



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Genetics and Biotechnology							
Course Code		FBÖ302		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	5	Workload	125 (<i>Hours</i>)	Theory	2	Practice	0	Laboratory	0
Objectives of the Course		Basic concepts and principles about genetics and biotechnology							
Course Content		Biotechnology, genetic technology, scope, significance, effect on our life and a brief overview of the historical development. Rise of Modern Genetics: Mendel's theories, crossbreeding, Mendel's laws. Cytoplasmic inheritance. Natural selection, adaptation, mutation. Molecular Biology. Gene Technology: Molecular genetics. Human genetics and genetic disorders. Gene engineering and the opportunities provided by society and science. Basic Principles of Biotechnology: Microbial metabolism, plant-animal cell cultures, fermentation, and fermentation technology, biotechnology, basic operations. Applications of biotechnology: the production of microbial biomass (baker's yeast, single cell protein), production of primary metabolites (citric acid, fumaric acid, acetic acid, amino acids, vitamins), Fermentation (alcoholic fermentation, lactic acid production, butyric acid, butanol, acetone), production of secondary metabolites (antibiotic), enzyme production, gene biotechnology, environmental biotechnology							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Project Based Study					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	70

Recommended or Required Reading

1	Genetike Başlarken, Vardar, Y., Kesercioğlu, T., Gelişim Basın Yayın Dağıtım, 2011, İzmir
2	Genetik, Yıldırım, A., Karadağ, Y., Kandemir, N., Sakin, M. A. Nobel Yayın Dağıtım, 2008, Ankara.
3	Genetik Kavramlar, Klug, W.S. & Cummings, M.R., Palme Yayıncılık, 2002. Ankara.

Week	Weekly Detailed Course Contents	
1	Theoretical	Definition of genetic biotechnology, fields, importance and historical development
	Preparation Work	
2	Theoretical	Birth of Modern Genetic Science: Mendel's theories, crossbreeding, Mendel's laws
	Preparation Work	
3	Theoretical	Cytoplasmic inheritance
	Preparation Work	
4	Theoretical	Natural selection, adaptation, mutation
	Preparation Work	
5	Theoretical	Molecular Biology
	Preparation Work	
6	Theoretical	Gene Technology: Molecular genetic
	Preparation Work	
7	Theoretical	Human genetics and genetic diseases
	Preparation Work	
8	Theoretical	Benefits of gene engineering
	Preparation Work	
9	Preparation Work	
	Intermediate Exam	Midterm exam
10	Theoretical	Basic principles of biotechnology: Microorganism metabolism Plant and animal cell cultures
	Preparation Work	
11	Theoretical	Basic principles of biotechnology: Fermentation and fermentation technology, biotechnology, basic operations
	Preparation Work	



12	Theoretical	Biotechnologic applications: Microbial biomass production (baker's yeast, single cell protein), production of primary metabolites (citric acid, fumaric acid, acetic acid, amino acids, vitamins)
	Preparation Work	
13	Theoretical	Biotechnologic applications: Fermentation (alcohol fermentation, production of lactic acid, butyric acid, butanol, acetone), the production of secondary metabolites (antibiotic), enzyme production
	Preparation Work	
14	Theoretical	Biotechnological applications: gene biotechnology, environmental biotechnology
	Preparation Work	
15	Theoretical	Biotechnological applications: gene biotechnology, environmental biotechnology
	Preparation Work	
16	Preparation Work	
	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	2	28
Assignment	14	0	2	28
Project	3	0	5	15
Reading	14	0	3	42
Midterm Examination	1	5	1	6
Final Examination	1	5	1	6
Total Workload (Hours)				125
[Total Workload (Hours) / 25*] = ECTS				5

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	To define Genetic Biotechnology, comprehend fields and importance, comprehend its historical development
2	To comprehend Mendel rules, comprehend crossings and deviations in Mendel theory
3	To comprehend cytoplasmic inheritance
4	Natural selection, adaptation and mutation
5	Define molecular biology
6	Define molecular genetics
7	Comprehend human genetics and genetic diseases
8	comprehend metabolism of microorganisms
9	Comparison of plant and animal cell cultures
10	Fermentation and fermentation technology, biotechnology, basic operations

Programme Outcomes (Science Teacher Education)

1	To be able to gain subject knowledge of profession in theory and practice in the learning process.
2	To be able to gain the competence of using the appropriate approach, strategy, method and technique for the instructional plans to be prepared in the learning process.
3	To be able to gain the skills of the teaching profession in the learning process.
4	To be able to implement teaching profession knowledge, skills, attitudes and habits related to the subject-matter in a real teaching and learning environment in the learning process.
5	To be able to comprehend contemporary approaches of education and the philosophy they are based on.
6	To be able to gain the basic skills such as comprehending, expressing, commenting, evaluating, being aware and enterprising, communicating, acknowledging the individual related to the subject-matter.
7	To be able to become individuals faithful to the Principles and Revolutions of Atatürk, be modern democratic, secular, protecting and developing one's country, being alive to the nation, respecting human rights, preserving the nature, not being discriminatory, giving importance to the traditions and customs, protecting the values
8	To be able to improve oneself in terms of sport, art and culture.
9	To be able to become individuals believing in lifelong learning.
10	To be able to gain the vision of being individuals who keep up with developments in social, economic, technological and scientific areas, who investigate the main reasons of World problems and try to contribute to the solutions of these 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	L6	L7	L8	L9	L10
P1	4	5	5	5	5	4	4	4	5	4
P2	4	4	4	4	5	5	5	4	4	5
P6	4	5	5	5	5	4	4	4	5	4
P10	3	4	4	4	3	4	5	5	5	5

