AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title		Applied Molecular Biology II							
Course Code		TBY304		Couse Level		First Cycle (Bachelor's Degree)			
ECTS Credit	4	Workload	100 *(Hours)*	Theory	2	Practice	0	Laboratory	2
Objectives of the Course		The goal of the course is to teach gene expression mechanisms of eukaryotes and prokaryotes.							
Course Content		Gene expression in prokaryotes and eukaryotes; transcription, regulatory elements and transcription factors, mRNA processing, genetic code, translation and functional protein synthesis by post-translational modifications							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment, Discussion, Individual Study					
Name of Lecturer(s)		Assoc. Prof. Emre SEVİNDİK							

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Final Examination	1	110

Recommended or Required Reading	
1	Moleküler Biyoloji (Protein Sentezi ve Yıkımı). Ed: Ahmet Yıldırım, Fevzi Bardakçı, Mehmet Karataş, Bahattin Tanyolaç. NOBEL Kitabevi
2	Moleküler Biyoloji. Nihat Dilsiz. Palme Yayıncılık.
3	Genes VIII, Benjamin Lewin, New Jersey: Prentice- Hall, 2004
4	Molecular Biology of the Gene, James D. Watson, Tania A. Baker, Stephen P. Bell , Alexander Gann , Michael Levine , Richard Losick, Benjamin Cummings Pub Co., San Francisco, 2003.

Week	Weekly Detailed Course Contents	
1	Theoretical	Gene expression in prokaryotes
	Laboratory	Introduction to Molecular laboratory
	Preparation Work	Preparing presentation from textbooks of and internet
2	Theoretical	Gene expression in eukaryotes
	Laboratory	Molecular markers
	Preparation Work	Preparing presentation from textbooks of and internet
3	Theoretical	Transcription in prokaryotes, its activation and repression and transcription factors
	Laboratory	DNA extractions and cloning by PCR
	Preparation Work	Preparing presentation from textbooks of and internet
4	Theoretical	Transcription in prokaryotes, its activation and repression and transcription factors
	Laboratory	Running the PCR product on the gel and the process after
	Preparation Work	Preparing presentation from textbooks of and internet
5	Theoretical	Transcription in eukaryotes, its activation and repression and transcription factors
	Laboratory	western blot, northern blot Southern Blot analysis
	Preparation Work	Preparing presentation from textbooks of and internet
6	Theoretical	Transcription in eukaryotes, its activation and repression and transcription factors
	Laboratory	RNA isolations
	Preparation Work	Preparing presentation from textbooks of and internet
7	Theoretical	RNA processing
	Laboratory	Preparation of cDNA library
	Preparation Work	Preparing presentation from textbooks of and internet
8	Theoretical	Preparing presentation from textbooks of and internet
9	Theoretical	mRNA Stability and Localization
	Laboratory	Real-time PCR
	Preparation Work	Preparing presentation from textbooks of and internet
10	Theoretical	DNA methylation
	Laboratory	Gradient PCR analysis

10	Preparation Work	Genomic imprinting
11	Theoretical	Genetic code
	Laboratory	DNA sequence analysis
	Preparation Work	Preparing presentation from textbooks of and internet
12	Theoretical	Next generation DNA sequencing
	Laboratory	DNA microarray analysis
	Preparation Work	Next generation DNA sequencing
13	Theoretical	Translation in eukaryotes, structure and function of tRNA, ribosomes and regulatory proteins
	Laboratory	Western Blot and zymogram
	Preparation Work	Preparing presentation from textbooks of and internet
14	Theoretical	The processing is required form a functional protein after translation
	Laboratory	Post-translational modifications
	Preparation Work	Preparing presentation from textbooks of and internet
15	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	15	2	2	60
Laboratory	14	1	1	28
Final Examination	1	11	1	12
			Total Workload (Hours)	100
			[Total Workload (Hours) / 25*] = **ECTS**	4

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes

1	At the end of the course students should be able to; know mechanisms of transcription, gene regulation, RNA processing and translation in bacteria & eukaryotes
2	explain how recent genomics and functional genomics advances are altering our views
3	apply molecular knowledge to understand and hypothesize about specific complex systems such as the HIV retrovirus and human disease states with underlying molecular dysfunction
4	interpret the results of experiments using standard molecular techniques such as gel shift, transcription run-on assay, linker scanning promoter analysis, etc
5	explain how classic experiments have led to our current understandings about DNA replication, recombination, transcription

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
P1	3	3	3	3	3
P2	3	3	3	3	3
P3	5	5	5	5	5
P4	5	5	5	5	5
P5	4	4	4	4	4
P6	3	3	3	3	3
P7	3	3	3	3	3

P8	4	4	4	4	4