



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Biology III							
Course Code		FBÖ252		Course Level		First Cycle (Bachelor's Degree)			
ECTS Credit	4	Workload	100 ( <i>Hours</i> )	Theory	2	Practice	2	Laboratory	0
Objectives of the Course		The aim of this course is to comprehend functioning of the genetic basis and to transfer the development in scientific technolog to the students.							
Course Content		Genetic definition of biotechnology, fields, importance, influence our lives and a brief overview of historical development. Birth of Modern Science of Genetics: Mendel theory, dominance, codominance, multiple allelism the cross and deviations from Mendel theory. Sitoplazmik heredity, mutation. Molecular Biology. Gene Technology: Molecular Genetics. Human genetics and genetic diseases. Gene engineering and technology to provide the community facilities on science. Principles of biotechnology: microorganisms metabolism, plant-animal cell culture, fermentation, and fermentation technology, biotechnological basic operations. Biotechnological applications: Microbial biomass production (bread yeast, single cell protein), production of primary metabolites (citric acid, fumarik acid, acetic acid, amino acids, vitamins), yeast (alcohol by yeast, lactic acid production, bütirik acid, butanol, acetone), secondary metabolite production (antibiotics), enzyme production, gene biotechnology, environmental biotechnology. History of evolution biology;terms of evolution biology;the mechanisms of evolution:mutation, genetic drift, natural selection;macroevolution mechanisms: adaptation,speciation; history of life: pedigrees, fossil explorations; the first evolution of life in the world, the history of life, major evolutionary changes; applications of evolutionary biology: open and closed ended experiments on these topics.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment, Discussion, Project Based Study, 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	Genetik ve Biyoteknoloji, Filik İşçen, C., Aktan, B., Lisans Yayıncılık, 2019, İstanbul.
2	Genetike Başlarken, Vardar, Y., Kesercioğlu, T., Gelişim Basın Yayın Dağıtım, 2011, İzmir
3	Genetik, Yıldırım, A., Karadağ, Y., Kandemir, N., Sakin, M. A. Nobel Yayın Dağıtım, 2008, Ankara.
4	Genetik Kavramlar, Klug, W.S. & Cummings, M.R., Palme Yayıncılık, 2002. Ankara.

Week	Weekly Detailed Course Contents	
1	Theoretical	1. Definition of genetic biotechnology, fields, importance and historical development
2	Theoretical	2. Birth of Modern Genetic Science: Mendel's theories, crossbreeding, Mendel's laws
3	Theoretical	3. Cytoplasmic inheritance
4	Theoretical	4. Natural selection, adaptation, mutation
5	Theoretical	5. Molecular Biology
6	Theoretical	6. Gene Technology: Molecular genetic
7	Theoretical	7. Human genetics and genetic diseases
8	Theoretical	Midterm
9	Theoretical	9. Benefits of gene engineering
10	Theoretical	10. Basic principles of biotechnology: Microorganism metabolism Plant and animal cell cultures
11	Theoretical	11. Biyoteknolojinin Temel Prensipleri: Fermentasyon ve fermentasyon teknolojisi, biyoteknolojide temel işlemler.
12	Theoretical	12. Biotechnologic applications: Microbial biomass production (baker's yeast, single cell protein), production of primary metabolites (citric acid, fumaric acid, acetic acid, amino acids, vitamins)
13	Theoretical	13. Biotechnologic applications: Fermentation (alcohol fermentation, production of lactic acid, butyric acid, butanol, acetone), the production of secondary metabolites (antibiotic), enzyme production
14	Theoretical	14. History of life: pedigrees, fossil explorations



15	Theoretical	15. Genetics and medicine and open and closed-ended experiments on these topics.
16	Final Exam	final

**Workload Calculation**

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	1	2	42
Lecture - Practice	14	1	1	28
Assignment	12	0	1	12
Midterm Examination	1	6	1	7
Final Examination	1	10	1	11
Total Workload (Hours)				100
[Total Workload (Hours) / 25*] = ECTS				4

\*25 hour workload is accepted as 1 ECTS

**Learning Outcomes**

1	1 Introduction to genetics refers to the basic information.
2	2 Inheritance refers to the visual material, the principles of cytological.
3	3 Genetics shows examples of the monohybrid inheritance.
4	4 Genetics refers to the examples of the dihybrid inheritance.
5	5 Describes the functioning of genetic interactions.
6	6 Expresses multiple alleles.
7	7 Describes the identification of gender. Explain gender-related concepts.
8	8 Explain Linkage - Crossing-over.
9	9 Probability and genetic solutions to problems, and refers to the properties.
10	10 Describes the operation and characteristics of mutations.
11	11 Describes the Quantitative genetics and refers to the properties.
12	12 Describes the Population genetics and properties.

**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	L11	L12
P1	5	5	5	5	5	5	5	5	5	5	5	5
P2	4	4	5	4	4	4	5	4	5	5	4	5
P3	5	5	4	5	4	5	5	5	5	4	5	4
P4	4	4	5	4	5	4	4	4	5	5	4	5
P5	5	5	4	4	4	5	4	5		5	5	4
P6	5	5	5	5	5	5			5	5	4	5
P7	5	4	4	4	4	5	5	4	5	5	5	5
P8	4		5	5	5		4	5	5	5	4	5



P9	5	5	4	4	4	4	5	4	4	4	5	5
P10	4	4	5	5	4	5	4	4	5		4	5

