



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Prokaryotic Gene Expression							
Course Code		ZBY513		Coure Level		Second Cycle (Master's Degree)			
ECTS Credit	7	Workload	178 ( <i>Hours</i> )	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The objective of this course is to provide an overview of prokaryotic gene structure, function and regulation of the gene expression							
Course Content		In this course, it is told about detail information on prokaryotic gene structure and function, knowledge about the mechanisms of DNA synthesis, transcription and translation in prokaryotes, and how the gene expression is regulated in prokaryotes.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Case Study, Individual Study					
Name of Lecturer(s)									

### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	60
Assignment	1	10

### Recommended or Required Reading

1	Watson, J.D., et al. Molecular Biology of the Gene. 4. ed. The Benjamin/Cummings Pub. Co., Menlo Park, California, 1988
2	Alberts, B., et al. Molecular Biology of the Cell. 3. ed. Garland Pub., New York, 1994
3	Lewin, B. Genes VII. Oxford University Pres, Oxford, 2000
4	Biology of the Prokaryotes, Lengeler, J., Schlegel, H. (Eds), 1999, Blackwell Publishing, Stuttgart, Germany
5	The World of the Cell, Becker, W.M., Kleinsmith, L.J., and Hardin, J.,2000, Addison Wesley Publishing Company, Massachusetts,U.S.A.
6	Wagner, R. Transcription Regulation in Prokaryotes. Oxford University Press, 2000.

Week	Weekly Detailed Course Contents	
1	Theoretical	General view of the prokaryotic cell, cell growth and cell cycle
2	Theoretical	*DNA Structure and Genetic Information *Supercoiling and histone like proteins *Chromosomes and Other Genetic Elements *Analytic methods in DNA and RNA research
3	Theoretical	*Mechanisms of DNA replication in prokaryotes *Short overview of eukaryotic DNA replication
4	Theoretical	*Mechanisms of Transcription in prokaryotes *Short overview of eukaryotic Transcription
5	Theoretical	Mechanisms of translation in prokaryotes
6	Theoretical	*Short overview of eukaryotic translation *Genetic code *Protein Folding and Secretion *Molecular chaperones *Expressing Genes in Bacteria
7	Theoretical	*REGULATION *DNA-Binding Proteins and Transcriptional Regulation *Negative control' versus 'positive control'
8	Intermediate Exam	Midterm exam
9	Theoretical	*Catabolite Repression *Sensing and Signal Transduction *Quorum Sensing *Heat Shock Proteins *Stringent Response



10	Theoretical	*Alternative sigma factors *RNA-Based Regulation *Attenuation
11	Theoretical	Regulation of translation and post-translational modifications
12	Theoretical	*Methods for Manipulating DNA *Essentials of Molecular Cloning *Molecular Methods for Mutagenesis
13	Theoretical	*Gene Fusions and Reporter Genes *Cloning Vectors, Shuttle Vectors
14	Theoretical	Hosts for Cloning Vectors
15	Theoretical	Expression Vectors and Regulation of Transcription
16	Final Exam	Final exam

### Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	8	3	154
Assignment	1	6	1	7
Midterm Examination	1	7	1	8
Final Examination	1	8	1	9
Total Workload (Hours)				178
[Total Workload (Hours) / 25*] = ECTS				7

\*25 hour workload is accepted as 1 ECTS

### Learning Outcomes

1	Assess prokaryotic gene structure and function.
2	Gain knowledge about the mechanisms of DNA synthesis, transcription and translation in prokaryotes.
3	Tell how the gene expression is regulated in prokaryotes.
4	Genetic Transfer Methods in Bacteria
5	The use of basic plasmids in cloning

### Programme Outcomes (Agricultural Biotechnology Master)

1	Students learn various techniques and evaluates resources about agricultural biotechnology
2	Make the necessary projects in agricultural biotechnology and to conduct a study of the basic level independently
3	Students learns how to conduct a scientific research and prepares themselves for the scientists in the direction of their ideals.
4	Students may reveal new ideas in social and scientific issues and can benefit from the ideas and produce something new winning independent and teamwork skills.
5	Students can use its products for the benefit of humanity, they can produce technology and collaborate with industry

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

