNAsp, Arlequin, Migrate, Genepop, Popgene, Structure programs								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Discussion, Problem Solving								
Name of Lecturer(s)	Assoc. Prof. Seda ÖRENAY BOYACIOĞLU								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

Recommended or Required Reading	
1	Richard Frankham, Jonathan D. Ballou, David A. Briscoe. Introduction to Conservation Genetics, Cambridge University Press, 7th edition, 2007
2	Jon C. Herron, Scott Freeman. Evrimsel analiz, Palme Yayıncılık, 2009

Week	Weekly Detailed Course Contents	
1	Theoretical	Bioinformatics and usage areas: Who can use it? How it can be use? What purpose can it be used?
2	Theoretical	Examination of biological databases
3	Practice	Basic methods 1: polymerase chain reaction, RAPD
4	Practice	Basic methods II: Allozym RFLP and AFLP
5	Practice	Basic methods III: Microsatellites, mtDNA, SNP and DNA sequence analysis
6	Theoretical	DNA/protein database and usage strategies
7	Practice	DNA/protein database and usage strategies
8	Intermediate Exam	Midterm exam
9	Theoretical	Multiple sequence analysis - comparison
10	Theoretical	Moleculer Phylogeny
11	Practice	Phylogenetic tree construction
12	Practice	Population genetics
13	Practice	Bioinformatic methods for RNA
14	Practice	Microarray data analysis
15	Final Exam	Final exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	13	0	2	26
Lecture - Practice	13	0	2	26
Assignment	6	0	13	78
Term Project	3	0	6	18
Laboratory	5	0	2	10
Individual Work	13	0	5	65
Quiz	6	0	3	18
Midterm Examination	1	0	3	3

Final Examination	1	0	3	3
			Total Workload (Hours)	247
			[Total Workload (Hours) / 25*] = **ECTS**	10
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To learn genetic factors like mutation, migration and selection that contributes to genetic differentiations within a population and among populations
2	To learn heterozygosity and Hardy-Weinberg unequilibrium
3	To learn population structure
4	To learn to gene fixation and gen flow among populations
5	To learn to use population genetic programs
6	To interpret about the population by detecting/calculating effect to population of environmental and external influences with interacting organisms, population demography on the sample data by using computer programs
7	To plan future studies on any organisms

Programme Outcomes *(Molecular Biotechnology(English) Interdisciplinary Doctorate)*	
1	Ability to identify, analyze and understand problems related to molecular biotechnology and finding valid conclusions with basic knowledge in biotechnology
2	Ability to appropriately use laboratories and their associated equipment as part of research and observation activities through various branches of sciences
3	Ability to understand and interpret biological processes at cell, tissue, organ, system and organism levels
4	Ability to decide and apply appropriate tools and techniques in biotechnological manipulation
5	Ability to comprehend fundamentals of genetics and molecular biology and carry out basic methods in relevant applications
6	Ability to apply the fundamentals of protein and DNA chemistry, and immunology to techniques in biotechnology
7	. Ability to understand and practice basics of applied biotechnology, with acquired knowledge on problem solving approaches
8	Ability to understand and interpret basics of molecular applications within medical, agriculture, veterinary and forensic sciences
9	Ability to perceive biological existence at the global and regional scales, together with comprehension of associated problems
10	Acquiring appropriate knowledge in the field of basic sciences to support perception, analysis and interpretation of biological facts, and ability to use and practice relevant methods for this goal
11	Ability to develop proficiency in laboratory management, including maintenance of an orderly work environment, inventory and ordering, and set up or maintenance of equipment
12	Ability to learn essential methods in microbiology and basic skills in a microbiology labortaory
13	Ability to demonstrate proficiency with standard techniques in liquid measurement, recombinant DNA technology, protein purification and identification, and cell culture

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	5	5	5	5	5	5	5
P2	5	5	5	5	5	5	5
P3	3	3	3	3	3	3	3
P4	5	5	4	4	4	4	4
P5	5	5	4	4	4	4	4
P6	3	3	3	3	3	3	3
P7	4	4	5	5	5	5	5
P8	4	4	5	5	5	5	5
P9	4	4	5	5	5	5	5
P10	4	4	5	5	5	5	5
P11	3	3	3	3	3	3	3
P12	3	3	3	3	3	3	3
P13	5	5	5	5	5	5	5