



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Advanced Microbial Genetics							
Course Code		MBTK600		Course Level		Third Cycle (Doctorate Degree)			
ECTS Credit	8	Workload	199 ( <i>Hours</i> )	Theory	2	Practice	2	Laboratory	0
Objectives of the Course		The aim of this course is give information about genetics of bacteria, fungi and viruses.							
Course Content		DNA, RNA and protein structures, genes, ORF's, promoters, terminators, operons, transformation, transduction and conjugation. Mutations in microorganism, phenotype determination, 18S rRNA analysis for fungi classification							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment, Demonstration, Discussion, Individual Study					
Name of Lecturer(s)									

### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	60

### Recommended or Required Reading

1	Microbial genetics of bacteria, ISBN 155581204X
2	Brock, Biology of Microorganisms

Week	Weekly Detailed Course Contents	
1	Theoretical	Genetic materials in prokaryotes and eukaryotes, replication, protein synthesis, DNA staining
2	Practice	Conjugation in E.coli
3	Practice	Gen transfer via transformation
4	Theoretical	Viral vectors
5	Theoretical	Spontan mutation detection in bacteria
6	Practice	Determination of growth factor requirement in auxotrophic mutants
7	Practice	UV treatment on E.coli cells
8	Intermediate Exam	Midterm exam
9	Practice	16S rRNA analysis in Bacteria
10	Theoretical	18S rRNA analysis in yeasts and molds
11	Practice	18S rRNA analysis in yeasts and molds
12	Theoretical	Mitochondrial DNA analysis
13	Theoretical	Protoplast fusion in Bacteria
14	Practice	Protoplast fusion in Bacteria
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	4	0	15	60
Term Project	3	0	6	18
Individual Work	13	0	3	39
Quiz	6	0	4	24
Midterm Examination	1	0	3	3



Final Examination	1	0	3	3
Total Workload (Hours)				199
[Total Workload (Hours) / 25*] = ECTS				8
*25 hour workload is accepted as 1 ECTS				

### Learning Outcomes

1	Be able to understand DNA, RNA and protein concept
2	Be able to understand replication and protein synthesis
3	Be able to get knowledge about mutations in bacteria and yeasts
4	Be able to apply identification methods based on 18S rRNA
5	Be able to work with mitochondrial DNA
6	Be able to recognize horizontal gen transfer in bacteria

### 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
P1	5	5	5	5	5	5
P2	5	5	5	5	5	5
P3	3	3	3	3	3	3
P4	5	5	4	4	4	4
P5	5	5	4	4	4	4
P6	3	3	3	3	3	3
P7	4	4	5	5	5	5
P8	4	4	5	5	5	5
P9	4	4	5	5	5	5
P10	4	4	5	5	5	5
P11	3	3	3	3	3	3
P12	3	3	3	3	3	3
P13	5	5	5	5	5	5

