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1. Name of the Program: **Biology**

2. Aim of the Program

The main objective of the Department of Biology is to educate biologists who possess the knowledge and skills to define, explain, apply, and teach the fundamental principles of general biology and its five sub-disciplines (General Biology, Molecular Biology, Botany, Zoology, and Hydrobiology), and who are capable of making informed decisions within their field. Graduates are awarded the title of “Biologist” and are expected to carry out all professional responsibilities and authorities granted by relevant regulations. The Department of Biology conducts its academic and administrative activities in line with its vision under the coordination of the Faculty Dean’s Office and the Rectorate. The program aims to equip students with competencies that enable them to be employed in various sectors where biological sciences are applied. Key stakeholders of the department include TÜBİTAK, governmental institutions, universities, research centers, institutes, alumni, and professional organizations such as the Biologists Association.

With its strong academic staff and research-oriented approach, the department provides high-quality education and maintains a high level of research performance through projects supported by KTU-BAP, TAGEM, TUBITAK, and other external funding bodies. The department offers a positive learning and research environment and utilizes modern laboratory infrastructure to support student training. Additionally, motivated and successful students are given the opportunity to participate in ongoing research projects, encouraging them to pursue postgraduate studies and academic careers. The curriculum is structured progressively, building upon foundational knowledge from previous courses, including physics, chemistry, and mathematics, to prepare students for future professional and academic challenges.

3. Program Learning Outcomes (PLOS)

PLO-1: Have advanced theoretical and practical knowledge in the field of Biology.

PLO-2: Be able to use up-to-date theoretical and practical knowledge in Biology and communicate it effectively to the relevant target audience.

PLO-3: Be able to understand current phenomena and processes in Biology, compare them with similar cases, and generate evidence-based solutions.

PLO-4: Be able to collect, analyze, and interpret data related to biological problems, formulate hypotheses, and evaluate the results.

PLO-5: Be able to take an active role in the evaluation of biological phenomena.

PLO-6: Be able to plan and/or effectively conduct an activity in the field of Biology independently or as a team leader.

PLO-7: Be able to critically evaluate and update knowledge in Biology and demonstrate a commitment to lifelong learning.

PLO-8: Be able to develop solutions to problems in Biology and communicate them to the relevant audience.

PLO-9: Be able to communicate effectively, both orally and in writing, with colleagues at national and international levels by using information technologies.

PLO-10: Have a sense of social responsibility and be able to organize awareness projects and/or activities for the community.

PLO-11: Be able to evaluate all activities related to Biology with an awareness of universal scientific, cultural, and ethical values and use them for the benefit of society.

PLO-12: Have sufficient awareness of occupational health and safety and be able to apply this knowledge in professional and social life.



4. CAREER OPPORTUNITIES OF GRADUATES:

Graduates of the Biology program generally focus their career goals on life sciences and applied biology, and have the opportunity to work in a wide range of sectors including healthcare, environment, agriculture, food, biotechnology, and industry. In this context, graduates may be employed in both technical and managerial positions in public institutions, private sector organizations, research centers, and laboratories.

Biology graduates may work as:

- Biologist
- Laboratory Specialist
- Research and Development (R&D) Specialist
- Quality Control and Quality Assurance Specialist
- Biotechnology Specialist
- Environmental Officer / Environmental Consultant
- Occupational Health and Safety Specialist
- Food Control and Analysis Specialist
- Medical Laboratory Personnel
- Clinical Research Specialist
- Microbiology and Molecular Biology Specialist
- Researcher in Genetics and Biotechnology
- Technical Staff in the Pharmaceutical and Cosmetics Industry
- Seed Technology and Plant Tissue Culture Specialist
- Educator or Academic (Teacher/Researcher)
- Consultant and Inspection Specialist

In addition, in accordance with relevant regulations, graduates may serve as responsible managers in production facilities, laboratory supervisors, environmental impact assessment specialists, and authorized personnel in the fields of biocidal and medical products.

This broad range of career opportunities enables biology graduates to take active roles in various sectors through their interdisciplinary knowledge and skills.



5. PROGRAM CURRICULUM

BIOLOGY					
T: Theoretical	P: Practical	L: Laboratory	ECTS: European Credits Transfer System		
First Semester *					
Course Code	Course Name	T	P	L	ECTS
AITB1001	Ataturk's Principles and History of Turkish Revolution - I	2	0	0	2
BIY1001	General Biology - I	3	0	0	4
BIY1003	General Biology Laboratory - I	0	0	2	2
FIZ1005	General Physics	3	1	0	5
FIZ1011	General Physics Laboratory	0	0	2	2
KIM1005	Basic Chemistry	3	0	0	4
KIM1011	Basic Chemistry Laboratory	0	0	2	2
MAT1001	General Mathematics	2	2	0	5
TDB1001	Turkish Language - I	2	0	0	2
YDB1003	English - I	2	0	0	2
Total		17	2	6	30
Second Semester *					
Course Code	Course Name	T	P	L	ECTS
AITB1000	Ataturk's Principles and History of Turkish Revolution - II	2	0	0	2
BIY1000	Biostatistics	3	0	0	5
BIY1002	General Biology Laboratory - II	0	0	2	2
BIY1004	Biophysics	3	0	0	5
BIY1006	General Biology - II	3	0	0	5
KIM1018	Organic Chemistry	3	0	0	5
KIM1028	Organic Chemistry Laboratory	0	0	2	2
TDB1000	Turkish Language - II	2	0	0	2
YDB1004	English - II	2	0	0	2
Total		18	0	4	30
Third Semester *					
Course Code	Course Name	T	P	L	ECTS
BIY2005	Biology of Invertebrate Animals	3	0	0	4
BIY2007	Biology of Invertebrate Animals Laboratory	0	0	2	2
BIY2011	Plant Morphology and Anatomy	3	0	0	4
BIY2013	Plant Morphology and Anatomy Laboratory	0	0	2	2
BIY2023	Cell Biochemistry - I	3	0	0	4
BIY2025	Cell Biology	3	0	0	4
BIY2027	Cell Biology Laboratory	0	0	2	2
BIY2035	Professional Ethics	2	0	0	2
BIY2039	Project	0	2	0	2
	Professional English (Field-Specific Elective)	2	2	0	4
Elective Courses					
BIY2041	Professional English	2	0	0	4
BIY2043	English in Business Life	2	0	0	4
BIY2045	English Speaking Skills	2	0	0	4
BIY2047	Academic Reading and Writing Skills	2	0	0	4
Total		16	0	6	30
T: Theoretical	P: Practical	L: Laboratory	ECTS: European Credits Transfer System		
Fourth Semester *					
Course Code	Course Name	T	P	L	ECTS
BIY2002	Biology of Vertebrate Animals Laboratory	0	0	2	2



BIY2004	Cell Biochemistry - II	3	0	0	4
BIY2006	General Microbiology	3	0	0	5
BIY2010	Animal Histology Laboratory	0	0	2	2
BIY2012	General Microbiology Laboratory	0	0	2	2
BIY2014	Cell Biochemistry Laboratory	0	0	2	2
BIY2018	Internship	0	2	0	5
BIY2020	Biology of Vertebrate Animals	3	0	0	4
BIY2022	Animal Histology	3	0	0	4
Total		12	2	8	30
Fifth Semester *					
Course Code	Course Name	T	P	L	ECTS
BIY3005	Genetics-I	3	0	0	4
BIY3009	Animal Physiology Laboratory	0	0	2	2
BIY3011	Animal Physiology	3	0	0	3
BIY3017	Cryptogam Plants Biology Laboratory	0	0	2	2
BIY3019	Cryptogam Plants Biology	3	0	0	4
BIY3027	Ecology	3	0	0	3
	Elective Course 2 (Field-Specific)	3	0	0	4
	Elective Course 1 (Field-Specific)	3	0	0	4
	Elective Course 1 (Non Field)	2	0	0	4
Elective Courses					
BIY3003	Food Microbiology - Technical (Departmental) Elective	3	0	0	4
BIY3007	Hydrobiology - Technical (Departmental) Elective	3	0	0	4
BIY3015	Endocrinology - Technical (Departmental) Elective	3	0	0	4
BIY3023	Plant Embryology - Technical (Departmental) Elective	3	0	0	4
BIY3021	Entomology - Technical (Departmental) Elective	3	0	0	4
BIY3001	Plant Nutrition - Technical (Departmental) Elective	3	0	0	4
USEC0001	History of Science- Technical Elective (Non-Field)	2	0	0	4
USEC0003	Professional Ethics- Technical Elective (Non-Field)	2	0	0	4
USEC0005	General Sociology- Technical Elective (Non-Field)	2	0	0	4
USEC0007	Protection of Personal Data- Technical Elective (Non-Field)	2	0	0	4
USEC0009	Project Management- Technical Elective (Non-Field)	2	0	0	4
USEC0011	Career Planning- Technical Elective (Non-Field)	2	0	0	4
USEC0013	Technology Addiction- Technical Elective (Non-Field)	2	0	0	4
USEC0015	Project Management- Technical Elective (Non-Field)	2	0	0	4
USEC0017	Occupational Health and Safety- Technical Elective (Non-Field)	2	0	0	4
USEC0019	Sports Branch Courses- Technical Elective (Non-Field)	2	0	0	4
USEC0033	Certification, Accreditation and Quality- Technical Elective (Non-Field)	2	0	0	4
USEC0035	Quality Literacy- Technical Elective (Non-Field)	2	0	0	4
USEC0037	Volunteer Work- Technical Elective (Non-Field)	2	0	0	4
USEC0039	Human Rights- Technical Elective (Non-Field)	2	0	0	4
MTH3049	Fundamental Intellectual Property Rights-Technical Elective (Non-Field)	2	0	0	4
MTH3039	Functional Foods and Sectoral Applications-Technical Elective (Non-Field)	2	0	0	4
Total		20	0	4	30
Sixth Semester *					
Course Code	Course Name	T	P	L	ECTS
BIY3000	Seed Plants Biology Laboratory	0	0	2	2
BIY3002	Seed Plants Biology	3	0	0	4
BIY3006	Genetics-II	3	0	0	4
BIY3016	Plant Physiology Laboratory	0	0	2	2
BIY3018	Plant Physiology	3	0	0	4



BIY3022	Genetics Lab	0	0	2	2
	Elective Course II (Field-Specific)				4
	Elective Course I (Field-Specific)				4
	Elective Course I (Non-Field)				4
Elective Courses					
BIY3004	Radiobiology - Technical (Departmental) Elective	3	0	0	4
BIY3010	Ichthyology - Technical (Departmental) Elective	3	0	0	4
BIY3012	Plant Pathology - Technical (Departmental) Elective	3	0	0	4
BIY3024	Microbial Metabolism - Technical (Departmental) Elective	3	0	0	4
BIY3014	Microbial Genetics - Technical (Departmental) Elective	3	0	0	4
BIY3020	Animal Embryology - Technical (Departmental) Elective	3	0	0	4
USEC0002	History of Science- Technical Elective (Non-Field)	2	0	0	4
USEC0004	Professional Ethics- Technical Elective (Non-Field)	2	0	0	4
USEC0006	General Sociology- Technical Elective (Non-Field)	2	0	0	4
USEC0008	Protection of Personal Data- Technical Elective (Non-Field)	2	0	0	4
USEC00010	Project Management- Technical Elective (Non-Field)	2	0	0	4
USEC0012	Career Planning- Technical Elective (Non-Field)	2	0	0	4
USEC0014	Technology Addiction- Technical Elective (Non-Field)	2	0	0	4
USEC0016	Project Management- Technical Elective (Non-Field)	2	0	0	4
USEC0018	Occupational Health and Safety- Technical Elective (Non-Field)	2	0	0	4
USEC0024	Sports Branch Courses- Technical Elective (Non-Field)	2	0	0	4
USEC0034	Certification, Accreditation and Quality- Technical Elective (Non-Field)	2	0	0	4
USEC0036	Quality Literacy- Technical Elective (Non-Field)	2	0	0	4
USEC0038	Volunteer Work- Technical Elective (Non-Field)	2	0	0	4
	Human Rights- Technical Elective (Non-Field)	2	0	0	4
Total		17	0	6	30
Seventh Semester *					
Course Code	Course Name	T	P	L	ECTS
BIY4005	Molecular Biology Laboratory	0	0	2	2
BIY4037	Molecular Biology	3	0	0	7
	Elective Course II (Field-Specific)				7
	Elective Course I (Field-Specific)				7
	Elective Course III (Field-Specific)				7
Elective Courses					
BIY4021	Human Anatomy and Physiology - Technical (Departmental) Elective	3	0	0	7
BIY4009	Developmental Physiology in Plants - Technical (Departmental) Elective	3	0	0	7
BIY4011	Human Genetics - Technical (Departmental) Elective	3	0	0	7
BIY4033	Medicinal Plants - Technical (Departmental) Elective	3	0	0	7
BIY4027	Environmental Health - Technical (Departmental) Elective	3	0	0	7
BIY4025	Virology - Technical (Departmental) Elective	3	0	0	7
BIY4023	Plant Biochemistry - Technical (Departmental) Elective	3	0	0	7
BIY4031	Enzymology - Technical (Departmental) Elective	3	0	0	7
Total		3	0	0	30
Eighth Semester *					
Course Code	Course Name	T	P	L	ECTS
BIY4000	Undergraduate Graduation Project	2	2	0	5
BIY4030	Biotechnology	3	0	0	6
BIY4042	Evolution	2	0	0	4
	Elective Course II (Field-Specific)				5



	Elective Course I (Field-Specific)				5
	Elective Course III (Field-Specific)				5
Elective Courses					
BIY4006	Economical Botany - Technical Elective (Non-Field)	3	0	0	5
BIY4012	Toxicology - Technical Elective (Non-Field)	3	0	0	5
BIY4014	Environmental impact assessment - Technical Elective (Non-Field)	3	0	0	5
BIY4022	Vegetation Science - Technical Elective (Non-Field)	3	0	0	5
BIY4026	Biological Control - Technical Elective (Non-Field)	3	0	0	5
BIY4020	Immunology - Technical Elective (Non-Field)	3	0	0	5
BIY4044	Antioxidants and Human Nutrition - Technical Elective (Non-Field)	3	0	0	5
Total		3	0	0	30
TOTAL		98	8	36	240



6. PROGRAM LEARNING OUTCOMES (PLOs)

Code	Program Learning Outcome	Courses Contributing to the Outcome
LOP-1	Possesses advanced theoretical and practical knowledge in the field of Biology.	General Biology Laboratory-I; Basic Chemistry; Basic Chemistry Laboratory; General Mathematics; General Biology Laboratory-II; Invertebrate Biology; Invertebrate Biology Laboratory; Plant Morphology and Anatomy; Plant Morphology and Anatomy Laboratory; Cell Biochemistry; Cell Biology Laboratory; Vertebrate Biology Laboratory; General Microbiology; Animal Histology Laboratory; Internship; Vertebrate Biology; Animal Histology; Food Microbiology; Genetics I; Hydrobiology; Animal Physiology Laboratory; Animal Physiology; Endocrinology; Non-vascular Plant Biology Laboratory; Non-vascular Plant Biology; Entomology; Seed Plant Biology Laboratory; Seed Plant Biology; Radiobiology; Genetics II; Ichthyology; Microbial Genetics; Plant Physiology Laboratory; Animal Embryology; Genetics Laboratory; Microbial Metabolism; Molecular Biology Laboratory; Developmental Physiology in Plants; Human Genetics; Plant Biochemistry; Enzymology; Medicinal Plants; Molecular Biology; Immunology; Vegetation Science; Evolution; Antioxidants and Nutrition.
LOP-2	Uses up-to-date theoretical and practical knowledge in Biology and communicates this knowledge effectively to the relevant audience.	General Biology - I; General Biology Laboratory - I; General Physics; General Physics Laboratory; Basic Chemistry; Basic Chemistry Laboratory; Biophysics; Invertebrate Biology; Invertebrate Biology Laboratory; Cell Biology; English Speaking Skills; Academic Reading and Writing Skills; Vertebrate Biology Laboratory; Cell Biochemistry II; General Microbiology; Animal Histology Laboratory; Vertebrate Biology; Animal Histology; Food Microbiology; Genetics I; Hydrobiology; Animal Physiology Laboratory; Animal Physiology; Non-vascular Plant Biology Laboratory; Non-vascular Plant Biology; Entomology; Health and Society; Seed Plant Biology; Genetics II; Ichthyology; Microbial Genetics; Plant Physiology; Animal Embryology; Genetics Laboratory; Human Genetics; Human Anatomy and Physiology; Environmental Health; Enzymology; Medicinal Plants; Graduation Project; Economic Botany; Immunology; Biotechnology; Evolution.
LOP-3	Understands current phenomena and processes in the field of Biology, compares them with similar cases, and develops evidence-based solutions.	General Biology - I, General Biology - II; General Biology Laboratory - I; Biometry; General Biology Laboratory - II; Invertebrate Biology Laboratory; Cell Biochemistry; Cell Biology; Cell Biology Laboratory; Cell Biochemistry II; Plant Nutrition; Food Microbiology; Genetics I; Animal Physiology; Endocrinology; Non-vascular Plant Biology Laboratory; Non-vascular Plant Biology; Entomology; Plant Embryology; Genetics II; Plant Pathology; Microbial Genetics; Plant Physiology; Animal Embryology; Microbial Metabolism; Plant Biochemistry; Medicinal Plants; Graduation Project; Toxicology; Vegetation Science.
LOP-4	Collects and analyzes data related to biological problems, formulates hypotheses, and evaluates the results.	General Mathematics; Biometry; Turkish Language II; Invertebrate Biology Laboratory; Vertebrate Biology Laboratory; General Microbiology; Vertebrate Biology; Genetics I; Endocrinology; Non-vascular Plant Biology Laboratory; Non-vascular Plant Biology; Ecology; Seed Plant Biology Laboratory; Genetics II; Microbial Genetics; Genetics Laboratory; Microbial Metabolism; Molecular Biology Laboratory; Developmental Physiology in Plants; Virology; Medicinal Plants; Graduation Project; Environmental Impact Assessment; Evolution.
LOP-5	Takes an active role in the evaluation of biological phenomena.	General Biology Laboratory II; Organic Chemistry Laboratory; Invertebrate Biology; Plant Morphology and Anatomy; Plant Morphology and Anatomy Laboratory; Project; Vertebrate Biology Laboratory; Health and Society; Radiobiology; Plant Physiology; Animal Embryology; Plant Biochemistry; Immunology



LOP-6	Plans and effectively conducts activities in the field of Biology either independently or as a team leader.	General Physics; General Physics Laboratory; English II; Project; English Speaking Skills; Academic Reading and Writing Skills; Vertebrate Biology; Plant Nutrition; Plant Embryology; History of Science; General Sociology; Project Management; Career Planning; Plant Pathology; Genetics Laboratory; Molecular Biology Laboratory; Virology; Economic Botany; Toxicology
LOP-7	Updates knowledge in the field of Biology through critical inquiry and remains open to continuous learning	English II; Plant Morphology and Anatomy; Plant Morphology and Anatomy Laboratory; Vertebrate Biology Laboratory; General Microbiology; Vertebrate Biology; Hydrobiology; Health and Society; Career Planning; Radiobiology; Ichthyology; Microbial Genetics; Plant Developmental Physiology
LOP-8	Develops solutions to problems related to the field of Biology and communicates them to the target audience.	Biometrics; Cell Biology Laboratory; Project; English for Business; Cell Biochemistry Laboratory; History of Science; Career Planning; Seed Plant Biology Laboratory; Plant Physiology Laboratory; Biological Control; Biotechnology
LPO-9	Communicates verbally and/or in writing with colleagues at national and international levels using information technologies.	General Physics; General Physics Laboratory; Turkish Language I; English I; Biometrics; Professional English; English in Business; Internship; Vertebrate Biology; Health and Society; Career Planning; Environmental Health; Community Service Applications; Graduation Project; Environmental Impact Assessment; Work Psychology; Evolution
LOP-10	Demonstrates a sense of social responsibility and organizes awareness projects and/or activities for the community in which they live.	Atatürk's Principles and History of the Turkish Revolution I; Atatürk's Principles and History of the Turkish Revolution II; General Physics; General Physics Laboratory; Turkish Language I; Professional Ethics; Vertebrate Animal Biology; Project Management; Occupational Health and Safety; Technology Addiction; Virology; Community Service Applications; Work Psychology
LOP-11	Evaluates activities related to the field of Biology with an awareness of the universality of scientific, cultural, and ethical values and applies them for the benefit of society.	General Biology II; Professional Ethics; English in Business; Vertebrate Biology Laboratory; Vertebrate Biology; Hydrobiology; Ecology; Ichthyology; Technology Dependence; Environmental Health; Economic Botany; Environmental Impact Assessment; Biotechnology
LOP-12	Demonstrates sufficient awareness of the importance and necessity of occupational health and safety and applies this awareness in professional and social life.	Organic Chemistry Laboratory; Professional Ethics; General Sociology; Occupational Health and Safety; Environmental Health; Economic Botany; Environmental Impact Assessment; Biotechnology



7. COURSE INFORMATION FORM

Course Code	AITB1001
Course Name	Atatürk's Principles and History of the Turkish Revolution I
Course Subject/Content	<p>Course Subject: To examine and teach the concepts of revolution and related notions that led to the collapse of the Ottoman Empire and prepared the foundations of the Turkish Revolution; World War I; national reactions following the occupation of Anatolia; Mustafa Kemal Atatürk, his life and principles; the preparation period of the Turkish War of Independence; the establishment of the Grand National Assembly of Turkey (TBMM); the abolition of the Sultanate; the Treaty of Lausanne; and the proclamation of the Republic.</p> <p>Course Content: Historical concepts; sources and methods of historical research; the French Revolution and the Industrial Revolution; the decline of the Ottoman Empire; the Tanzimat and Reform Edicts; the First and Second Constitutional Periods; the Italo-Turkish War and the Balkan Wars; World War I; the Armistice of Mudros; Wilson's Principles; the Paris Peace Conference; Mustafa Kemal Atatürk, Samsun and Anatolia; the Amasya Circular; national congresses; the opening of the Ottoman Parliament; the establishment of the Grand National Assembly of Turkey (TBMM); internal revolts; the Constitution of 1921; the formation of the national army; the First Battle of İnönü; the Battles of Sakarya, Kütahya, and Eskişehir; the Great Offensive; agreements made during the War of Independence; the Treaty of Lausanne; and the abolition of the Sultanate.</p>
Course Hours	2
Course ECTS Credits	2
Course Outcomes	
LO-1	Understands the basic characteristics, purposes, and interrelationships of revolution and related concepts.
LO-2	Learns the basic internal and external factors that led to the collapse of the Ottoman Empire.
LO-3	Understands the reasons why the reform movements aimed at saving the Ottoman Empire from collapse were unsuccessful.
LO-4	Understands the importance of the awakening initiated by the Turkish nation under the leadership of Atatürk in response to the collapse of the Ottoman Empire and the occupation of the country at the end of World War I.
LO-5	Understands the importance of embracing and defending the Turkish Revolution and Atatürk's Principles.
LO-6	Gains the ability to recognize, use, and apply various written and visual sources, materials, and documents related to these topics.
COURSE SCHEDULE	
WEEKS	TOPICS
1	Introduction to the course and analysis of key concepts
2	Causes of the Turkish Revolution and the internal and external factors leading to the collapse of the Ottoman Empire
3	Reform movements in the Ottoman Empire: the Tanzimat Edict, the Reform Edict, the First Constitutional Period, and the Second Constitutional Period
4	Intellectual movements in the Ottoman Empire (Ottomanism, Islamism, Westernism, Turkism); the rise of the Committee of Union and Progress (CUP) to power; the 31 March Incident; the Trablusgarp War; and the Balkan Wars.
5	Causes of the First World War and the outbreak of the war; the Ottoman Empire's entry into the war; fronts and their outcomes
6	Agreements for the partition of the Ottoman Empire (Straits Agreement, London Agreement, Sykes-Picot Agreement, St. Jean de Maurienne Agreement), the end of World War I, the Armenian issue, and the Armistice of Mudros
7	The National Struggle period, the condition of the nation and the country under occupation, societies and their activities, Mustafa Kemal Pasha's arrival in Istanbul, and his evaluation of the situation.



10	The Balıkesir and Alaşehir Congresses; the Sivas Congress and its significance, other congresses during the National Struggle.	
11	The Amasya Protocol (Amasya Meetings); the meeting with commanders in Sivas; the arrival of the Representative Committee in Ankara; the convening of the last Ottoman Parliament; the National Pact (Misak-ı Milli).	
12	The opening of the Grand National Assembly of Turkey (TBMM) and its characteristics; the press during the National Struggle, rebellions against the TBMM, plans for the partition of Turkey.	
13	The establishment of the national army (Kuva-yi Milliye and the regular army), the Southern and Southeastern Fronts, and the Eastern Front (relations between the TBMM and Soviet Russia).	
14	The Armenian issue; wars with the Armenians, relations between the TBMM and Georgia, the Western Front (the First and Second Battles of İnönü, the Battle of Kütahya-Eskişehir).	
15	The Armenian issue; wars with the Armenians, relations between the TBMM and Georgia; the Western Front (the First and Second Battles of İnönü, the Battle of Kütahya-Eskişehir).	
16	FİNAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%
Ara Sınav	1	%50
Final	1	%50



Course Code	BIY1001	
Course Name	General Biology I	
Course Subject/Content	<p>Course Subject: To provide a clear understanding of the fundamental principles and basic concepts of biology.</p> <p>Course Content: Chemical composition of living organisms; structure and functions of macromolecules in living systems; structure and function of the cell; the cell cycle; metabolism; Mendelian genetics; the molecular basis of inheritance; basic concepts of biotechnology; biological diversity; and organism-environment interactions.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Understands the fundamental characteristics of the cell, including cellular hierarchy and metabolism.	
LO-2	Understands cell structure, cell division, growth, and development.	
LO-3	Understands the structure and replication of DNA.	
LO-4	Understands protein synthesis and gains knowledge about the molecular basis of heredity.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Historical development of the science of life	
2	Historical development of the science of life	
3	Chemical composition of living organisms	
4	Chemical composition of living organisms	
5	Structure and function of the cell	
6	Structure and function of the cell	
7	Cell division	
8	Metabolism (energy-requiring processes)	
9	MIDTERM EXAM	
10	Metabolism (energy-releasing processes)	
11	Heredity in living organisms	
12	Molecular basis of heredity	
13	Classification of living organisms and major groups of life	
14	Nutrition and reproduction in living organisms	
15	Biological communities and the environment	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance / Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY1003	
Course Name	General Biology Laboratory I	
Course Subject/Content	<p>Course Subject: To provide an introductory examination and practical application of the fundamental principles and basic concepts of biology.</p> <p>Course Content: Laboratory organization and general explanations; use of the microscope and preparation of specimens; examination of various cell types (plant and animal cells); importance and use of biological buffers; cytoplasmic movements; sectioning techniques and examination of cell substructures; types of stains used in cell staining and microscopic observation of stained cells; transport of substances (diffusion, osmosis, passive and active transport); examination of carbon compounds found in cells; some metabolic processes in living organisms (photosynthesis and respiration); chromatography.</p>	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Demonstrates how macroscopic and microscopic organisms can be examined using light microscopy and observation-based methods.	
LO-2	Examines biological samples using a light microscope and performs qualitative and quantitative analyses.	
LO-3	Demonstrates mitotic division in plant cells experimentally and classifies plants using their generative and vegetative organs.	
LO-4	Understands plant-water relationships.	
LO-5	Demonstrates mitotic division in plant cells experimentally and classifies plants using their generative and vegetative organs.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Laboratory organization and general explanations.	
2	Use of the microscope and preparation of specimens	
3	Use of the microscope and preparation of specimens.	
4	Examination of various cell types (plant and animal cells).	
5	Importance and use of biological buffers.	
6	Cytoplasmic movements, sectioning techniques, and examination of cell substructures.	
7	Types of stains used in cell staining and examination of stained cells.	
8	Transport of substances (diffusion, osmosis, passive and active transport).	
9	MIDTERM EXAM	
10	Examination of carbon compounds present in cells.	
12	Chromatography	
13	Chromatography	
14	Identification of low-organized organisms in the ecosystem	
15	Excursion: Identification of higher organisms in aquatic and terrestrial ecosystems	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance / Participation	-	-
Laboratory Exam	1	10%
Quiz	-	-
Homework	-	-
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	FIZ1005	
Course Name	General Physics	
Course Subject/Content	<p>Course Subject: To explain the fundamental concepts and principles of physics related to mechanics and electromagnetism through a clear presentation.</p> <p>Course Content: Introduction (units, physical quantities, and vectors); mechanics; electromagnetism; optics; and modern physics.</p>	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Applies the concepts of scalar and vector quantities to problem solving.	
LO-2	Solves problems related to force and motion and conducts experiments on uniform linear motion, free fall, and projectile motion, interpreting the results.	
LO-3	Solves problems involving energy, work, and power and performs experiments related to Newton's laws, motion on frictional surfaces, and coefficients of friction, interpreting the results.	
LO-4	Solves problems involving time, displacement, velocity, and acceleration in circular motion	
LO-5	Interprets electric fields and applies Gauss's law to different problems.	
LO-6	Discusses electrical potential.	
LO-7	Interprets the concepts of capacitance and dielectrics.	
LO-8	Analyzes current, resistance, and direct current (DC) circuits.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Physical quantities, vector representation, and example problems	
2	Velocity, displacement, and acceleration; motion in one dimension and example problems	
3	Motion in two dimensions and related problem solving	
4	Laws of motion and related problem solving	
5	Circular motion and Newton's laws; frictional force, circular motion, and example problems	
6	Work and kinetic energy	
7	Potential energy and conservation of mechanical energy	
8	Linear momentum, collisions, and center of mass: related problem solving	
9	MIDTERM EXAM	
10	Rotation, torque, and angular momentum: related problem solving	
11	Conditions of static equilibrium, center of gravity, and related problem-solving	
12	Electric charge, electric field, point and continuous charge distributions	
13	Electric potential; potential problems involving point and continuous charge distributions; physical properties of capacitors, and problem solving with capacitor circuits	
14	Electric current, resistance, and direct current (DC) circuits containing capacitors and sources; related problem-solving	
15	Magnetic field, sources of magnetic fields, Faraday's law, and inductance	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Type of Assessment	Type of Assessment
Attendance / Participation	Attendance / Participation	Attendance / Participation
Laboratory	Laboratory	Laboratory
Quiz	Quiz	Quiz
Homework	Homework	Homework
Midterm Exam	Midterm Exam	Midterm Exam
Final Exam	Final Exam	Final Exam



Course Code	FIZ1011	
Course Name	General Physics Laboratory	
Course Subject/Content	<p>Course Subject: To teach the topics of general physics through practical laboratory experiments.</p> <p>Course Content: Introduction to the General Physics Laboratory; length and measuring instruments for length; free fall; coefficient of static friction; coefficient of kinetic friction; simple pendulum; Atwood's machine; determination of the spring constant using spring force; determination of the spring constant from harmonic oscillation; equipotential lines; determination of resistivity; series and parallel resistor circuits; measurement of resistance using an ammeter and voltmeter; discharge of capacitors connected in series and parallel.</p>	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Applies the principles of mechanics and thermodynamics through laboratory experiments.	
LO-2	Performs experiments related to motion in one dimension and motion in two dimensions.	
LO-3	Conducts experiments related to basic concepts of electricity.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Grouping of students, introduction to laboratory equipment, and laboratory safety	
2	Free Fall	
3	Friction and Motion with Friction	
4	Mathematical and Physical Pendulum	
5	Independent Study / Free Experiment	
6	Atwood Makarası	
7	Spring and Oscillation	
8	Independent Study / Free Experiment	
9	MIDTERM EXAM	
10	Equipotential Lines	
11	Determination of Resistivity	
12	Independent Study / Free Experiment	
13	Series and Parallel Resistor Circuits	
14	Series and Parallel Capacitors	
15	Independent Study / Free Experiment	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance / Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	KIM1005	
Course Name	Basic Chemistry	
Course Subject/Content	<p>Course Subject: To understand the fundamental concepts of chemistry, the chemistry of nature, the types and causes of chemical reactions occurring in nature, the formation of chemical bonds, the importance of thermodynamic laws in chemistry, and the properties of matter.</p> <p>Course Content: Basic chemistry concepts; elements and their properties; atomic structure; chemical bonds; intermolecular interactions; chemical reactions; stoichiometry; redox reactions; thermochemistry; electrochemistry; and thermodynamics.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Analyzes the structure of matter and the atom and explains the properties of solids and gases.	
LO-2	Explains the periodic properties of elements and the concept of solubility.	
LO-3	Understands chemical bonds and chemical reactions.	
LO-4	Explains the basic principles of thermodynamics and energy.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Structure of Matter and the Atom	
2	Structure of Matter and the Atom	
3	Periodic Properties of Elements	
4	Periodic Properties of Elements	
5	Measurements and the Mole Concept	
6	Atomic Structure	
7	Chemical Equations,	
8	Chemical Equations	
9	MIDTERM EXAM	
10	General Properties of Solids and Liquids	
11	Chemical Reactions	
12	Chemical Reactions	
13	Gaseous State and Its Behavior	
14	Gas Laws and Gas Components	
15	Chemical Bonds	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance / Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	KIM1011	
Course Name	Basic Chemistry Laboratory	
Course Subject/Content	<p>Course Subject: To teach chemistry topics that may be useful for biologists through practical laboratory applications and to develop students' experimental skills and scientific thinking abilities.</p> <p>Course Content: Basic laboratory equipment and safety rules; preparation of solutions; acid-base titration (NaOH-HCl); separation techniques; organic models; synthesis of aspirin (acetylsalicylic acid); determination of molar mass by freezing point depression; determination of the vapor density of a volatile liquid; synthesis and properties of a simple salt; application of Charles's law; qualitative analysis (Fe(III), Co(II), Cu(II), Sb(III)).</p>	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Recognizes basic laboratory equipment.	
LO-2	Understands laboratory safety rules.	
LO-3	Prepares solutions.	
LO-4	Performs acid-base titrations.	
LO-5	Understands models of organic molecules.	
LO-6	Calculates molar mass.	
LO-7	Performs cation determination.	
LO-8	Conducts qualitative analysis.	
LO-9	Understands separation techniques.	
LO-10	Understands the synthesis and properties of a simple salt.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Basic Laboratory Equipment and Safety Rules	
2	Preparation of Solutions	
3	Acid-Base Titration (NaOH-HCl)	
4	Separation Techniques	
5	Organic Molecular Models	
6	Aspirin Synthesis (Acetylsalicylic Acid)	
7	Determination of Molar Mass by Freezing Point Depression	
8	Determination of the Vapor Density of a Volatile Liquid	
9	MIDTERM EXAM	
10	Synthesis and Properties of a Simple Salt	
11	Application of Charles's Law	
12	Qualitative Analysis of Fe(III)	
13	Qualitative Analysis of Co(II)	
14	Qualitative Analysis of Cu(II)	
15	Qualitative Analysis of Sb(III)	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance / Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	MAT1001	
Course Name	General Mathematics	
Course Subject/Content	<p>Course Subject: To teach fundamental mathematical techniques and introduce the mathematical skills necessary for analyzing problems, emphasizing the practical applicability of mathematics through numerous example problems.</p> <p>Course Content: Real numbers; exponential and radical expressions; absolute value; functions; types of functions and their basic graphs; limit and continuity; the concept of derivatives and derivative rules; increasing and decreasing functions; concavity; maximum and minimum problems; asymptotes and graph sketching; indefinite integrals and basic integration rules; the method of substitution; definite integrals; calculation of the area between curves using integrals; matrices and matrix operations; determinants and their properties; solutions of systems of linear equations.</p>	
Course Hours	4	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Learns fundamental mathematical techniques.	
LO-2	Develops basic mathematical skills.	
LO-3	Applies acquired mathematical skills to professional problems.	
COURSE SCHEDULE		
2	Concept of Functions, Domains and Graphs of Basic Functions	
3	Transformations of Basic Function Graphs, Exponential and Logarithmic Functions	
4	Limit of Functions, Limit at Infinity, Infinite Limits, Continuity	
5	Definition of Derivative, Rules of Differentiation (Chain Rule, Implicit Differentiation, Higher-Order Derivatives)	
6	Applications of Derivatives (Geometric Interpretation of the Derivative, Maximum–Minimum Problems)	
7	Applications of Derivatives (Maximum–Minimum Problems, Application of Derivatives to Limits)	
8	Indefinite Integrals, Substitution Method	
9	MIDTERM EXAM	
10	Integration by Parts, Partial Fraction Decomposition	
11	Definite Integral, Area Between Two Curves	
12	Matrices and Determinants	
13	Systems of Linear Equations	
14	Solution of Linear Systems Using Echelon Form	
15	Cramer’s Rule	
14	Solution of Linear Systems Using Echelon Form	
15	Cramer’s Rule	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance / Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	TDB1001
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Course Name	Turkish Language I	
Course Subject/Content	<p>Course Subject: To enable students to understand the structural features, functioning, and richness of the Turkish language and to develop awareness and appreciation of the mother tongue as a fundamental element of national unity.</p> <p>Course Content: Language and languages; the relationship between language and nation; the relationship between language and culture; languages of the world and the place of Turkish among world languages; language families based on their origins; historical development of the Turkish written language: Old Turkish, Middle Turkish, Divanü Lügati't-Türk, Atabetü'l-Hakayık, Khwarezm Turkish, Old Anatolian Turkish; the New Turkish period and the Modern Turkish period; Western and Southwestern Turkish; Turkey Turkish; Eastern (Northeastern) Turkish; Karatay Turkish. Phonetics (sound science): sound and the formation of sound; major and minor vowel harmony; major sound changes in Turkish; phonetic features of Turkish; syllable structure of Turkish; sentence stress. Morphology (word formation and structure): words in terms of form; roots; stems; affixes (derivational and inflectional suffixes); words in terms of meaning and function: nouns; adjectives; pronouns; verbs; verb conjugation; tense and aspect suffixes; verbals (participles, gerunds, infinitives); particles; words derived from verbs and nouns.</p>	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Recognizes the languages spoken in the world and the place of Turkish among world languages.	
LO-2	Expresses ideas effectively by developing a strong command of the Turkish language and gains acceptance in social contexts.	
LO-3	Understands and uses the mother tongue more effectively.	
LO-4	Uses scientific knowledge and information more effectively by mastering the mother tongue.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Language (Language- Nation Relationship / Language-Culture Relationship)	
2	Languages of the World	
3	Language Families According to Their Origins; Language Groups According to Their Structure	
4	Historical Periods of the Turkish Language: Historical Development of the Turkish Written Language	
5	Old Turkish- Middle Turkish- New Turkish- Modern Turkish	
6	Current Status of the Turkish Language and Its Areas of Use	
7	Phonetics (Sound System of Turkish)	
8	Phonetics; Morphology- Roots and Affixes (Derivational and Inflectional Suffixes)	
9	MIDTERM EXAM	
10	Words in Terms of Meaning and Function	
11	Semantics- Meaning in Words- Relationships Between Words	
12	Sentence Structure- Characteristics of Word Groups	
13	Types of Word Groups	
14	Elements of the Sentence	
15	Types of Sentences and Sentence Analysis	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance / Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%
Course Code	YDB1003	



Course Name	English I	
Course Subject/Content	Course Subject: To help students acquire basic language skills at the beginner level. Course Content: Basic English grammar; vocabulary development; reading, writing, listening, and speaking skills; simple conversations; and basic writing practice.	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Uses sentence patterns commonly used in daily life.	
LO-2	Construct sentences related to problems that may be encountered in daily life.	
LO-3	Writes letters, petitions, and similar texts using correct sentence patterns.	
LO-4	Understands reading passages and answers questions related to the texts.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Tenses: Simple Present and Present Continuous	
2	Adverbs and Nouns	
3	Quantifying Adjectives	
4	Pronouns, Possessive Adjectives, Possessive Pronouns, Possessive Structures	
5	Adjectives, Adverbs, and Comparisons	
6	Past Tense and Past Continuous Tense	
7	Prepositions	
8	Unit Review Exercises	
9	MIDTERM EXAM	
10	Relative Clauses and Relative Pronouns	
11	Relative Clauses and Pronouns	
12	Reflexive Pronouns, Interrogative Words (Which, etc.)	
13	Review of Units 6-9	
14	Perfect Tense, Present Perfect Tense	
15	Present Perfect, Past Perfect Tense, Expressions of Past Habits	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance / Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	AITB1000	
Course Name	Atatürk's Principles and History of the Revolution - II	
Course Subject/Content	<p>Course Subject: To provide accurate knowledge about Atatürk's Revolutions, the Atatürkist Thought System, and the history of the Republic of Türkiye, and to educate Turkish youth in accordance with the principles of Atatürkist thought.</p> <p>Course Content: Revolutions in the political sphere; the development of political parties and efforts to transition to a multi-party system; reforms in the legal system; regulation of social life; innovations in the economic field; Turkish foreign policy between 1923 and 1938; Turkish foreign policy after Atatürk; the principles of the Turkish Revolution (Republicanism, Populism, Secularism, Revolutionism, Statism, Nationalism); and complementary principles.</p>	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Students will be able to understand the significance of Atatürk's achievements in political, social, economic, legal, educational, and cultural fields in advancing the Republic of Turkey toward modern civilization.	
LO-2	Students will be able to grasp the importance of Atatürk's independent and honorable foreign policy and adopt the same ideas and actions. They will also develop awareness of the principle of "peace at home, peace in the world" and the importance of maintaining peace and stability.	
LO-3	Students will understand and embrace the meaning, importance, and goals of Atatürk's Principles, fostering a strong sense of commitment as advocates of these principles.	
LO-4	Students will develop the skills to identify, interpret, and utilize various written and visual resources, materials, and documents related to these topics.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Establishment of the National Army (Kuvayi Milliye, Regular Army). Southern and Southeastern Fronts	
2	Eastern Front (TBMM- Soviet Russia Relations, Armenian Question, Wars with Armenians, TBMM- Georgia relations)	
3	Western Front (First and Second İnönü Battles, Kütahya - Eskişehir Battle), Sakarya Field Battle, Great Offensive	
4	Social, Financial, and Weapons Resources of the National Struggle. Mudanya Armistice Agreement, Abolition of the Sultanate	
5	Lausanne Conference, Lausanne Peace Treaty, Opening of the Second TBMM	
6	Turkish Revolutionary Movements (Political Reforms), First Political Parties of the Republic Period, İzmir Assassination, Menemen Incident	
7	Legal Reform, Education, and Culture Reform (Education in the Republic Period)	
8	Studies in the fields of History, Language, and Fine Arts. Reforms in the Social Field	
9	MIDTERM EXAM	
10	Regulations in the Economic Field. Efforts to Create a National Economy	
11	Foreign Policy of the Republic of Turkey During the Atatürk Period. Foreign Policy Events of the 1923-1932 Period	
12	Foreign Policy Events of the 1932-1939 Period. Characteristics of tAtatürk Period Foreign Policy	
13	World War II and Turkey. Consequences of World War II for Türkiye	
14	Atatürk's Principles (Republicanism, Nationalism, Populism, Secularism)	
15	Atatürk's Principles (Statism, Revolutionism), Atatürk's Complementary Principles	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%



Final Exam	1	50%
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Course Code	BIY1000	
Course Name	Biometrics	
Course Subject/Content	<p>Course Subject: Understanding fundamental statistical concepts; teaching data collection and analysis methods; and using statistical software in data analysis.</p> <p>Course Content: Data analysis in biology; classification of data; measures of central tendency; probability distributions; binomial and Poisson distributions; standard normal distribution; Student's t-distribution; χ^2 distribution; confidence intervals and hypothesis testing; experimental designs; and various software tools used in data analysis.</p>	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Understands biometric concepts.	
LO-2	Identifies and defines various types of biometric systems and methods.	
LO-3	Uses and evaluates statistical techniques in data analysis.	
LO-4	Selects appropriate statistical methods for data analysis.	
LO-5	Applies suitable statistical techniques in data analysis.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Definition, importance, and biometric terms of biometrics	
2	Classification and graphical representation of biological data	
3	Descriptive Statistics: Measures of Central Tendency (Mean, Mode, Median)	
4	Descriptive Statistics: Measures of Dispersion (Variance, Standard Deviation, Standard Error, etc.)	
5	Probabilities	
6	Binomial and Poisson Distributions and Standard Normal Distribution	
7	Chi-Square Distribution, Statistical Estimation	
8	Using Excel and Software Packages in Data Analysis for Basic Statistical Analyses	
9	MIDTERM EXAM	
10	Hypothesis Testing	
11	Regression and Correlation	
12	Experimental Designs	
13	Analysis of Variance	
14	Multiple Comparison Tests	
15	Using Excel and Software Packages in Data Analysis for Variance, Regression, Correlation, ANOVA, etc.	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY1002	
Course Name	General Biology Laboratory - II	
Course Subject/Content	Course Content: Examination of biodiversity samples; demonstration of tissue types in organisms; analysis of the structure and functions of organs in various living organisms; study of different types of metamorphosis; demonstration of circulatory and transport systems; and examination of reproductive systems.	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Recognizes plant tissues.	
LO-2	Understands the reproduction, development, and growth of plants.	
LO-3	Explains the concepts of botany and zoology and their relationships with plant and animal systems.	
LO-4	Examines different organs and structures related to animal systems through experimental studies.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction	
2	Study of biological diversity, Protozoa	
3	Study of biological diversity, Protozoa	
4	Study of tissue types, Epithelial Tissue	
5	Study of tissue types, Epithelial Tissue	
6	Study of tissue types, Cartilage tissue	
7	Study of the structure and functions of organs	
8	Study of types of metamorphosis in living organisms with examples	
9	MIDTERM EXAM	
10	Study of types of metamorphosis in living organisms with examples	
11	Demonstration of circulatory and conduction systems in living organisms with examples	
12	Demonstration of circulatory and conduction systems in living organisms with examples	
13	Demonstration of developmental and reproductive systems in living organisms	
14	Demonstration of developmental and reproductive systems in living organisms	
15	Demonstration of developmental and reproductive systems in living organisms	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	1	10%
Quiz	-	-
Homework	-	-
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY1004	
Course Name	Biophysics	
Course Subject/Content	<p>Course Subject: To help students identify, define, and compare the basic components of cells; to introduce the concept of biophysics; to explain the structures and functions of biological components using principles of mathematics and physics; to enable students to critically analyze scientific articles related to biophysics; and to develop skills in project-based group work and oral presentation preparation and delivery.</p> <p>Course Content: General concepts of biophysics; fluid mechanics and living organisms; cellular biophysics; diffusion; osmosis; sound; biophysics of hearing; ultrasound; biophysics of vision; radioactivity and its biological effects; and medical imaging systems.</p>	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Understands the basic concepts of biophysics.	
LO-2	Analyzes the methods and problems of biophysics.	
LO-3	Explains the role of physics in daily life.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to Biophysics and Basic Concepts	
2	States of Matter	
3	States of Matter	
4	Fluid mechanics and living things	
5	Fluid mechanics and living things	
6	Surface effects in liquids	
7	Heat and temperature	
8	Heat and temperature	
9	MIDTERM EXAM	
10	Diffusion and osmosis	
11	Biophysics of hearing	
12	Biophysics of hearing	
13	Biophysics of vision	
14	Radioactivity, Radiation Dose Units, Biological Effects	
15	Ultrasound	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY1006	
Course Name	General Biology - II	
Course Subject/Content	<p>Course Subject: To help students understand the structure and development of plant cells, with emphasis on primary and secondary growth processes; to examine the relationships among tissue development, transport mechanisms in plants, growth, morphogenesis, and nutrition; and to introduce the basic concepts of animal cells, tissues, organ systems, and their physiological functions.</p> <p>Course Content: Structure, division, and growth of plant cells; plant tissues and primary and secondary growth; transport processes in plants; soil and mineral nutrition; growth and morphogenesis; animal cells and tissues; organ systems and their functions; animal physiology; classification of animals; and vertebrate system physiology.</p>	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Recognizes plant structures and explains their functions.	
LO-2	Describes the reproductive systems of plants.	
LO-3	Explains growth and development in plants.	
LO-4	Explains the concepts of botany and zoology and their relationships with plant and animal systems.	
LO-5	Identifies different organs and structures associated with animal systems.	
LO-6	Evaluates differences among animal systems and the physiological and biochemical differences among living organisms.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Plant structure and functions	
2	Plant structure and functions	
3	Plant structure and functions	
4	Animal structure and functions	
5	Animal structure and functions	
6	Animal structure and functions	
7	Plant reproduction, transport, and development	
8	Plant reproduction, transport, and development	
9	MIDTERM EXAM	
10	Plant reproduction, transport, and development	
11	Plant reproduction, transport, and development	
12	Circulatory and nervous systems in animals	
13	Circulatory and nervous systems in animals	
14	Animal reproduction and development	
15	Animal reproduction and development	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	KIM1018	
Course Name	Organic Chemistry	
Course Subject/Content	<p>Course Subject: To teach the correct representation of organic compounds and to understand their reactions.</p> <p>Course Content: Basic concepts of organic chemistry; writing, classification, and nomenclature of organic compounds; hydrocarbons; alkyl halides; aromatic compounds; alcohols; ethers; aldehydes; ketones; carboxylic acids; and their derivatives.</p>	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Writes organic compounds correctly and understands basic concepts of organic chemistry.	
LO-2	Explains the reactions associated with different classes of organic compounds.	
LO-3	Understands the reactions involved in the synthesis of organic compounds.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Writing organic compounds in linear and compressed forms	
2	Isomer, base, acid, resonance, formal charge, and functional group definitions.	
3	Introduction to hydrocarbons from organic compounds and the naming of alkanes and cycloalkanes.	
4	Naming of alkanes and cycloalkanes	
5	Naming of alkenes and introduction to the reactions they undergo	
6	Reactions of alkenes; continuing with reactions, then naming alkynes	
7	Reactions of alkynes	
8	Naming of aromatic compounds and their reactions	
9	MIDTERM EXAM	
10	Reactions of aromatic compounds	
11	Definition and naming of stereoisomers	
12	Naming of alkyl halides and examining the mechanisms of their reactions	
13	Examining the mechanisms of SN1 and SN2 reactions	
14	Naming of alcohols and ethers and their main reactions	
15	Naming of aldehydes and ketones and examining the mechanisms of their reactions	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	KIM1028	
Course Name	Organic Chemistry Laboratory	
Course Subject/Content	Course Content: Application of fundamental techniques used in organic chemistry; melting point determination; crystallization; boiling point determination; simple distillation; heating under reflux; fractional distillation; vacuum distillation; extraction; sublimation; steam distillation; chromatography (column and thin-layer); literature review; and organic compound analysis.	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Explains the determination of melting point.	
LO-2	Performs crystallization.	
LO-3	Explains the determination of boiling point.	
LO-4	Explains different types of distillation.	
LO-5	Applies column and thin-layer chromatography techniques.	
LO-6	Conducts a literature review.	
LO-7	Performs organic compound analysis.	
COURSE SCHEDULE		
1	Laboratory preparation and group selection	
2	Melting point determination	
3	Crystallization	
4	Boiling point determination	
5	Simple distillation	
6	Heating under reflux	
7	Fractional distillation	
8	Vacuum distillation	
9	MIDTERM EXAM	
10	Extraction	
11	Sublimation	
12	Water vapor distillation	
13	Chromatography (column and thin layer)	
14	Literature review	
15	Organic analysis and compensation	
16	FINAL EXAM	
16	DÖNEM SONU SINAVI	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	1	20%
Quiz	-	-
Homework	-	-
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	TDB1000	
Course Name	Turkish Language - II	
Course Subject/Content	<p>Course Subject: To help students understand the structural features, functioning, and richness of the Turkish language and to develop awareness and appreciation of the mother tongue as a fundamental element of national unity.</p> <p>Course Content: Spelling, punctuation, and composition; punctuation marks and other symbols; spelling and writing rules (capitalization, numbers, abbreviations, quoted words); composition (purpose, methods, and structure including introduction, development, and conclusion); narrative characteristics; clarity and simplicity in expression; openness and sincerity; common language errors (use of synonyms and incorrect idioms); narrative forms (exposition, narration, concise expression, description, satire, portrait, argumentation, speech); types of oral expression (daily and impromptu speech, prepared speech, open forum, debate, panel); types of written expression (letters, telegrams, greetings, invitations, literary letters); business and official correspondence (business letters, official letters, petitions, reports, minutes, decisions, announcements, advertisements); other written forms (conversations, criticism, memoirs, travel writing, interviews, surveys); and literary genres (autobiography, biography, novel, short story, fairy tale, fable, play, tragedy, drama, screenplay).</p>	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Recognizes the place of the Turkish language among world languages.	
LO-2	Expresses ideas effectively by developing a strong command of the Turkish language.	
LO-3	Understands and uses the mother tongue effectively.	
LO-4	Uses scientific knowledge and information effectively by mastering the mother tongue.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Punctuation Marks (Period, comma, semicolon, colon, exclamation mark, etc.)	
2	Punctuation Marks (Quotation marks, parentheses, etc.)	
3	Spelling Rules (Use of capital letters, spelling of numbers, compound words)	
4	Spelling Rules (Use of idioms, reduplications, quoted words, foreign proper nouns)	
5	Spelling Rules (Abbreviations and certain suffixes)	
6	Composition (Definition, purpose, and methods for success in writing)	
7	Methods for Writing Compositions (Creating supporting and main ideas, planning)	
8	Methods for Writing Compositions (Paragraph creation, developing ideas in paragraphs)	
9	MIDTERM EXAM	
10	Characteristics of Expression	
11	Expression Errors	
12	Forms of Expression	
13	Types of Expression (oral expression)	
14	Types of Expression (written expression - letter, petition...)	
15	Types of expression (written expression - story, novel, theater, poetry...)	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	YDB1004	
Course Name	English - II	
Course Subject/Content	Course Subject: To help students acquire basic language skills from the beginner to the pre-intermediate level. Course Content: English grammar; reading, writing, listening, and speaking skills; academic discussions; and writing practice.	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Uses A1-level English grammar structures in accordance with CEFR criteria.	
LO-2	Uses common sentence patterns in daily communication.	
LO-3	Writes letters, petitions, and similar documents using correct sentence structures.	
LO-4	Understands reading passages.	
LO-5	Communicates in simple and routine situations.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Grammar: Past Simple (2) questions, negatives Vocabulary: Prepositions in/at/on, Adverbs Reading: The story of two female firsts	
2	Listening: The good old days Speaking: Talking about you, your life, What do you think?, Telling a story Everyday English: Special occasions Writing: Telling a story, time expressions	
3	Grammar: Count and uncount nouns, some/any/a lot of Do you like ??/Would you like ?? much/many Vocabulary: food and drink, daily needs Reading: We all love ice cream! (the history)	
4	Listening: A meal to remember Speaking: Talking about you, In your own words, What do you think? Everyday English: Shopping in the High Street Writing: Formal/informal writing	
5	Grammar: Comparative adjectives, have got, superlative adjectives Vocabulary: town and country, prepositions of movement	
6	Reading: Life at the top Listening: An American in London, Getting around Sherford	
7	Reading: Life at the top Listening: An American in London, Getting around Sherford	
8	Grammar: Present Continuous, Questions, negatives Whose or who?s Vocabulary: Describing people, appearance, clothes Reading: One minute in the life of the world	
9	MIDTERM EXAM	
10	Listening: What is happening in the world right now? The global statistics, Describing people Speaking: Talking about you, What do you think?, Describing people Everyday English: Everyday situations Writing: Comparing and Contrast, Linking words (3) but/however/although	
11	Grammar: going to future, seeing the future now, infinitive of purpose Vocabulary: places and activities, what?s the weather like? Reading: Human towers	
12	Listening: Why am I going there? What?s the weather going to be like? Speaking: Talking about you, role play, what do you think? What?s the weather like? Everyday English: Making suggestions Writing: Describing a holiday	
13	Grammar: Present Perfect, tense revision Vocabulary: take and get, transport and travel	
14	Reading: Explorers ? ancient and modern Listening: Who is it? Descriptions of past explorers	
15	Speaking: Talking about you, What do you think? Everyday English: Transport and travel Writing: A poem, Choosing the right word	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2005	
Course Title	Invertebrate Animal Biology	
Course Objective/Content	<p>Course Objective: To provide students with an understanding of the characteristic features of invertebrate animals, as well as their roles and ecological significance within ecosystems.</p> <p>Course Content: Unicellular animals; multicellular animals including Porifera (sponges), Cnidaria (polyps and jellyfish), Ctenophora (comb jellies), Platyhelminthes (flatworms), Nematoda (roundworms), Annelida (segmented worms), Mollusca (mollusks), Arthropoda (arthropods), and Echinodermata (echinoderms); field study.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can explain the concept of species in animals, including its formation and ecological roles.	
LO-2	Can identify the systematics of any invertebrate animal in their environment and understand its role in the ecosystem.	
LO-3	Can explain the ecological roles and economic importance of invertebrate animals.	
LO-4	Can demonstrate knowledge of methods for collecting invertebrate animals from natural environments.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to systematics and its importance.	
2	Systematics, anatomy, and ecological roles of unicellular animals.	
3	Systematics, anatomy, and ecological roles of Porifera (sponges), Cnidaria (coelenterates), and Ctenophora (comb jellies).	
4	Documentary screening on the ecological roles of sponges and coelenterates.	
5	Systematics, anatomy, and ecological roles of Platyhelminthes (flatworms).	
6	Systematics, anatomy, and ecological roles of Rotifera and Nematoda (roundworms).	
7	Systematics, anatomy, and ecological roles of Annelida (segmented worms).	
8	Systematics, anatomy, and ecological roles of Mollusca (mollusks). Additionally, field observation of organisms covered in Weeks 6–8 at the coastal area of KTÜ seaside facilities.	
9	MIDTERM EXAM	
10	Documentary screening on the ecological roles of Cephalopoda.	
11	Systematics, anatomy, and ecological roles of non-antennae arthropods.	
12	Systematics, anatomy, and ecological roles of antennae-bearing arthropods.	
13	Documentary screening on the ecological roles of arthropods.	
14	Systematics, anatomy, and ecological roles of Myriapoda.	
15	Systematics, anatomy, and ecological roles of Echinodermata.	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2007	
Course Title	Invertebrate Biology Laboratory	
Course Objective/Content	Course Objective: To introduce invertebrate animals and to teach their roles and benefits. Course Content: Examination of the morphology and anatomy of invertebrate animals, from unicellular organisms to echinoderms.	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Can understand the importance of systematics.	
LO-2	Can identify animals.	
LO-3	Can collect animals.	
LO-4	Can understand the roles of animals in the ecosystem.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	General introduction	
2	Unicellular organisms	
3	Unicellular organisms	
4	Porifera (sponges)	
5	Jellyfish and corals (Cnidaria)	
6	Parasitic worms	
7	Nematodes (roundworms)	
8	Annelids (segmented worms)	
9	MIDTERM EXAM	
10	Mollusks	
11	Non-antennae arthropods	
12	Antennae-bearing arthropods	
13	Myriapods	
14	Echinoderms	
15	Field study	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY2011	
Course Title	Plant Morphology and Anatomy	
Course Objective/Content	<p>Course Objective: To examine the cellular characteristics, tissue types and their properties, and the morphological and anatomical features of vegetative and generative organs of higher plants, as well as the differences among plant groups and their changes throughout the phylogenetic process.</p> <p>Course Content: General structure of higher plants; characteristics of the plant cell; plant tissues and their functions; morphological and anatomical structure of vegetative organs and their functions; structure and functions of generative organs in plants.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can describe the morphological and anatomical characteristics of plants.	
LO-2	Can distinguish between plant and animal cells.	
LO-3	Can demonstrate increased knowledge of plant structures.	
LO-4	Can distinguish the structural differences between root and stem anatomy.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	General structure of a plant	
2	General structure of the plant cell	
3	Structure of the cell wall	
4	Plant tissues: Meristems	
5	Epidermis and stomata	
6	Parenchyma and collenchyma	
7	Sclerenchyma	
8	Vascular tissue and vascular bundles	
9	MIDTERM EXAM	
10	Secretory tissues (secretory structures)	
11	Root morphology and primary and secondary structure	
12	Stem primary and secondary structure	
13	Gymnosperm and angiosperm wood	
14	Morphological and anatomical structure of the leaf	
15	Flower, fruit, and seed characteristics	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY2013	
Course Title	Plant Morphology and Anatomy Laboratory	
Course Objective/Content	<p>Course Objective: To examine the anatomical structures of tissues and organs of higher plants.</p> <p>Course Content: Plant cell. Crystals in plant cells. Epidermis and stomata. Ground tissue. Collenchyma. Sclerenchyma. Collateral vascular bundle type. Bicollateral vascular bundle type. Root anatomy. Anatomical structure of the stem. Gymnosperm wood. Angiosperm wood. Anatomy of gymnosperm leaves. Anatomy of angiosperm leaves.</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Identify plant cells.	
LO-2	Describe the structure and function of plant tissues.	
LO-3	Explain the anatomical organization of plant organs.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Plant Cell	
2	Crystals in Plant Cells	
3	Epidermis and Stomata	
4	Ground Tissues	
5	Collenchyma	
6	Sclerenchyma	
7	Collateral Vascular Bundle Type	
8	Bicollateral Vascular Bundle Type	
9	MIDTERM EXAM	
10	Root Anatomy	
11	Stem Anatomy	
12	Gymnosperm Wood	
13	Angiosperm Wood	
14	Anatomy of Gymnosperm Leaves	
15	Anatomy of Angiosperm Leaves	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	15%
Midterm Exam	1	35%
Final Exam	1	50%



Course Code	BIY2023	
Course Title	Cell Biochemistry I	
Course Objective/Content	<p>Course Objective: To understand the structure–function relationships of biomolecules in living systems.</p> <p>Course Content: Scope of biochemistry. Concepts of life and cell. Interactions of biomolecules in aqueous environments. Amino acids and proteins. Structure of proteins. Protein function: Hemoglobin. Protein function: Enzymes. Enzyme mechanisms of action. Antibodies. Biomembranes and signal transduction. DNA structure and replication. RNA synthesis and processing. Protein synthesis.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Explain the structure and functions of cells and macromolecules in detail.	
LO-2	Conduct detailed research on cell structure, functions, and metabolic pathways.	
LO-3	Describe cellular metabolism in detail.	
LO-4	Discuss the importance of cell structure, functions, and metabolic pathways.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Cell Structure	
2	Cell Imaging Techniques	
3	Amino Acids and Proteins	
4	Enzymes	
5	Immune System and Antibodies	
6	Antibodies and Antibody Synthesis	
7	Biological Membranes	
8	Signal Transduction in Cells	
9	MIDTERM EXAM	
10	Structure of DNA	
11	DNA Replication	
12	RNA Synthesis: Transcription in Prokaryotes	
13	RNA Synthesis: Transcription in Eukaryotes	
14	Protein Synthesis: Genetic Code and Translation in Prokaryotes	
15	Protein Synthesis: Translation in Eukaryotes	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2025	
Course Title	Cell Biology	
Course Objective/Content	<p>Course Objective: To teach the structure, molecules, and functions of prokaryotic and eukaryotic cells.</p> <p>Course Content: Historical developments in cell biology. General structure of cells. Chemical composition of cells. Microscopic techniques in cell biology. Biochemical techniques in cell biology. Molecular techniques in cell biology. Cell organelles and their functions. Cell division. Transmission of genetic information. Normal and abnormal changes in cells.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Compare the structural and functional features of prokaryotic and eukaryotic cells.	
LO-2	Explain current and emerging topics in cell biology.	
LO-3	Critically discuss contemporary issues in cell biology with peers.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Historical Developments in Cell Biology	
2	General Structure of Cells	
3	Chemical Composition of Cells	
4	Chemical Composition of Cells	
5	Microscopic Techniques in Cell Biology	
6	Biochemical Techniques in Cell Biology	
7	Molecular Techniques in Cell Biology	
8	Cell Organelles and Their Functions	
9	MIDTERM EXAM	
10	Cell Organelles and Their Functions	
11	Cell Organelles and Their Functions	
12	Cell Organelles and Their Functions	
13	Cell Division	
14	Transmission of Genetic Information	
15	Normal and Abnormal Changes in Cells	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2027	
Course Title	Cell Biology Laboratory	
Course Objective/Content	<p>Course Objective: To gain knowledge of cell biology by examining the structure and functions of cells.</p> <p>Course Content: Laboratory environment and safety rules in cell biology. Use of the microscope and cell diversity. Microscopic units and measurement under the microscope. Sectioning, staining, and preparation of permanent slides. Microscopic examination of cell organelles. Cell culture techniques. Preparation of pH solutions and biological buffers. Centrifuges and centrifugation. Isolation and analysis of cell components, proteins, and nucleic acids. Enzymes and enzyme activity. Cell division and chromosome morphology. Transport of substances across cells.</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Explain the structural and functional properties of cells.	
LO-2	Perform essential laboratory techniques in cell biology.	
LO-3	Interpret and discuss experimental results and laboratory experiences collaboratively.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Laboratory Environment and Safety Rules in Cell Biology	
2	Use of the Microscope and Cell Diversity	
3	Microscopic Units and Measurement under the Microscope	
4	Sectioning, Staining, and Preparation of Permanent Slides	
5	Microscopic Examination of Cell Organelles	
6	Cell Culture Techniques	
7	Preparation of pH Solutions and Biological Buffers	
8	Centrifuges and Centrifugation	
9	MIDTERM EXAM	
10	Isolation and Analysis of Cell Components, Proteins, and Nucleic Acids	
11	Enzymes and Enzyme Activity	
12	Homework Submission	
13	Cell Division and Chromosome Morphology	
14	Transport of Substances across Cells	
15	Photosynthesis and Respiration	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2035	
Course Title	Professional Ethics	
Course Objective/Content	<p>Course Objective: To examine the concepts of ethics and morality, analyze ethical systems, and explore the factors influencing the development of moral values. The course also aims to provide knowledge about professional ethics and to introduce ethical principles relevant to students who will work as biologists.</p> <p>Course Content: Professional ethics. Types of ethics. Ethics in education. Regulations and laws related to ethics. Ethical principles to be followed in professional practice.</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Evaluate issues from the perspective of universal, social justice, and environmental values.	
LO-2	Demonstrate awareness of global challenges while considering national interests and contributing as a productive individual.	
LO-3	Apply professional ethical principles in workplace practices.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Definition of Ethics	
2	Moral Development Process	
3	Ethical Systems	
4	Relationship between Ethics and Society	
5	Outcomes of Ethical Behavior	
6	Social Degeneration	
7	Concept of Professional Ethics	
8	Principles of Professional Ethics	
9	MIDTERM EXAM	
10	Ethical and Unethical Issues in Working Life	
11	Professional Degeneration	
12	Ethical Principles in Different Professions	
13	Working in an Ethical Workplace Environment	
14	Impact of Ethical Working Conditions on Work and the Workplace	
15	Impact of Ethical Working Conditions on Employees	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2039
Course Title	Project
Course Objective/Content	<p>Course Objective: To encourage students to develop project proposals and to provide them with fundamental knowledge, skills, and confidence in project writing and management. The course aims to enable students to prepare project proposals under the supervision of an advisor for submission to funding bodies such as universities, TÜBİTAK, the European Union, and other national and international institutions. It also aims to develop students' entrepreneurial knowledge and skills, equipping them with the competencies necessary to establish their own initiatives.</p> <p>Course Content: Concept and types of projects. Project-based learning and educational programs. Project funding sources (TÜBİTAK, EU, and others). Topic selection for projects. Literature review. Logical framework approach in project design. Project planning and management. Application of the scientific method in projects. Preparation and development of project reports. Finalization of project reports. Project evaluation and analysis of best practices. Project presentations and techniques for designing posters and brochures.</p>
Course Hours	2
ECTS Credits	2
Learning Outcomes	
LO-1	Develop an original idea and formulate it as a project proposal.
LO-2	Evaluate a project based on defined criteria.
LO-3	Demonstrate theoretical and practical knowledge of project preparation and management.
LO-4	Demonstrate theoretical and practical knowledge of entrepreneurship and establishing a business.
COURSE SCHEDULE	
WEEKS	TOPICS
1	Introduction to the Project: Introduction of faculty members, research areas, and potential research topics
2	Project, R&D and Innovation Concepts: What is a project? What is innovation? What is R&D according to the Frascati Manual? How does an idea become a project? How is a project topic selected? Ethical considerations in project writing; announcement of project topics
3	Challenges in Project Preparation: Key considerations for effective project writing; components of ARDEB proposals; evaluation of R&D criteria; meeting faculty members and finalizing project topic–advisor–student matching; announcement of proposal format
4	Originality of the Project: How to write the originality section effectively; criteria for originality; is studying a topic for the first time sufficient for originality?
5	Research Question/Hypothesis, Aim and Objectives: Writing clear, measurable, realistic, and achievable aims and objectives; title, abstract, scope, and literature review
6	Methodology: Components of the method; selection of research design; data collection techniques and tools; validity and reliability; data analysis; ethical considerations in project management
7	Project Management: Team formation; work packages; task distribution and timelines; Gantt chart; planning responsibilities; success criteria; risk identification and risk management; contingency plans
8	Dissemination and Impact: Expected outputs and impacts; types of impact; dissemination strategies; activities, products, and services; contribution to national development; ethics in publication
9	Midterm Exam
10	Budget and Justification: How to prepare a project budget; key considerations; components of a strong budget
11	Project Application and Evaluation Process: National and international funding sources; proposal consistency; evaluation criteria; required documents; electronic submission procedures



12	Entrepreneurship I: Basic concepts; characteristics and skills of entrepreneurs; types of entrepreneurship; entrepreneurial culture; ethics in entrepreneurship; organizational culture and communication
13	Entrepreneurship II: Local entrepreneurship; change management; sustainable development; entrepreneurship financing; business plan components (market research, marketing, production, management, financial planning)
14	Scientific Writing Principles: Project, thesis, and article writing guidelines and applications
15	Presentations: Student presentations of project, thesis, and articles; submission of project proposals
16	Oral Exam: Presentation and evaluation of the project proposal before the advisor and jury (e.g., TÜBİTAK, KTU-BAP formats)

ASSESSMENT METHODS AND GRADING

Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	-	-
Final Exam	1	100%



Course Code	BIY2041	
Course Title	Vocational English	
Course Objective/Content	<p>The aim of this course is to improve students' basic English speaking skills for daily life, academic settings, and professional environments. The course enables students to introduce themselves, express opinions, ask and answer questions, make presentations, and communicate about basic biology-related topics in English.</p> <p>This course covers basic speaking patterns, daily communication, self-introduction, asking and answering questions, expressing opinions, discussions, presentations, and the oral use of basic English terminology related to biology. The course is student-centered and conducted through speaking activities, group work, dialogues, and short presentations.</p>	
Course Hours	2	
ECTS Credits	4	
Learning Outcomes		
LO-1	Communicate orally in English at a basic level on daily life, educational, and social topics.	
LO-2	Deliver short speeches and presentations in English about themselves, their education, and their interests.	
LO-3	Use basic biological concepts and terminology to make simple explanations and respond to questions in English.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Course introduction and placement activities	
2	Introducing yourself and personal information	
3	Daily life and routine activities	
4	Hobbies, interests, and free-time activities	
5	Family, friends, and social life	
6	Talking about university life and education	
7	Expressing opinions and preferences	
8	Introduction to biology: Basic biological concepts	
9	MIDTERM EXAM	
10	Talking about living organisms and the environment	
11	Laboratory and scientific study terminology	
12	Oral interpretation of graphs, tables, and results	
13	Preparing and delivering short academic presentations	
14	Preparing and delivering short academic presentations	
15	Review and final presentations	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2043	
Course Title	English for Business Life	
Course Objective/Content	<p>Course Objective: To help students acquire the terminology necessary to follow literature in their field and to develop written and oral communication skills required in professional settings, including presentations, meetings, correspondence, and workplace interactions.</p> <p>Course Content: English for employees and managers in professional settings. Common business correspondence styles. Introduction to postgraduate studies. Research areas and academic writing. Workplace challenges. Preparing presentations. Writing curriculum vitae (CV) and application letters.</p>	
Course Hours	2	
ECTS Credits	4	
Learning Outcomes		
LO-1	Read and analyze written sources such as articles, texts, and reports.	
LO-2	Write CVs, job application letters, and reports.	
LO-3	Demonstrate communication skills for evaluating workplace situations and engaging in professional dialogue.	
LO-4	Recognize and use vocabulary related to business English.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Defining Jobs and Professions	
2	Ways of Working	
3	Recruitment and Selection	
4	Skills and Qualifications	
5	Pay and Benefits	
6	Employees and Workplaces; Career Paths	
7	Problems in Working Life	
8	Executives, Managers, Directors, Businesspeople, and Leaders	
9	MIDTERM EXAM	
10	Modes of Production: Production and Services, Innovation and Invention, Ways of Development	
11	Communication: Telephone, Fax, and E-mail	
12	Presentations: Preparation and Introduction, Main Theme, Conclusion and Questions	
13	Presentations	
14	Preparing a CV and Application Letter	
15	Business Meetings: Interviews and Discussions	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	1	20%
Homework	-	-
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY2045	
Course Title	English Speaking Skills	
Course Objective/Content	<p>Course Objective: To develop students' ability to communicate effectively in English by improving their speaking, listening, and interaction skills in various contexts.</p> <p>Course Content: Basic speaking strategies. Pronunciation and fluency. Everyday conversations. Expressing opinions and ideas. Describing events and experiences. Group discussions and role-plays. Presentation skills. Listening and responding in conversations.</p>	
Course Hours	2	
ECTS Credits	4	
Learning Outcomes		
LO-1	Communicate effectively in spoken English in daily and academic contexts.	
LO-2	Participate actively in discussions and interactive speaking activities.	
LO-3	Express ideas and opinions clearly and fluently.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introducing Yourself and Others	
2	Daily Conversations	
3	Expressing Opinions and Agreeing/Disagreeing	
4	Describing Experiences and Events	
5	Group Discussions and Role-Plays	
6	Presentation Skills	
7	Listening and Responding	
8	Debates and Interactive Speaking activities	
9	Midterm Exam	
10	Pronunciation and Fluency Practice	
11	Academic Speaking Skills	
12	Giving Short Presentations	
13	Question and Answer Techniques	
14	Final Exam	
15	Introducing Yourself and Others	
16	Daily Conversations	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	1	20%
Homework	-	-
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY2047	
Course Title	Academic Reading and Writing Skills	
Course Objective/Content	<p>Course Objective: To enable students to search for scientific articles in the literature, read biology papers critically, understand the structure of scientific articles, explain and summarize scientific texts, and develop academic writing skills without plagiarism while using references correctly.</p> <p>Course Content: Introduction to academic reading and writing in biology. Structure of research articles in biology. Literature search for finding scientific articles. Working on the abstract section of scientific texts. Writing the introduction section. Writing the materials and methods section. Writing the results section. Writing the discussion section. Critical reading of biology articles. Citation and referencing in biology. Academic integrity and avoiding plagiarism. Writing a literature review in biology.</p>	
Course Hours	2	
ECTS Credits	4	
Learning Outcomes		
LO-1	Search for scientific articles in the literature.	
LO-2	Critically read and analyze biology research papers.	
LO-3	Explain and summarize scientific articles effectively.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to Academic Reading and Writing in Biology	
2	Structure of Research Articles in Biology	
3	Literature Search for Research Articles in Biology	
4	Working on the Abstract Section of Scientific Texts	
5	Working on the Introduction Section	
6	Working on the Materials and Methods Section	
7	Working on the Results Section	
8	Working on the Discussion Section	
9	MIDTERM EXAM	
10	Critical Reading of Biology Articles	
11	Citation and Referencing in Biology	
12	Academic Integrity and Avoiding Plagiarism	
13	Writing a Literature Review in Biology	
14	Oral Assessment	
15	Article Reading	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY2002	
Course Title	Vertebrate Biology Laboratory	
Course Objective/Content	<p>Course Objective: To raise students' awareness of the characteristic features of vertebrate animals and their roles and positions within ecosystems.</p> <p>Course Content: Primitive vertebrates. Jawless fishes. Cartilaginous fishes. Bony fishes. Amphibians. Reptiles. Birds and mammals.</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Identify the taxonomy of vertebrate animals and describe their roles in ecosystems.	
LO-2	Explain the ecological roles and economic importance of vertebrate species.	
LO-3	Demonstrate appropriate methods for collecting vertebrate specimens from natural environments.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Primitive Vertebrates	
2	Jawless Fishes	
3	Cartilaginous Fishes	
4	Bony Fishes	
5	Amphibians	
6	Reptiles (Turtles)	
7	Reptiles (Lizards)	
8	Reptiles (Snakes)	
9	MIDTERM EXAM	
10	Field Trip	
11	Birds	
12	Practical Studies on Birds	
13	Mammals	
14	Studies on Primates	
15	Evaluation of Homeworks	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY2004	
Course Title	Cell Biochemistry II	
Course Objective/Content	<p>Course Objective: To understand the structure–function relationships of biomolecules in living systems.</p> <p>Course Content: Recombinant DNA technology; carbohydrate metabolism; lipid metabolism; respiration and energy metabolism; nitrogen metabolism.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can demonstrate detailed knowledge of metabolic pathways in cells.	
LO-2	Can conduct detailed research on cellular metabolic pathways.	
LO-3	Can explain cellular metabolic pathways and their importance.	
LO-4	Can discuss cellular metabolic pathways and their significance.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Recombinant DNA: Restriction enzymes, nucleic acid hybridization	
2	Recombinant DNA: DNA cloning	
3	Recombinant DNA: DNA sequencing, polymerase chain reaction (PCR)	
4	Carbohydrate metabolism: Mono-, di-, and polysaccharides	
5	Carbohydrate metabolism: Glycolysis, pentose phosphate pathway	
6	Carbohydrate metabolism: Glycogen metabolism	
7	Lipid metabolism: Structure and function of fatty acids	
8	Lipid metabolism: Fatty acid degradation and synthesis	
9	MIDTERM EXAM	
10	Lipid metabolism: Cholesterol and lipoproteins	
11	Respiration and energy: Citric acid cycle, electron transport system	
12	Respiration and energy: Photosynthesis	
13	Nitrogen metabolism: Nitrogen assimilation	
14	Nitrogen metabolism: Amino acid metabolism	
15	Nitrogen metabolism: Heme and chlorophyll	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2006	
Course Title	General Microbiology	
Course Objective/Content	<p>Course Objective: To provide students with the course content in the most effective way using up-to-date methods and knowledge.</p> <p>Course Content: Introduction to microbiology; chemical structure of microbial cells; basic methods in microbiology; microbial cell structure; microbial nutrition and energy metabolism; microbial genetics; genetic engineering and biotechnology; microbial classification and diversity; interactions of microorganisms with humans and their importance; antibiotics and chemotherapy; microorganism–human interactions and immunity; clinical microbiology; interactions of microorganisms in the environment and their significance.</p>	
Course Hours	3	
ECTS Credits	5	
Learning Outcomes		
LO-1	Can demonstrate detailed knowledge of the characteristics of prokaryotic cells and viruses.	
LO-2	Can demonstrate knowledge of bacterial classification.	
LO-3	Can demonstrate knowledge of the applications of bacteria in biotechnology and genetic engineering.	
LO-4	Can demonstrate knowledge of microorganism–human–environment interactions.	
LO-5	Can demonstrate knowledge of current topics in microbiology.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to microbiology	
2	Chemical structure of microbial cells	
3	Basic methods in microbiology	
4	Microbial cell	
5	Microbial nutrition and energy metabolism	
6	Microbial genetics	
7	Genetic engineering and biotechnology	
8	Microbial classification and diversity	
9	Midterm Exam I	
10	Interactions of microorganisms with humans and their importance	
11	Antibiotics and chemotherapy	
12	Midterm Exam II	
13	Microorganism–human interactions and immunity	
14	Clinical microbiology	
15	Interactions of microorganisms in the environment and their importance	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2010	
Course Title	Animal Histology Laboratory	
Course Objective/Content	<p>Course Objective: To teach students the basic tissue types, to introduce the histological structures of specific organs, to enable understanding of similarities and differences among tissue types, and to familiarize students with microscopic specimens of fundamental tissues and organs.</p> <p>Course Content: Introduction to histology; histological techniques; classification of epithelial tissue; connective tissue (examination of loose and dense connective tissue); cartilage tissue; bone tissue (examination of endochondral and intramembranous ossification); blood tissue; muscle tissue (examination of smooth and striated muscle); nervous tissue (examination of myelinated and unmyelinated nerve cells).</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Can define the similarities and differences among basic tissue types.	
LO-2	Can identify specimens of different tissues on microscopic slides.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to basic histology laboratory and histological techniques	
2	Examination of different epithelial tissue samples	
3	Examination of glandular epithelium	
4	Examination of connective tissue samples	
5	Examination of different blood cell types	
6	Examination of different cartilage tissue samples: hyaline, elastic, and fibrocartilage	
7	Examination of bone tissue and different types of bone formation (endochondral and intramembranous ossification)	
8	Examination of different muscle types: striated muscle	
9	MIDTERM EXAM	
10	Examination of smooth muscle and cardiac muscle samples	
11	Examination of nerve cells	
12	Examination of nerve cells	
13	Examination of different human cell types	
14	Presentation of a laboratory study	
15	Examination of cell types in different animal samples	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2012	
Course Title	General Microbiology Laboratory	
Course Objective/Content	<p>Course Objective: To gain practical experience in microbiology laboratory techniques.</p> <p>Course Content: Introduction to microbiology laboratory environments and safety rules; preparation of bacterial culture media and sterilization techniques; aseptic transfer of microorganisms and culture methods; demonstration of the ubiquity of microorganisms; determination of the antimicrobial effects of various physical and chemical factors; microscopic examination of microorganisms and their structures; selective and differential media and biochemical enzyme activities of microorganisms; identification of bacterial species; determination of the bacterial growth curve; microbial analysis of various food, water, and soil samples; microbe-host interactions; cultivation and isolation of bacteriophages; determination of genetic characteristics of microorganisms; serological methods used in the identification of microorganisms.</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Can demonstrate detailed knowledge of the characteristics of prokaryotic cells and viruses.	
LO-2	Can gain practical experience in microbiology laboratory techniques.	
LO-3	Can participate in discussions with peers on microbiology laboratory experiences.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to microbiology laboratory environment and safety rules	
2	Preparation of bacterial culture media and sterilization techniques	
3	Aseptic transfer of microorganisms and culture methods	
4	Demonstration of the ubiquity of microorganisms	
5	Determination of the antimicrobial effects of various physical and chemical factors	
6	Microscopic examination of microorganisms and their structures	
7	Selective and differential media and biochemical enzyme activities of microorganisms	
8	Identification of bacterial species	
9	MIDTERM EXAM	
10	Determination of the bacterial growth curve	
11	Microbial analysis of various food, water, and soil samples	
12	Microbe–host interactions	
13	Cultivation and isolation of bacteriophages	
14	Determination of genetic characteristics of microorganisms	
15	Serological methods used in the identification of microorganisms	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Devam/Katılım	-	-
Laboratuvar	-	-
Küçük Sınav	-	-
Ödev	-	-
Ara Sınav	1	%50
Final	1	%50



Course Code	BIY2014	
Course Title	Cell Biochemistry Laboratory	
Course Objective/Content	<p>Course Objective: To provide knowledge on the preparation of solutions and the use of methods and laboratory equipment employed in the qualitative and quantitative analysis of biomolecules.</p> <p>Course Content: General rules; materials used in the laboratory; chemicals used in the laboratory; preparation of solutions and concentration units; percentage solutions; molar solutions; ppm solutions; solution dilution; acids and bases; buffer solutions; titration; acid–base titration; amino acid titration; thin-layer chromatography; spectrophotometer and calibration curve; quantitative protein determination and the Bradford method; precipitation reactions of amino acids and protein precipitation; qualitative determination of carbohydrates; saponification reactions and soap production; protein purification techniques; ion-exchange column chromatography; isolation of soluble cellular proteins; structure, classification, and activity measurement of enzymes and unit calculations; free fatty acid value determination.</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Can learn solution preparation and concentration units.	
LO-2	Can demonstrate knowledge of basic qualitative and quantitative analysis methods of biomolecules.	
LO-3	Can demonstrate knowledge of the use of basic instruments in a biochemistry laboratory.	
LO-4	Can evaluate qualitative and quantitative analysis data.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to the biochemistry laboratory; laboratory rules, materials, and chemicals	
2	Preparation of solutions and concentration units; percentage, molar, and ppm solutions; solution dilution	
3	Acids and bases; buffer solutions	
4	Titration; acid–base titration; amino acid titration	
5	Thin-layer chromatography	
6	Spectrophotometry and calibration curve	
7	Quantitative protein determination and the Bradford method	
8	Precipitation reactions of amino acids and protein precipitation	
9	MIDTERM EXAM	
10	Qualitative analysis of carbohydrates	
11	Saponification reactions and soap production	
12	Protein purification techniques; ion-exchange column chromatography	
13	Isolation of soluble cellular proteins	
14	Structure, classification, and activity measurement of enzymes; unit calculations	
15	Lipids and free fatty acid value determination	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Devam/Katılım	-	-
Laboratuvar	-	-
Küçük Sınav	-	-



Ödev	-	-
Ara Sınav	1	50%
Final	1	50%



Course Code	BIY2018	
Course Title	Internship	
Course Objective/Content	<p>Course Objective: To provide students with information about the internship and to prepare them to take part in all procedures and processes during their internship period.</p> <p>Course Content: Professional ethics; awareness of duties and responsibilities; evaluation of institutions suitable for internship; planning of the workplace internship program; work discipline, teamwork, and interpersonal relations; quality and standardization in organizations.</p>	
Course Hours	2	
ECTS Credits	5	
Learning Outcomes		
LO-1	Can apply theoretical knowledge acquired in the educational program to practice.	
LO-2	Can demonstrate awareness of professional ethics, responsibilities, and interpersonal relations.	
LO-3	Can develop an internship plan and prepare an internship report.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Determination of a suitable internship placement	
2	Determination of a suitable internship placement	
3	Knowledge of internship application procedures and required documents	
4	Preparation of an internship plan	
5	Evaluation of workplace employee relations	
6	Understanding workplace duties and responsibilities	
7	Understanding teamwork	
8	Evaluation of production processes in the workplace	
9	Learning the layout, auxiliary units, and process flow of the organization	
10	Learning quality and standardization practices in organizations	
11	Learning quality and standardization practices in organizations	
12	Cause-effect relationships in workplace practices	
13	Preparation of the internship report	
14	Preparation of the internship report	
15	Preparation of the internship report	
16	Presentation	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	-	-
Presentation	1	100%



Course Code	BIY2020	
Course Title	Vertebrate Animal Biology	
Course Objective/Content	<p>Course Objective: This course aims to provide students with knowledge about the classification, anatomy, and physiology of vertebrate animals, their survival strategies, ecological roles, and economic importance.</p> <p>Course Content: Chordates; jawless vertebrates; cartilaginous and bony fishes; amphibians and reptiles; birds and mammals. The anatomy, ecology, roles, and trophic interactions of these animals; economically important species and their utilization.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can understand the diversity and roles of vertebrate animals.	
LO-2	Can identify the systematics of any vertebrate animal in their environment and demonstrate its role in the ecosystem.	
LO-3	Can demonstrate knowledge of different techniques used to study vertebrate animals.	
LO-4	Can collect vertebrate animals from natural environments.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	General introduction to systematics and nomenclature	
2	Systematics, anatomy, and ecological roles of primitive vertebrates	
3	Systematics, anatomy, and ecological roles of jawless vertebrates	
4	Systematics, anatomy, and ecological roles of cartilaginous fishes	
5	Systematics, anatomy, and ecological roles of bony fishes	
6	Systematics, anatomy, and ecological roles of amphibians (frogs)	
7	Systematics, anatomy, and ecological roles of reptiles (turtles)	
8	Systematics, anatomy, and ecological roles of reptiles (lizards and snakes)	
9	MIDTERM EXAM	
10	General characteristics of birds and systematics, anatomy, and ecological roles of penguins	
11	Systematics, anatomy, and ecological roles of other birds	
12	Systematics, anatomy, and ecological roles of primitive mammals	
13	Systematics, anatomy, and ecological roles of placental mammals	
14	Systematics, anatomy, and ecological roles of primates	
15	Technical field trip	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY2022	
Course Title	Animal Histology	
Course Objective/Content	<p>Course Objective: To teach students the basic tissue types and organ systems, to provide an understanding of histogenesis from the cell to the formation of organs, to explain the structural and functional relationships between the tissues and cells that constitute organs, and to enable understanding of the similarities and differences among tissue types.</p> <p>Course Content: Introduction to histology; definition and types of tissues; epithelial tissue; connective tissue; blood tissue; cartilage tissue; bone tissue; muscle tissue; and nervous tissue, including their structure and function.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can understand histological terminology.	
LO-2	Can define the structural and functional relationships between the tissues and cells that constitute each organ.	
LO-3	Can define the similarities and differences among basic tissue types.	
LO-4	Can explain the functions of cells and organelles at the molecular, biochemical, and physiological levels in relation to their specific structures.	
LO-5	Can define the structural and functional relationships of animal organ systems such as circulatory, digestive, endocrine, and reproductive systems.	
LO-6	Can identify specimens of different tissues on microscopic slides.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to histology; cell structure and morphology; classification of tissues	
2	Epithelial tissue; origin, distribution, functions, and general characteristics; covering epithelium; sensory epithelium	
3	Glands; endocrine glands; classification of hormones	
4	Supporting tissues; connective tissue	
5	Types of connective tissue; adipose tissue	
6	Blood tissue	
7	Lymph and other components of blood	
8	Cartilage tissue	
9	MIDTERM EXAM	
10	Bone tissue	
11	Muscle tissue	
12	Muscle tissue	
13	Nervous tissue	
14	Relationships between nerves and synapses	
15	Example tissues in different animals and their functions	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-



Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY3005
Course Title	Genetics I
Course Objective/Content	<p>Course Objective: To teach students the fundamental concepts of genetics and to establish a solid foundation in classical Mendelian genetics. Upon successful completion of this course, students are expected to gain knowledge of Mendel's fundamental laws and the contributions of modern genetics to this field, and to be equipped with the necessary background to understand more advanced topics in genetics. In addition, the course aims to develop students' problem-solving and analytical thinking skills and to provide insight into how geneticists solve problems and make new discoveries.</p> <p>Course Content: History of genetics; basic concepts and inheritance patterns; experimental organisms and variation; chromosomal basis of inheritance and chromosome organization; gene interactions; statistical analysis; gene transfer in organisms; linkage, recombination, and chromosome mapping; tissue compatibility and self-incompatibility; quantitative inheritance and phenotypic expression.</p>
Course Hours	3
ECTS Credits	4
Learning Outcomes	
LO-1	Can understand Mendel's first and second laws and their relationship with cytogenetics.
LO-2	Can determine the outcomes of genetic crosses using Punnett squares.
LO-3	Can apply the chi-square test to the results of genetic crosses.
LO-4	Can design and explain an experiment to determine genotypes using test crosses.
LO-5	Can compare incomplete dominance and codominance and predict their modes of inheritance.
LO-6	Can define and explain multiple alleles, multiple loci, and pleiotropy.
LO-7	Can construct pedigrees to explain the inheritance of a single gene and interpret relationships within them.
LO-8	Can construct genetic maps.
LO-9	Can solve problems in quantitative genetics.
COURSE SCHEDULE	
WEEKS	TOPICS
1	History of genetics
2	Experimental organisms used in genetics
3	Monohybrid cross
4	Chromosomes and cell division
5	Dihybrid cross and deviations from Mendelian ratios
6	Dihybrid cross and deviations from Mendelian ratios
7	Statistical analysis in genetics
8	Gene linkage
9	MIDTERM EXAM
10	Gene linkage
11	Gene linkage
12	Multiple alleles
13	Polygenic inheritance
14	Polygenic inheritance
15	Polygenic inheritance
16	FINAL EXAM



ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY3009	
Course Title	Animal Physiology Laboratory	
Course Objective/Content	<p>Course Objective: To understand the fundamental principles and mechanisms of all animal systems from a physiological perspective, and to be able to document the methods and results of each laboratory application and organize laboratory data.</p> <p>Course Content: Introduction to animal physiology; digestion of macronutrients (carbohydrates, lipids, and proteins); digestive systems in different animals; gas exchange; respiratory systems in different animals; circulatory systems in different animals; blood pressure measurement; excretory systems in different animals; responses to neural stimuli.</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Can explain the functions of systems at the molecular, biochemical, and physiological levels in relation to their specific structures.	
LO-2	Can conduct basic experimental studies on physiological processes.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to animal physiology laboratory; physiological techniques	
2	Digestion of basic nutrient molecules	
3	Examination of digestive organs in different animals: annelids, insects, and fish	
4	Examination of respiratory organs in different animals: tracheal system in insects, gills in fish, and mammalian lungs	
5	Detection of gases such as oxygen and carbon dioxide in different environments	
6	Examination of hearts in different animals	
7	Blood pressure measurement	
8	Examination of excretory organs in different animals	
9	MIDTERM EXAM	
10	Observation of the effects of hormones in animals	
11	Examination of nervous systems in different animals	
12	Examination of nervous systems in different animals	
13	Reflex mechanism	
14	Special behaviors in animals	
15	Presentation of a laboratory study	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY3011	
Course Title	Animal Physiology	
Course Objective/Content	<p>Course Objective: To provide a comprehensive overview of animal physiology from a comparative perspective; to examine animal organ systems and their control mechanisms (nervous and endocrine systems), emphasizing how these systems have evolved and enable organisms to survive in diverse ecological environments; and to understand the fundamental principles and mechanisms of all animal systems from a physiological perspective.</p> <p>Course Content: Introduction to animal physiology; sensory organs and nervous system in animals; respiratory system; circulatory system; digestive system; excretory system; muscular system; skeletal system; endocrine system and reproductive system physiology.</p>	
Course Hours	3	
ECTS Credits	3	
Learning Outcomes		
LO-1	Can explain the adaptation of animals to environmental conditions.	
LO-2	Can define the basic concepts of substance transport in the cell.	
LO-3	Can define the roles and functions of lipids, carbohydrates, and proteins as metabolic products.	
LO-4	Can explain the functions of systems at the molecular, biochemical, and physiological levels in relation to their specific structures.	
LO-5	Can define the structural and functional relationships of the nervous and endocrine systems in controlling other systems of living organisms.	
ÖK-6	Can conduct basic experimental studies on physiological processes.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to physiology	
2	Nervous system in animals and humans	
3	Brain organization in animals and humans	
4	Sensory organs (touch, taste, and olfaction in animals)	
5	Respiratory system	
6	Circulatory system	
7	Circulatory system	
8	Circulatory system	
9	Midterm Exam	
10	Excretory system	
11	Muscular system and physiology of muscle contraction in animals	
12	Types of movement in animals	
13	Skeletal system in animals	
14	Skeletal system in animals	
15	Reproductive system and types of reproduction in animals	
16	Final Exam	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-



Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY3017	
Course Title	Biology of Seedless Plants Laboratory	
Course Objective/Content	<p>Course Objective: To enable students to learn all groups of seedless (spore-producing) plants, from the simplest forms to the most advanced.</p> <p>Course Content: Study of all groups of seedless (spore-producing) plants, from the simplest forms to the most advanced. In parallel with the theoretical topics, plant samples collected from various environments are brought to the laboratory and examined by students under a microscope or stereomicroscope (dissecting microscope), and identified to facilitate recognition of plant groups.</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Can understand the morphological differences among seedless plants.	
LO-2	Can gain skills in examining a water sample containing various microorganisms in the laboratory.	
LO-3	Can develop the ability to draw the specimens they examine in the laboratory.	
LO-4	Can use identification keys to determine unknown plant species and access detailed information about them.	
WEEKS	TOPICS	
1	Introduction. Bacteriophyta (Bacteria): Micrococcus, Diplococcus, Streptococcus, Lactobacillus	
2	Cyanophyta (blue-green algae): Chroococcus, Gloeocapsa, Oscillatoria, Nostoc	
3	Euglenophyta: Euglena; Pyrrophyta: Ceratium; Bacillariophyta: Coscinodiscus, Navicula, Bacillaria	
4	Chlorophyta (green algae): Pediastrum, Scenedesmus, Ulothrix, Ulva, Enteromorpha	
5	Chlorophyta (green algae): Cladophora, Acetabularia, Codium, Closterium, Spirogyra; Chara	
6	Phaeophyta: Padina, Dictyota, Fucus, Cystoseira, Sargassum; Rhodophyta: Ceramium, Porphyra	
7	Mycophyta (Fungi): Myxomycetes: Stemonitis, Tricha, Comatricha; Zygomycetes: Mucor	
8	Mycophyta (Fungi): Ascomycetes: Saccharomyces, Aspergillus, Penicillium, Peziza, Morchella	
9	MIDTERM EXAM	
10	Mycophyta (Fungi): Basidiomycetes: Puccinia, Ustilago, Agaricus, Fomes	
11	Lichenes (lichens): Parmelia, Cladonia, Xanthoria, Usnea, Evernia etc.	
12	Bryophyta: Hepaticae: Marchantia; Musci: Sphagnum, Polytrichum	
13	Pteridophyta: Lycopodium, Selaginella, Equisetum	
14	Pteridophyta (ferns): Filicatae: Polypodium, Phyllitis, Adiantum, Polystichum	
15	Pteridophyta (ferns): Filicatae: Asplenium, Osmunda, Salvinia, Azolla	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	BIY3019
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Course Title	Biology of Seedless Plants	
Course Objective/Content	Course Objective:To recognize seedless plants and to understand their biological structures. Course Content:Nomenclature and classification systems in plants; general characteristics of Cyanophyta; Chlorophyta; Phycophyta; Mycophyta; Lichenes; Bryophyta; and Pteridophyta; and the biological structures of important taxa within these divisions.	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can recognize seedless plants and understand their structure and function.	
LO-2	Can understand the life cycles of important taxa.	
LO-3	Can analyze the interactions of plants with their environment.	
LO-4	Can distinguish the fundamental differences among living groups.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Nomenclature and classification systems in plants; general characteristics of Cyanophyta and biology of selected examples	
2	General characteristics of Chlorophyta and biology of important taxa	
3	General characteristics of Phycophyta (Euglenophyta, Pyrrophyceae, and Chrysophyceae) and biology of important taxa	
4	General characteristics of Phycophyta (Xanthophyceae, Chlorophyceae, Charophyceae) and biology of important taxa	
5	General characteristics of Phycophyta (Phaeophyceae and Rhodophyceae) and biology of important taxa	
6	General characteristics of Mycophyta (Myxomycetes and Phycomycetes) and biology of important taxa	
7	General characteristics of Mycophyta (Ascomycetes) and biology of important taxa	
8	General characteristics of Mycophyta (Basidiomycetes and Deuteromycetes) and biology of important taxa	
9	MIDTERM EXAM	
10	General characteristics of lichens and biology of important taxa	
11	General characteristics of Bryophyta (Marchantiopsida and Anthocerotophyta) and biology of important taxa	
12	General characteristics of Bryophyta (Bryopsida) and biology of important taxa	
13	General characteristics of Pteridophyta (Lycopodiinae) and biology of important taxa	
14	General characteristics of Pteridophyta (Equisetinae and Filicinae) and biology of important taxa	
15	General similarities and differences between seedless and seed plants	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	-	-
Final Exam	1	50%
Quiz	1	50%

Course Code	BIY3027
Course Title	Ecology



Course Objective/Content	Course Objective:To introduce the general principles of ecology and to explain the functioning mechanisms and purposes of ecosystems, including matter cycles, energy flow, and population regulation. Course Content:Definitions; sub-disciplines of ecology and related fields; ecosystem, habitat, and ecological niche; ecological cycles; population ecology and interspecific relationships; the biosphere and its characteristics; environmental factors such as water, light, temperature, humidity, pressure, and edaphic factors; terrestrial, freshwater, and marine ecosystems and their characteristics; biodiversity, conservation biology, and ethics.	
Course Hours	3	
ECTS Credits	3	
Learning Outcomes		
LO-1	Can define the characteristics of ecosystems and represent them schematically.	
LO-2	Can explain the importance of ecological cycles.	
LO-3	Can respond to questions related to ecological problems.	
LO-4	Can understand and define ecological terminology.	
LO-5	Can explain the effects of environmental pollution on living organisms and apply ethical principles.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Scope, definition, and historical development of ecology; branches of ecology; relationships between ecology, economy, and ethics; ecological sustainability	
2	Basic concepts used in ecology	
3	Structure and functions of ecosystems	
4	Terrestrial ecosystems	
5	Aquatic ecosystems	
6	Population ecology	
7	Ecological cycles	
8	Food chains and energy pyramids	
9	MIDTERM EXAM	
10	Ecological relationships	
11	Biodiversity, conservation of biodiversity, conservation ethics, and biosafety applications for conservation	
12	Environmental pollution and environmental ethics	
13	Statistical approaches in ecology; analysis of ecological data using SPSS; graphical presentation using Microsoft PowerPoint	
14	Student presentations (seminars) using Microsoft PowerPoint: Current topics in ecology I	
15	Student presentations (seminars) using Microsoft PowerPoint: Current topics in ecology II	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%
Course Code	BIY3003	
Course Title	Food Microbiology	



Course Objective/Content	Course Objective: The aim of this course is to help students understand foodborne pathogens and the methods used to control them. Course Content: Introduction to food microbiology; microbial spoilage; foodborne pathogenic bacteria; mycotoxigenic molds; viruses; foodborne and waterborne parasites; preservation and conservation methods; food fermentations; advanced techniques used in food microbiology.	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can demonstrate knowledge of foodborne pathogenic bacteria, mycotoxigenic molds, viruses, and parasites.	
LO-2	Can explain preservatives used in foods and methods of food preservation.	
LO-3	Can explain advanced techniques used in food microbiology and food fermentations.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Microorganism-food relationships	
2	Important microorganisms in foods	
3	Sources of microbial contamination	
4	Factors affecting microbial growth in foods	
5	Indicator microorganisms in foods	
6	Foodborne microbial diseases	
7	General principles: prevention of contamination and removal of microorganisms	
8	Inhibition of microbial growth	
9	MIDTERM EXAM	
10	Destruction of microorganisms	
11	Student seminar	
12	Student seminar	
13	Student seminar	
14	Technical field trip to food industry companies	
15	Food safety and microbial criteria	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY3007	
Course Title	Hydrobiology	
Course Objective/Content	<p>Course Objective: To introduce freshwater and marine environments and their characteristics; to explain life in aquatic systems; and to examine the effects of physicochemical parameters such as pH, oxygen, temperature, and salinity on living organisms.</p> <p>Course Content: Vertebrates, invertebrates, and plants in aquatic environments; physicochemical properties of water affecting living organisms, such as pH, salinity, oxygen, and pressure; and the effects of water on living organisms.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can describe research methods and basic concepts in hydrobiology.	
LO-2	Can describe and classify aquatic environments based on their characteristics.	
LO-3	Can explain the benthic and pelagic zones, including their features, fauna, and flora.	
LO-4	Can explain the importance of aquatic environments for humans and the benefits of aquatic organisms.	
LO-5	Can define brackish and hypersaline waters and describe the organisms found in them.	
LO-6	Can explain the formation and cycling of organic matter in aquatic systems.	
LO-7	Can conduct sampling studies in hydrobiology and present the results.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Research methods in hydrobiology	
2	Classification of aquatic environments based on their properties	
3	Classification of aquatic environments based on their properties	
4	Ecological factors in aquatic environments and their effects on organisms	
5	Ecological factors in aquatic environments and their effects on organisms	
6	Communities and characteristics of the pelagic zone	
7	Communities and characteristics of the pelagic zone	
8	Communities and characteristics of the pelagic zone	
9	MIDTERM EXAM	
10	Brackish waters and their organisms	
11	Brackish waters and their organisms	
12	Hypersaline waters and their organisms	
13	Hypersaline waters and their organisms	
14	Formation and cycling of organic matter in aquatic environments	
15	Biogeography of aquatic environments	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY3015	
Course Title	Endocrinology	
Course Objective/Content	<p>Course Objective: To provide an understanding of hormones and their mechanisms of action in both invertebrate and vertebrate organisms.</p> <p>Course Content: Hormonal communication and endocrine glands; pituitary gland; neurohypophysis; thyroid gland; parathyroid gland; calcium homeostasis and hormone functions; endocrine functions of the pancreas; insulin; glucagon and glucose homeostasis; adrenal gland; sex hormones; hormones related to pregnancy, birth, and lactation.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can summarize the principles of hormone biosynthesis, secretion, and mechanisms of action.	
LO-2	Can comparatively explain the endocrine system in invertebrates.	
LO-3	Can summarize the hormones of the pituitary gland and their functions.	
LO-4	Can define the effects of hormones produced by the thyroid, parathyroid, pineal, thymus, pancreas, adrenal glands, gonads, and gastrointestinal system.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to endocrinology	
2	Characteristics and classification of hormones	
3	Hormone synthesis, secretion, and mechanisms of action	
4	Types of chemical messengers in organisms; methods used in endocrinology	
5	Endocrine system in invertebrates	
6	Endocrine system in invertebrates	
7	Thyroid gland	
8	Parathyroid gland	
9	MIDTERM EXAM	
10	Pineal gland	
11	Thymus gland	
12	Pancreas and its hormones	
13	Gastrointestinal hormones	
14	Histology of the adrenal gland and its hormones	
15	Gonadal hormones	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	%20
Midterm Exam	1	%30
Final Exam	1	%50



Course Code	BIY3023	
Course Title	Plant Embryology	
Course Objective/Content	Course Objective: To introduce the plant embryo and to explain the stages of embryo development. Course Content: Introduction; development of microsporangium and megasporangium in gymnosperms and angiosperms; fertilization and embryo development; development of male and female gametophytes.	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can understand embryo formation in plants.	
LO-2	Can identify embryonic structures.	
LO-3	Can understand abnormalities in fertilization.	
LO-4	Can understand apomixis observed in certain plant groups.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Flower structure in angiosperms	
2	Structure and development of the microsporangium	
3	Structure and development of the microsporangium	
4	Microsporogenesis	
5	Male gametophyte	
6	Structure and development of the megasporangium	
7	Structure and development of the megasporangium	
8	Megasporogenesis	
9	MIDTERM EXAM	
10	Female gametophyte	
11	Pollination and fertilization	
12	Seminar	
13	Seminar	
14	Endosperm development	
15	Embryo development	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY3021
Course Title	Entomology
Course Objective/Content	Course Objective: To deliver the course content to students in the most effective way using up-to-date methods and knowledge. Course Content: Identification of insects; external morphology; respiration, digestion, and sensory organs; egg types and fertilization; collection and preparation of insects; methods of insect control (mechanical, chemical, and biological); insects used in biological control; diseases caused by insects; classification of insects.
Course Hours	3
ECTS Credits	4
Learning Outcomes	
LO-1	Can understand entomological terminology.
LO-2	Can distinguish insects from other animals and arthropods.
LO-3	Can explain insect morphology and life cycles.
LO-4	Can explain the effects and importance of insects (beneficial and harmful) on the environment and humans.
LO-5	Can define the structural and functional relationships of the nervous and endocrine systems in controlling other systems of living organisms.
LO-6	Can explain methods of insect control.
COURSE SCHEDULE	
WEEKS	TOPICS
1	Introduction and basic concepts; definition and history of entomology; general characteristics of insects
2	Insect morphology I: external structure; head structure and appendages; antennae and mouthparts
3	Insect morphology II: body structure and segmentation; wings and legs; abdomen and appendages
4	Insect physiology I: digestive system; respiratory system; circulatory system
5	Insect physiology II: nervous system; sensory organs; reproductive system
6	Insect development and metamorphosis: egg, larva, pupa, and adult stages; ametabolous, hemimetabolous, and holometabolous metamorphosis
7	Insect ecology: relationships with the environment; habitat selection and adaptations; feeding habits
8	Insect behavior: communication and social behaviors; predation and defense mechanisms; reproductive behaviors
9	MIDTERM EXAM
10	Insects and humans: agriculture and insects; insects and human health; economic importance of insects
11	Insect pests and control methods: definition and importance of pests; chemical, biological, and cultural control methods; integrated pest management (IPM)
12	Insect collections and identification: collection and preservation techniques; identification and classification; importance of collections
13	Molecular entomology: insect genetics and genomics; molecular techniques and applications; genetic modification in insects
14	Insect biodiversity and conservation: importance of insect diversity; conservation and sustainability; threatened species and conservation strategies
15	Current topics and research: recent developments in entomology; research projects and new discoveries; future perspectives and the importance of entomology
16	FINAL EXAM
ASSESSMENT METHODS AND GRADING	



Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY3001	
Course Title	Plant Nutrition	
Course Objective/Content	<p>Course Objective: The aim of this course is to teach students the contributions of macro- and micronutrients to plant physiology, biochemistry, and plant production.</p> <p>Course Content: Macro- and micronutrients in plants; transport mechanisms in plants; physiological and biochemical roles of elements in plants; photosynthesis; respiration; element cycles in ecosystems.</p>	
Course Hours	3	
ECTS Credits	4	
Learning Outcomes		
LO-1	Can conduct literature research.	
LO-2	Can perform topic-focused research.	
LO-3	Can reinforce decision-making skills and apply engineering principles.	
LO-4	Can report the results of analyses and investigations.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Overview of the plant cell	
2	Macroelements	
3	Microelements	
4	Intracellular transport mechanisms	
5	Intercellular transport	
6	Physiological roles of nutrient elements	
7	Photosynthesis	
8	Respiration	
9	MIDTERM EXAM	
10	Nitrogen assimilation	
11	Element cycles	
12	Element cycles	
13	Plant production	
14	Plant production	
15	Phytoremediation	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	USEC001/2	
Course Title	History of Science	
Course Objective/Content	<p>Course Objective: To present examples of civilizations that contributed to science throughout history and to explain the factors that caused science to decline and shift along the East-West axis.</p> <p>Course Content: Fundamental concepts, science in Ancient Egypt, Mesopotamia, India, and China, science in the Ancient Greek world, science in Rome and the transition to the Middle Ages, science in the medieval Christian world, science among the Turks. The revival of science in Europe: science during the 12th-century Renaissance, the transition to modern science, the Renaissance, the Reformation, and the Enlightenment, the impact of the Industrial Revolution and the French Revolution on scientific developments. Leading scientists of the modern era.</p>	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC003/4	
Course Title	Professional Ethics	
Course Objective/Content	<p>Course Objective: To instill ethical awareness in students and to provide them with information on questioning, evaluating, and resolving ethical issues encountered in professional activities.</p> <p>Course Content: Concepts of ethics and morality, ethical theories, professional ethics, principles of professional ethics for different professions, ethics of scientific research and publication, ethical inquiries.</p>	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	USEC005/6	
Course Title	General Sociology	
Course Objective/Content	<p>Course Objective: The aim of this course is to teach students the fundamental concepts, basic theories, and research methods of Sociology.</p> <p>Course Content: Definition, subject matter, purpose, boundaries, and place of sociology within the social sciences; a general and brief overview of the development of social thought before the emergence of sociology as a science; the birth and development of sociology as a science; the fundamental views of some sociologists who pioneered the birth of sociology; the birth and development of sociology in Turkey: general information about methodology in sociology; examination of the concepts of group, social status, social role, social structure, and social relations; determinism and factors influencing social relations.</p>	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC007/8	
Course Title	Protection of Personal Data	
Course Objective/Content	<p>Course Objective: This course teaches individuals what constitutes personal data, what rights they have regarding this data, under what conditions their data may be processed, and what remedies they can use to defend themselves against attacks on their personal data.</p> <p>Course Content: The concept of personal data. The right to request the protection of personal data. Processing of personal data. Conditions for processing personal data. Special categories of personal data. Deletion, destruction, or anonymization of personal data. The concept of data controller. The data controller's obligation to inform. Data subjects and their rights. Obligations regarding data security. Applications, complaints, and the data controllers' registry. Crimes and misdemeanors. The Personal Data Protection Authority. Precedent decisions.</p>	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC009/10
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Course Title	Project Management	
Course Objective/Content	<p>Course Objective : To introduce grant mechanisms and grant-providing institutions, the concept of co-financing, and the preparation of projects to be submitted to grant sources using a logical framework approach and a project and program-oriented approach.</p> <p>Course Content : Project and program concepts, introduction to organizations and support mechanisms providing project support such as Development Agencies, KOSGEB, TÜBİTAK, framework programs, etc., originality analysis of projects, spatial factors, risk analyses, priority area analysis, NACE Codes, introduction to the professional consulting sector, emerging new trends, discussion of the concept of sustainability, project cycle management and the logical framework approach in this context, the concept of grants, support agreement, analysis and planning stages, current situation analysis, stakeholder analysis, problem analysis, target analysis, strategy analysis, duration-activity and resource planning, SWOT analysis, filling out the logical framework matrix, project budget, main and sub-costs, eligible and ineligible costs, resource planning, the concept of sustainability, the concept of multiplier effect, the concept of ultimate beneficiaries, performance indicators, project monitoring, procurement mechanisms, grant sources.</p>	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC0011/12	
Course Title	Career Planning	
Course Objective/Content	<p>Course Objective: The Career Planning course aims to familiarize students with the business world, different sectors, and their requirements, thereby raising awareness among students about the importance of career planning in preparing for the business world. The course helps students discover their personal competencies and accurately understand the expectations of the business world, enabling them to develop their knowledge and skills in line with the requirements of the relevant sectors.</p> <p>Course Content: Courses should be taught by university faculty members, industry professionals, and guest lecturers invited from other universities and relevant non-governmental organizations, in a manner appropriate to the topics and course content. Supporting activities included in the course should be designed to inform students about the methods and tools used in professional applications and to equip them with the skills to use them most effectively, and should be supported by practical assignments. Career centers should support the course practically by offering activities that provide experiential opportunities to help students develop their skills.</p>	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)



Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC0013/14
Course Title	Technology Addiction
Course Objective/Content	<p>Course Objective: To enable students to understand the concept of addiction, to evaluate themselves in this regard, to strive to use technology effectively, to comprehend technological addictions and their harms, to understand the multifaceted negative impact of misuse on the individual, to develop the will to show positive behavioral change as prospective parents, to know themselves and to stay away from harmful habits.</p> <p>Course Content: What is technology addiction, what are its symptoms, what might be the causes? Who is at risk? How should we use technology? Misuse and negative effects. Technological Addictions: Internet and social media; phones and tablets; games; computers and television. Suggestions for overcoming it. How can we protect our children?</p>
Course Hours	2
ECTS Credits	4

ASSESSMENT METHODS AND GRADING

Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC0015/16
Course Title	Project Management
Course Objective/Content	<p>Purpose: Introduction of grant mechanisms and institutions that provide grants, the concept of co-financing, project and program-oriented preparation of projects to be submitted to grant resources with a logical framework approach</p> <p>Content: Project and program concepts, Development Agency-KOSGEB-TÜBİTAK, framework programs, etc., the introduction of organizations and support mechanisms that provide project support, originality analysis of projects, local factors, risk analysis, priority areas analysis, NACE Codes, introduction of the professional consultancy sector, new trends Discussion of the concept of sustainability, project cycle management and logical framework approach in this context, grant concept, support contract, analysis and planning stages, current situation analysis, stakeholder analysis, problem analysis, goal analysis, strategy analysis, time-activity and resource planning, SWOT analysis , filling the logical framework matrix, project budget, main and sub-costs, eligible and ineligible costs, resource planning, the concept of sustainability, the concept of multiplier effect, the concept of final beneficiaries,</p>



	performance indicators, project monitoring, procurement mechanisms, grant resources.	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC0017/18	
Course Title	Occupational Health and Safety	
Course Objective/Content	<p>Course Objective: The aim of this course is to provide students with comprehensive and scientific knowledge of all studies aimed at protecting individuals from hazards and health risks that may arise during the course of work, as well as improving the workplace environment.</p> <p>Course Content: The course covers the fundamental concepts, history, legal aspects, basic applications, occupational diseases and accidents, protective measures for occupational health and safety, and risk assessment of occupational health and safety. There are no prerequisites or co-requisites for this course. It aims to raise awareness regarding occupational health and safety.</p>	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC0019/24	
Course Title	Sports Branch Courses	
Course Objective/Content	<p>Course Objective: To enable students to learn and practice the rules of individual or team sports such as Volleyball, Basketball, Football, Table Tennis, Taekwondo, and Squash in their free time .</p> <p>Course Content: Depending on the chosen sport, the course includes the history of the sport, rules of the game, and its applications.</p>	



Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC0033/34	
Course Title	Certification, Accreditation and Quality	
Course Objective/Content	<p>Course Objective: To provide students with up-to-date information on Quality Systems and practices needed to standardize certification, accreditation, and quality practices in businesses, and to develop and disseminate a quality mindset.</p> <p>Course Content: Definition of total quality management (TQM), its historical development, key elements and pioneers, benefits of TQM and its applicability in the public sector, participation methods in TQM, quality circles and problem-solving methods. Models developed and currently applied in TQM, the EFQM Excellence Model and its application in Turkey. Total quality management and application examples in public and local administrations in Turkey.</p>	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC0035/36	
Course Title	Quality Literacy	
Course Objective/Content	<p>Course Objective: The aim of this course is to enable students to effectively use quality tools and digital media, to gain skills in accessing, analyzing, and researching digital content, and to produce their own digital content at a basic level.</p> <p>Course Content: The concept and scope of quality literacy. Quality culture, generations, and identities. Digital technologies, digital-based platforms, and quality. Access to and research of information today. Quality, privacy, security, and confidentiality in the digital age. Digital citizenship. Information on digital platforms: sharing, quality, and accuracy, verification tools and platforms. Digital content: types, reading, and analysis. Basic content creation on digital</p>	



	platforms.	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC0037/38	
Course Title	Volunteer Work	
Course Objective/Content	<p>Course Objective: To provide students with conceptual competence in civil society and volunteerism, and to equip them with strategic knowledge to be more effective as a civil society organization officer or volunteer. In addition, the aim is to provide information about developing civil society organizations in Turkey and around the world.</p> <p>Course Content: What is volunteering, and how is volunteer management implemented? Ethical and moral values in volunteer work. Volunteer work implemented in Turkey and around the world. Civil society organizations operating in Turkey and around the world. Preparing and implementing a project as part of daily activities. Sharing and evaluating the work carried out during the course.</p>	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

Course Code	USEC0039/40	
Course Title	Human Rights	
Course Objective/Content	<p>Course Objective: This course teaches individuals what their personal rights are and what avenues they can pursue to defend themselves against an attack on these rights.</p> <p>Course Content: The historical and intellectual development of human rights, fundamental concepts and principles of human rights law. Classification, integrity, and interdependence of human rights, the incorporation of human rights into positive law and their regulation within</p>	



	positive law. Limitations on fundamental rights and freedoms, protection of fundamental rights and freedoms in Turkey, protection of human rights within the United Nations system. Protection of human rights at the level of regional organizations, protection of human rights in Europe, and the fundamental characteristics of the European Convention on Human Rights (ECHR). Admissibility conditions for applications to the European Court of Human Rights (ECtHR), fundamental rights and freedoms guaranteed in the ECHR and its additional protocols. Expansion of the scope of protection of fundamental rights and freedoms within the framework of ECtHR judgments. Implementation of ECtHR judgments and the position of the ECHR in domestic law. Evaluation of current decisions of human rights protection mechanisms.	
Course Hours	2	
ECTS Credits	4	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY3000	
Course Title	Biology of Seed Plants Laboratory	
Course Objective/Content	<p>Course Objective: To study the systematics, structures, and major groups of seed plants.</p> <p>Course Content: Definition of characters used in plant identification; use of family identification keys; examination of selected gymnosperm samples; examination of selected angiosperm samples; technical field trip.</p>	
Course Hours	2	
ECTS Credits	2	
Learning Outcomes		
LO-1	Can distinguish the characters used in identification.	
LO-2	Can use identification keys.	
LO-3	Can describe plant parts.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to laboratory studies	
2	Learning diagnostic characters used in identification	
3	Use of family identification keys	
4	Examination of selected gymnosperm samples	
5	Examination of selected gymnosperm samples	
6	Vegetative characters of angiosperms	
7	Generative characters of angiosperms	
8	Identification of angiosperm specimens	
9	MIDTERM EXAM	
10	Identification of angiosperm specimens	
11	Identification of angiosperm specimens	
12	Identification of angiosperm specimens	
13	Identification of angiosperm specimens	
14	Identification of angiosperm specimens	
15	Technical field trip	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY3000	
Course Name	Seed Plants Biology Laboratory	
Course Subject/Content	<p>Course Aim; The systematics, structures, and study of major plant groups of seed plants worldwide.</p> <p>Course Content; Description of the characters used in plant identification. Use of family identification keys. Examination of some gymnosperm specimens. Examination of some angiosperm specimens. Technical field trip.</p>	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Can distinguish the characters used in plant identification.	
LO-2	Can use identification keys.	
LO-3	Can describe plant parts.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Explanations about laboratory work	
2	Learning the characters used in plant identification	
3	Using family identification keys	
4	Examination of some gymnosperm samples	
5	Examination of some gymnosperm samples	
6	Vegetative characteristics of angiosperms	
7	Generative characteristics of angiosperms	
8	Identification of angiosperm samples	
9	MIDTERM EXAM	
10	Identification of angiosperm samples	
11	Identification of angiosperm samples	
12	Identification of angiosperm samples	
13	Identification of angiosperm samples	
14	Identification of angiosperm samples	
15	Technical trip	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY3002	
Course Name	Seed Plants Biology	
Course Subject/Content	Course Aim; The systematics, structures, and study of major plant groups of seed plants worldwide. Course Content; Description of the characters used in plant identification. Use of family identification keys. Examination of some Gymnosperm specimens. Examination of some Angiosperm specimens. Technical field trip.	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can recognize major groups of seed plants.	
LO-2	Can distinguish diagnostic characters used in plant systematics.	
LO-3	Can identify plant specimens.	
LO-4	Can explain the importance of plants.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Botany and its importance	
2	Taxonomy and phylogeny	
3	Nomenclature rules in plants	
4	Characteristics of Spermatophyta and Gymnospermae	
5	Living Gymnospermae orders: Cycadales, Ginkgoales	
6	Living Gymnospermae orders: Coniferales, Gnetales	
7	Living Gymnospermae orders: Coniferales, Gnetales	
8	Generative characters of Angiosperms	
9	MIDTERM EXAM	
10	Some Dicotyledon families: Magnoliaceae, Nymphaeaceae, Ranunculaceae, Papaveraceae	
11	Some Dicotyledon families: Betulaceae, Caryophyllaceae, Malvaceae, Brassicaceae	
12	Some Dicotyledon families: Primulaceae, Rosaceae, Fabaceae, Rutaceae, Apiaceae	
13	Some Dicotyledon families: Solanaceae, Boraginaceae, Lamiaceae, Asteraceae	
14	Some Monocotyledon families: Aracaceae, Lemnaceae, Cyperaceae, Poaceae, Musaceae, Liliaceae, Iridaceae, Orchidaceae	
15	Technical trip	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY3006	
Course Name	Genetic - II	
Course Subject/Content	<p>Course Aim; The aim of this course is to equip students with sufficient knowledge in the topics of sex determination, sex-related inheritance, cytoplasmic inheritance, population genetics, evolutionary genetics, and molecular genetics. The ultimate goal for students who successfully complete this course is to enable them to solve problems, think analytically, understand the power of DNA technology, know the fundamental concepts of genetics and molecular biology, be sufficiently knowledgeable in all areas of genetics, and be able to comprehend more advanced topics in cell and molecular biology.</p> <p>Course Content; Sex determination, sex-linked and sex-influenced inheritance, chromosome structure and number changes and mutations, extranuclear genes, population genetics and evolution, genetics of development, immunogenetics, genetic engineering. 12 weeks of laboratory work on these topics.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can determine the sex of individuals with normal and abnormal chromosomal structures using appropriate methods.	
LO-2	Can identify sex-linked traits and their patterns of inheritance.	
LO-3	Can distinguish between sex-linked and sex-influenced traits.	
LO-4	Can identify variations in chromosome structure and number.	
LO-5	Can understand cytoplasmic inheritance and explain its differences from Mendelian inheritance.	
LO-6	Can analyze populations using the Hardy-Weinberg equation.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Phenotypic Expression	
2	Sex Determination	
3	Sex Determination	
4	Inheritance of Sex-Related Characteristics	
5	Inheritance of Sex-Related Characteristics	
6	Chromosome Number Alterations	
7	Chromosome Number Alterations	
8	Chromosome Structure Alterations	
9	MIDTERM EXAM	
10	Chromosome Number Alterations	
11	Cytoplasmic Inheritance	
12	Cytoplasmic Inheritance	
13	Population Genetics	
14	Population Genetics	
15	Recent Developments in Genetics	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%



Final Exam	1	50%
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Course Code	BIY3016	
Course Name	Plant Physiology Laboratory	
Course Subject/Content	<p>Course Aim; To enable the experimental demonstration of metabolic and growth processes occurring in plants.</p> <p>Course Content; Solution preparation, qualitative and quantitative determination of some substances found in plants, determination of osmotic potentials of plant tissues, permeability, transpiration, photosynthesis, respiration and fermentation experiments, experiments on the effects of plant hormones on growth and development.</p>	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Can gain experimental knowledge about the chemical composition of plants, plant–water relationships, and mineral transport.	
LO-2	Can gain observational knowledge about water loss (transpiration) in plants.	
LO-3	Can gain detailed experimental and observational knowledge about photosynthesis, respiration, and fermentation metabolism.	
LO-4	Can experimentally understand plant growth, development, and the hormonal regulation of these processes.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Laboratory General Rules and Solution Preparation	
2	Qualitative and Quantitative Determination of Certain Substances Found in Plants	
3	Determination of Osmotic Potentials of Plant Tissues	
4	Effect of Osmotic Potential on Germination	
5	Measurement of Membrane Permeability	
6	Observation of Water and Dissolved Substance Transport and Transpiration in Plants	
7	Extraction of Photosynthetic Pigments and Determination of Chlorophylls	
8	Separation of Photosynthetic Pigments by Chromatography and Starch Determination	
9	MIDTERM EXAM	
10	Observation of Respiration and Fermentation Events	
11	Determination of Ascorbic Acid Amount	
12	Observation of the Effect of Plant Growth Regulators on Growth	
13	Investigation of the Selective Herbicide Effect of 2,4-D	
14	Observation of Epinastin in Tomato Petioles	
15	Viability Test with Tetrazolium Test	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY3018	
Course Name	Bitki Fizyolojisi	
Course Subject/Content	<p>Course Aim; Increasing knowledge of plant metabolism aims to provide a better understanding of plant structure and physiology, as well as growth and development processes, and the impact of the environment on these processes.</p> <p>Course Content; Introduction to Plant Physiology, chemical composition of plant cells, water metabolism in plants, water uptake and transport in plants, mineral uptake and transport in plants, nitrogen metabolism and nutrient cycles, transport of organic matter in plants, water loss processes in plants, photosynthesis and chemosynthesis, respiration and fermentation, growth and development in plants, stress in plants.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can learn about the chemical composition of plants, plant–water relationships, and mineral transport.	
LO-2	Can learn about water loss and transport of organic substances in plants.	
LO-3	Can learn about nitrogen metabolism and nutrient cycles.	
LO-4	Can gain detailed knowledge of photosynthesis, respiration, and fermentation metabolism.	
LO-5	Can learn about plant growth, development, and the hormonal regulation of these processes.	
LO-6	Can learn about stress responses and signal transduction mechanisms in plants.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to Plant Physiology, Chemical Composition of Plant Cells, Water Metabolism	
2	Water Uptake and Transport in Plants	
3	Plant Nutrition, Uptake and Transport of Mineral Substances	
4	Nutrient Cycles, Nitrogen Fixation and Metabolism	
5	Organic Matter Transport	
6	Water Loss Events in Plants (Transpiration, Guttation and Exudation)	
7	Introduction to Photosynthesis, Electron Transport and Carbon Dioxide Fixation Reactions	
8	Effect of Environmental Factors on Photosynthesis, Photosynthesis in Bacteria, Chemosynthesis	
9	MIDTERM EXAM	
10	Respiration (Glycolysis, TCA cycle, Electron Transport System and ATP synthesis)	
11	Development, Differentiation and Growth in Plants, Abscission, Senescence, Apical Dominance, Dormancy, Light and Growth Events	
12	Development, Differentiation and Growth in Plants, Abscission, Senescence, Apical Dominance, Dormancy, Light and Growth Events	
13	Plant Hormones (Auxins, Cytokinins, Gibberellins, Absciscic Acid, Ethylene)	
14	Growth and Development Events Occurring in Plants from Seed to Fruit	
15	Movement in Plants (Tropism and Nasty)	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%



Final Exam	1	50%
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Course Code	BIY3022	
Course Name	Genetics Laboratory	
Course Subject/Content	<p>Course Aim; The aim of this course is to equip students with fundamental laboratory techniques related to classical and modern genetics, and to reinforce and consolidate what they have learned in Genetics I and II.</p> <p>Course Content; Drosophila (fruit fly) biology, reproduction and life cycle, polytene chromosomes in Drosophila, monohybrid and dihybrid crosses and statistical analysis with Drosophila, DNA polymorphism and fingerprint polymorphism in humans, molecular and chromosomal sex determination in humans, mitosis and meiosis in plants, karyotype analysis, current methods in genetics.</p>	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Can perform Drosophila crosses and interpret the results.	
LO-2	Can demonstrate knowledge of basic genetic laboratory safety rules.	
LO-3	Can understand and explain the use of modern genetic techniques.	
LO-4	Can develop critical thinking, scientific reasoning, and quantitative analysis skills in the design, analysis, and interpretation of genetic research.	
LO-5	Can understand the importance of genetic factors in health, disease, classification of living organisms, and life processes.	
LO-6	Can communicate laboratory results effectively in written and oral forms.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Biology, reproduction, and life cycle study of Drosophila (fruit fly)	
2	Polytene chromosomes in Drosophila	
3	Polytene chromosomes in Drosophila	
4	Polytene chromosomes in Drosophila	
5	Monohybrid and dihybrid crosses with Drosophila and statistical analysis of results	
6	Monohybrid and dihybrid crosses with Drosophila and statistical analysis of results	
7	Monohybrid and dihybrid crosses with Drosophila and statistical analysis of results	
8	DNA polymorphism in humans, study of the polymorphic D1S80 locus	
9	MIDTERM EXAM	
10	Chromosomal sex determination in humans, Barr body	
11	Molecular sex determination in humans, SRY gene	
12	Investigation of polygenic inheritance in humans, fingerprint counting	
13	Meiosis and mitosis in plants	
14	Karyotype analysis	
15	Review of current methods used in genetics	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY3004	
Course Name	Radiobiology	
Course Subject/Content	<p>Course Aim; Applications of ionizing radiation, its effects at the macromolecule, cellular, tissue, organ, and organism levels, and ways to protect against it.</p> <p>Course Content; Definition, subject and importance of radiobiology, terms and concepts related to radiobiology, radiation and its mechanism of action, types of radiation, modes of radiation absorption, radicals, forms of radiation, detectors, effects of radiation on biomolecules, cells, tissues, organs and humans, effects of radiation on cell cycle phases, radiation protection.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can define and explain what EMR and PR are.	
LO-2	Can explain the effects of EMR and PR on cells, tissues, and organs.	
LO-3	Can summarize the dangers and importance of radiation for humans.	
LO-4	Can summarize the types of radiation.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Basic definitions and concepts	
2	Ionizing radiation and absorption of radiation energy	
3	Distribution of radiation energy: LET and RBE	
4	Effects of radiation on nucleic acids and proteins	
5	Effects of radiation at the subcellular level	
6	Growth kinetics of cell populations	
7	Dividing cells and the concept of survival	
8	Susceptibility of different phases of the cell cycle to radiation	
9	MIDTERM EXAM	
10	Radicals	
11	Radiation damage and repair	
12	Radiosensitizers	
13	Radioprotectors	
14	Effects of radiation on tissues and organs	
15	Late effects of radiation: genetic changes and carcinogenic effects	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	15%
Midterm Exam	1	35%
Final Exam	1	50%



Course Code	BIY3010	
Course Name	Ichthyology Ichthyology	
Course Subject/Content	<p>Course Aim; In addition to teaching the morphological, anatomical, and physiological characteristics of fish, the course aims to identify some economically important freshwater and marine fish species. Topics such as exotic species and fish oils will also be covered.</p> <p>Course Content; The digestive, endocrine, and reproductive systems; some economically important freshwater and marine fish found in our country; exotic fish living in our inland waters; and fish oils constitute the content of this course.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can explain the importance of fish.	
LO-2	Can demonstrate knowledge of fish production methods and the status of fish farms in Türkiye.	
LO-3	Can describe fish anatomy.	
LO-4	Can understand the needs of fish and how these needs are met.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	The place of fish in the animal kingdom	
2	Evolution of fish and comparison with other vertebrates	
3	Classification of fish	
4	Classification of fish	
5	Morphological characteristics of fish	
6	Scales of fish	
7	Fins of fish	
8	Head and mouth structure in fish	
9	MIDTERM EXAM	
10	The skeleton in fish	
11	Respiration in fish	
12	Blood circulation and lymphatic system in fish	
13	Sight, hearing and smell senses in fish	
14	Presentations	
15	Digestive, excretory and reproductive systems in fish	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY3012	
Course Name	Plant Pathology	
Course Subject/Content	Course Aim; To introduce plant diseases. To study plant pathogens. Course Content; Plant disease agents, identification and control methods of disease agents, economic effects of cereal diseases and their parasites.	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can identify disease-causing agents.	
LO-2	Can understand plant diseases.	
LO-3	Can learn methods of disease control.	
LO-4	Can understand plant–pathogen relationships.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Agents that cause plant diseases	
2	Agents that cause plant diseases	
3	Agents that cause plant diseases	
4	Diagnosis of Plant Pathogens	
5	Diagnosis of Plant Pathogens	
6	Diagnosis of Plant Pathogens	
7	Diseases caused by pathogens	
8	Diseases caused by pathogens	
9	MIDTERM EXAM	
10	Diseases Caused by Pathogens	
11	Seminar	
12	Seminar	
13	Seminar	
14	Plant Disease Control	
15	Plant Disease Control	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Sunum	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY3024	
Course Name	Microbial Metabolism	
Course Subject/Content	<p>Course Aim; Providing information about the metabolism of microorganisms.</p> <p>Course Content; Bacteria's nutrient intake, aerobic and anaerobic glucose metabolism, metabolism of carbohydrates other than glucose, metabolic diversity and activities of aerobic heterotrophs, regulation of metabolism, bacterial fermentation, chemolithotrophic and phototrophic metabolism, nitrogen fixation, energy metabolism, lipid metabolism, protein and amino acid metabolism, nucleic acid metabolism, and nutrient synthesis in microorganisms.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can explain the regulation of bacterial metabolism.	
LO-2	Can identify energy production pathways in microorganisms and describe bacterial fermentations.	
LO-3	Can summarize catabolic and anabolic reactions in microorganisms.	
LO-4	Can explain molecular nitrogen fixation.	
LO-5	Can describe alternative pathways of glycolysis.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	General Characteristics of Bacteria, Cell Structure	
2	Synthesis of Cell Building Blocks	
3	Carbohydrate Metabolism	
4	Lipid Metabolism	
5	Protein and Amino Acid Metabolism	
6	Nucleic Acid Metabolism	
7	Nucleic Acid Metabolism	
8	Energy Metabolism of Microorganisms	
9	MIDTERM EXAM	
10	Aerobic Respiration in Microorganisms	
11	Anaerobic Respiration, Bacterial Fermentation Seminar Presentation	
12	Nutrition of Bacteria	
13	Nitrogen Metabolism as an Energy Source in Anaerobic Microorganisms	
14	Concepts of Primary and Secondary Metabolism	
15	Regulation of Microbial Metabolism, Operons	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Sunum	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY3014	
Course Name	Microbial Genetics	
Course Subject/Content	<p>Course Aim; The aim of this course is to provide a detailed understanding of how microorganism genetics are understood through historical and methodological approaches, experiments, and discoveries, focusing particularly on bacterial systems that serve as models for eukaryotic processes.</p> <p>Course Content; Fundamentals of genetics and microbiology, genetics of bacteriophages, extrachromosomal inheritance, gene transfer, mobile genes, genetic modification, genetic engineering and its applications.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can discuss the fundamentals of genetics and microbiology.	
LO-2	Can explain the genetics of bacteriophages and extrachromosomal inheritance.	
LO-3	Can explain gene transfer, mobile genetic elements, and genetic modification.	
LO-4	Can provide examples related to genetic engineering and its applications.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Methods and terminology	
2	Reasons for diversity	
3	Regulation of gene expression	
4	Genetics of bacteriophages and other viruses	
5	Extrachromosomal inheritance	
6	Wandering genes	
7	Gene transfer	
8	Strain development	
9	MIDTERM EXAM	
10	Genetic Recombination Applications	
11	Student Seminars	
12	Student Seminars	
13	Student Seminars	
14	Applied Genetics (Vectors)	
15	Applied Genetics (Recombinant products and applications)	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Sunum	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY3020	
Course Name	Animal Embryology	
Course Subject/Content	<p>Course Aim; The aim is to provide information about the embryological development of vertebrate and invertebrate animals..</p> <p>Course Content; Reproduction in living organisms, male reproductive system, female reproductive system, fertilization, segmentation and its types, infertility, extraembryonic structures, organogenesis, development in Amphioxus, development in honey bees, development in amphibians, development in fish, development in birds, development in mammals.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can list and compare the stages of embryological development in different animal groups and humans.	
LO-2	Can understand developmental processes and recognize recent advances in embryology.	
LO-3	Can conduct independent research to gain an advanced understanding of the basic concepts of developmental biology.	
LO-4	Can explain the development of female and male gametes.	
LO-5	Can recognize differences in egg structures and cleavage patterns among animal species.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to Embryology, Descriptive Terms	
2	Reproduction in Living Organisms	
3	Male Reproductive System	
4	Female Reproductive System	
5	Fertilization in Living Organisms	
6	Segmentation	
7	Extraembryonic Structures, Infertility (With the participation of a sector representative, obstetrician)	
8	Organogenesis	
9	MIDTERM EXAM	
10	Amphioxus Development	
11	Honey Bee Development	
12	Amphibian Development	
13	Fish Development	
14	Bird Development	
15	Mammal Development	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	USEC0014	
Course Name	Technology Addiction	
Course Subject/Content	<p>Course Aim;The aim of the Technology Addiction course is to introduce students to the risks that technology addiction can cause; to inform students about the biological, personal, and social effects of addictive technologies such as smartphones and the internet; and to enable students to gain awareness of preventive mechanisms and coping mechanisms against technology addiction.</p> <p>Course Content;The discussion of the concept of addiction; types of addiction and related theories; smartphone addiction and internet addiction; the impact of addiction on social and individual life; the relationship between technology addiction and daily life/quality of life; technology addiction, youth, and family; the effects and consequences of technology/internet addiction; prevention mechanisms and coping mechanisms for technology addiction; digital privacy and cybersecurity.</p>	
Course Hours	2	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can demonstrate knowledge of theories and concepts related to addiction and technology addiction.	
LO-2	Can recognize subtypes of technology addiction, such as smartphone addiction, internet addiction, and social media addiction, and understand their similarities and differences.	
LO-3	Can understand and analyze the effects of addictive technologies, such as smartphones and the internet, on biological, personal, and social life.	
LO-4	Can develop awareness of preventive mechanisms and coping strategies against technology addiction.	
LO-5	Can understand the importance of digital privacy and cybersecurity in the context of technology addiction.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	The Information Age, Digitalization, and Technology	
2	Different Perspectives on Technology: Technological Determinism Approaches	
3	The Birth and Rise of Machines: Questions about Technology	
4	Technology and Virtual Network Coexistence: Digital Natives and Immigrants	
5	The Individual in the Virtual World and Cyber Psychology	
6	Symptoms of Digital Illness (Cyberstalking, Digital Amnesia, Phubbing, etc.): Technology and Social Change	
7	The Concept of Addiction and Technological Addiction	
8	Debates on Technological Addiction: Problems in Cyberspace, Technological Poisoning	
9	MIDTERM EXAM	
10	Social media addiction	
11	Technology addiction and youth Digital game addiction	
12	The effects of technology addiction on romantic relationships and family	
13	Digital violence, cyberbullying, and cybersecurity	
14	Technology addiction in children	
15	Technology addiction in adults	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Homework	0	%0
Midterm Exam	1	50%
Final Exam	1	50%
Course Code	BIY4005	



Course Name	Molecular Biology Laboratory	
Course Subject/Content	Course Aim; Laboratory work aims to teach students fundamental molecular techniques and reinforce what they have learned in the Molecular Biology course using modern methods. Course Content; Preparation of culture media and bacterial culture, investigation of antibiotic resistance in bacteria, plasmid and genomic DNA isolation, protein isolation, determination of purity and quantity of nucleic acids and proteins, nucleic acid and protein electrophoresis, restriction endonucleases and their uses, gene cloning, transformation and expression, polymerase chain reaction and its applications. Laboratory work may require working outside of scheduled laboratory hours.	
Course Hours	2	
Course ECTS Credits	2	
Course Outcomes		
LO-1	Can carefully handle and isolate nucleic acids in the laboratory.	
LO-2	Can understand the principles of nucleic acid analysis methods.	
LO-3	Can apply basic nucleic acid techniques.	
LO-4	Can demonstrate knowledge of basic molecular biology laboratory safety rules.	
LO-5	Can understand and explain the use of modern molecular biology techniques.	
LO-6	Can communicate laboratory results effectively in written and oral forms.	
LO-7	Can apply basic molecular biology laboratory knowledge to the investigation of biomolecules, cellular processes, and diseases.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Health and safety precautions to be observed in the laboratory and safety rules to be followed	
2	Use of micropipettes, taking measurements and sterile techniques	
3	Preparation of bacterial culture media; Bacterial culture techniques	
4	Plasmid isolation	
5	Investigation of an antibiotic resistance enzyme	
6	Protein isolation; quantitative determination of proteins	
7	SDS-PAGE analysis	
8	DNA cutting analysis	
9	MIDTERM EXAM	
10	Preparation of recombinant DNA	
11	Preparation of competent cells	
12	Transfer of recombinant DNA to <i>E. coli</i> cells	
13	Selection and isolation of recombinant DNA	
14	Cutting and checking of recombinant DNA	
15	DNA Polymorphism experiments with PCR	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Laboratory	-	-
Quiz	-	-
Homework	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY4037	
Course Name	Molecular Biology	
Course Subject/Content	<p>Course Aim; The aim of this course is to provide an understanding of the organization and nature of genetic material, replication, genetic material transfer, mutation, and the control mechanisms of gene expression.</p> <p>Course Content; Molecular biology systems and methods, macromolecular interactions, DNA technology, DNA replication, repair, mutation, transcription and translation, gene regulation, genetic engineering, oncogenes, and cancer.</p>	
Course Hours	3	
Course ECTS Credits	7	
Course Outcomes		
LO-1	Can describe the structures and properties of nucleic acids.	
LO-2	Can explain gene organization and expression.	
LO-3	Can explain DNA replication, mutations, and repair mechanisms.	
LO-4	Can understand the principles of nucleic acid analysis methods.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Systems and Methods of Molecular Biology	
2	Genetic Analysis in Molecular Biology	
3	Macromolecules	
4	Structure of Nucleic Acids	
5	Structure of Nucleic Acids	
6	DNA Replication	
7	DNA Technology	
8	Repair	
9	MIDTERM EXAM	
10	Mutagenesis	
11	Mutations and Mutants	
12	Transcription	
13	Transcription	
14	Transcription	
15	Mechanism and Chemical Nature of Protein Synthesis	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY4021	
Course Name	Human Anatomy and Physiology	
Course Subject/Content	Course Aim; Understanding the internal structures and functions of human tissues, organs, and systems. Course Content; Anatomical terms, Tissues, Skeletal System, Muscular System, Nervous System and Brain Organization, Sensory Organs, Respiratory System, Circulatory System, Digestive System, Excretory System, Endocrine System, Reproductive System	
Course Hours	3	
Course ECTS Credits	7	
Course Outcomes		
LO-1	Can understand the internal structures and functions of the human body.	
LO-2	Can understand the relationships among organs functioning within body systems.	
LO-3	Can comprehend the organization of the systems that constitute the human body.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Anatomical terms and body planes	
2	Tissues and membranes	
3	Skeletal system	
4	Muscular system	
5	Nervous system and brain organization, cranial and spinal nerves	
6	Sensory organs	
7	Sensory organs	
8	Respiratory system	
9	MIDTERM EXAM	
10	Circulatory system	
11	Digestive system	
12	Excretory system	
13	Endocrine system	
14	Reproductive system	
15	Some important diseases seen in organs related to these systems	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY4009	
Course Name	Developmental Physiology in Plants	
Course Subject/Content	<p>Course Aim; To provide an understanding of the physiological, biochemical, and molecular mechanisms of growth and development processes in plants.</p> <p>Course Content; The mechanisms of growth in plants, internal and external factors affecting growth, plant hormones, the role of hormones in growth, germination physiology, senescence, abscission, flowering and vernalization, and movement in plants.</p>	
Course Hours	3	
Course ECTS Credits	7	
Course Outcomes		
LO-1	Can understand the difference between growth and development.	
LO-2	Can define and understand plant growth and development.	
LO-3	Can recognize the role of cell division, cell shape, and cell size in plant morphogenesis.	
LO-4	Can understand the role of plant hormones in growth.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to Plant Developmental Physiology	
2	Growth and Morphogenesis at the Cellular Level	
3	Cell Growth and Differentiation in Plants	
4	Vegetative and Reproductive Development	
5	The Role of Plant Hormones in Growth and Development	
6	Auxins	
7	Gibberellins	
8	Cytokinins	
9	MIDTERM EXAM	
10	Abscisic Acid and Ethylene	
11	Germination, Senescence, Abscission, Plant Movements	
12	Homework Presentations and Discussion	
13	Homework Presentations and Discussion	
14	Homework Presentations and Discussion	
15	Phytochromes and Morphogenesis	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY4011	
Course Name	Human Genetics	
Course Subject/Content	<p>Course Aim; The main objective of this course is to provide students with a clear presentation of the fundamental concepts and principles of the relevant topics.</p> <p>Course Content; Introduction to Human Genetics 2 Genetic Material; structure, replication, transcription, translation 3 Chromosomes 4 Mutations 5 Methods of studying genetic factors 6 Dermatoglyphs 7 Inheritance patterns 8 Examples of normal and polygenic inheritance 9 Down Syndrome, Turner Syndrome, Klinefelter Syndrome, Alzheimer's Syndrome, Parkinson's Syndrome, Sickle Cell Anemia, Thalassemia 10 Immunogenetics 11 Triple nucleotide repeats 12 Human Genome Project 13 Gene Therapy 14 Cancer 15 Stem cells 16 Recombinant DNA technology 17 SNP analyses 18 Diagnosis from genetic analyses 19 Consanguineous marriages</p>	
Course Hours	3	
Course ECTS Credits	7	
Course Outcomes		
LO-1	Can demonstrate knowledge of the human genome.	
LO-2	Can discuss the inheritance of certain human traits.	
LO-3	Can discuss karyotypes and idiograms of human chromosomes.	
LO-4	Can understand chromosomal abnormalities and the diseases associated with them.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Structure of genetic material	
2	Methods of studying genetic factors	
3	Hereditary traits and hereditary patterns	
4	Non-Mendelian inheritance	
5	Normal and polygenic inheritance	
6	Dermatoglyphs and cytogenetics	
7	Gene mapping and the Human Genome Project	
8	Genetic variation in humans	
9	MIDTERM EXAM	
10	Autosomal and gonosomal diseases in humans	
11	Molecular and biochemical basis of genetic diseases	
12	Autosomal and gonosomal diseases in humans	
13	Student presentations	
14	Treatment of genetic diseases	
15	Immune system genetics	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY4033	
Course Name	Medicinal Plants	
Course Subject/Content	<p>Course Aim; To acquire knowledge and skills about the botanical characteristics, chemical structures, medicinal properties, and uses of medicinal plants.</p> <p>Course Content; Classification of plants according to their economic value. Medicinal plants and their historical development. Identification of medicinal plants, their chemical structures. Classification of drugs, drugs, types of preparation and methods of use. Plant poisoning and first aid. Ethnobotany and ethnobotanical studies in Turkey. Botanical characteristics, drug properties, purposes and methods of use of some important medicinal plants.</p>	
Course Hours	3	
Course ECTS Credits	7	
Course Outcomes		
LO-1	Can list the medicinal plants of Türkiye.	
LO-2	Can explain the botanical characteristics of important medicinal plants.	
LO-3	Can explain the pharmacological properties of medicinal plants.	
LO-4	Can explain the active chemical compounds of medicinal plants and their pharmacological effects.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Human and Plant Kingdom	
2	Economic Plants	
3	Medicinal Plants	
4	Plants in the History of Civilization	
5	Identification of Medicinal Plants	
6	Plant Biological Diversity of Türkiye	
7	Chemical Composition of Plants: Alkaloids and Terpenoids	
8	Chemical Composition of Plants: Terpenes and Phenolic Compounds	
9	MIDTERM EXAM	
10	Herbal drugs. Cultivation of Medicinal Plants	
11	Seminar: Selected examples of important medicinal plants of our country	
12	Seminar: Selected examples of important medicinal plants of our country	
13	Seminar: Selected examples of important medicinal plants of our country	
14	Selected examples of important medicinal plants of our country	
15	Ethnobotany	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY4027	
Course Name	Environmental Health	
Course Subject/Content	<p>Course Aim; The aim of this course is to teach students about the importance of environmental health by identifying the main factors affecting our environment, how these factors harm the environment, how to minimize the impact of these harmful effects, and the scientific, professional, and ethical principles and their significance.</p> <p>Course Content; Introduction to environmental health (Definitions and general information), Major factors affecting environmental health, Air pollution and its environmental effects, Water pollution and its environmental effects, Soil pollution and its environmental effects, Solid waste and its environmental effects, Noise and its environmental effects, Radiation and its environmental effects, Infectious diseases and their environmental effects, Environmental carcinogens, Smoking and its environmental effects, Effects of technological developments on environmental health, Effects of traffic on environmental health. Scientific, Professional and Ethical Principles and Their Importance.</p>	
Course Hours	3	
Course ECTS Credits	7	
Course Outcomes		
LO-1	Can learn fundamental concepts related to environmental health.	
LO-2	Can recognize key factors affecting the environment.	
LO-3	Can understand the importance of soil, air, and water.	
LO-4	Can understand the effects of noise on human health.	
LO-5	Can apply scientific, professional, and public ethics principles.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to environmental health (Definitions and general information)	
2	Major factors affecting environmental health	
3	Air pollution and its environmental effects	
4	Water pollution and its environmental effects	
5	Soil pollution and its environmental effects	
6	Solid waste and its environmental effects	
7	Noise and its environmental effects	
8	Radiation and its environmental effects	
9	MIDTERM EXAM	
10	Infectious diseases and their environmental impacts	
11	Environmental carcinogens, Smoking and its environmental impacts	
12	The effects of technological advancements on environmental health	
13	The effects of traffic on environmental health	
14	Principles of Professional Ethics, Scientific Ethics, and Public Ethics. The necessity and importance of adhering to scientific, professional, and public ethical principles in environmental practices	
15	Student Homework presentations using Microsoft Power Point	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-



Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY4025	
Course Name	Virology	
Course Subject/Content	<p>Course Aim; The main objective of this course is to present students with the fundamental concepts and principles of the relevant topics in a clear and understandable way.</p> <p>Course Content; General information about viruses, non-enveloped positive-strand RNA viruses, enveloped positive-strand RNA viruses, negative-strand RNA viruses, viroids, other small viral RNAs associated with disease and prions, double-stranded RNA viruses, small genome DNA viruses, medium and large DNA animal viruses, medium and large bacteriophages, biological consequences of viral infections in eukaryotic cells, transformation of animal cells by tumor viruses, and biological effects of viral infections on organisms and populations.</p>	
Course Hours	3	
Course ECTS Credits	7	
Course Outcomes		
LO-1	Can gain detailed knowledge of the basic characteristics of viruses.	
LO-2	Can conduct detailed literature research on the general characteristics of a specific virus and its importance in human life.	
LO-3	Can participate in discussions on current topics in virology with classmates.	
LO-4	Can learn in detail about virus–host relationships.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Viruses and the historical development of virology	
2	Morphological structures of viruses	
3	Basic characteristics of viruses	
4	Classification of viruses	
5	Virus-host relationships and replication	
6	Genome and gene expression in viruses	
7	Viral infections	
8	Viral pathogenesis	
9	MIDTERM EXAM	
10	Immune response, viral control and disease treatment	
11	Seminars on current virus topics I	
12	Seminars on current virus topics II	
13	Seminars on current virus topics III	
14	Current methods used in clinical virology	
15	Clinical virology	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY4023	
Course Name	Plant Biochemistry	
Course Subject/Content	<p>Course Aim; Understanding the molecular mechanisms of photosynthesis, a process crucial for the continuation of life, and plant life itself.</p> <p>Course Content; Leaf cells and compartments, Photosynthesis, Cellular respiration, CO₂ assimilation, RUBISCO, Secondary metabolites, Transport and storage of polysaccharides, Nitrate assimilation, Sulfate assimilation, Nitrogen fixation, Phloem transport, Protein biosynthesis</p>	
Course Hours	3	
Course ECTS Credits	7	
Course Outcomes		
LO-1	Can learn in detail the biochemical processes occurring in a leaf cell.	
LO-2	Can understand the importance of plants for the continuity of life.	
LO-3	Can understand the role and importance of plants in biology.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Cells and organelles	
2	Photosynthesis-ETS	
3	ATP production	
4	Mitochondria and aerobic respiration	
5	Rubisco Oxygenase activity	
6	Secondary metabolites	
7	Isoprenoids	
8	Polysaccharides	
9	MIDTERM EXAM	
10	Nitrate assimilation	
11	Nitrogen fixation	
12	Sulfate assimilation	
13	Phloem transport	
14	Plant cell genome	
15	Protein biosynthesis	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY4031	
Course Name	Enzymology	
Course Subject/Content	<p>Course Aim; To learn the basic information and methods related to enzymology.</p> <p>Course Content; An overview of enzymology, general properties of enzymes, classification of enzymes, enzyme catalysis mechanisms, enzyme kinetics, enzymes used in industry - fermenter systems, enzyme isolation and purification methods.</p>	
Course Hours	3	
Course ECTS Credits	7	
Course Outcomes		
LO-1	Can gain knowledge of enzyme structure, kinetics, and catalytic mechanisms.	
LO-2	Can learn about enzymes used in biotechnological applications.	
LO-3	Can gain knowledge of enzyme purification and immobilization techniques.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Overview of enzymology, general properties of enzymes	
2	General properties of enzymes	
3	Classification of enzymes	
4	Enzyme catalysis mechanisms	
5	Enzyme kinetics	
6	Enzyme inhibitions	
7	Methods of determining enzyme activity	
8	Enzyme activity, cofactors and factors affecting enzyme activity	
9	MIDTERM EXAM	
10	Student Seminars	
11	Student Seminars	
12	Student Seminars	
13	Enzyme Isolation and Purification Methods	
14	Enzyme Immobilization	
15	Enzymes Used in Industry - Fermenter Systems	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	%0
Laboratory	0	%0
Quiz	0	%0
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY4000	
Course Name	Final Project	
Course Subject/Content	<p>Course Aim; This course aims to equip students with the skills to conduct a literature review on a given topic and to prepare and present a thesis according to established rules.</p> <p>Course Content; The process includes: determining the topic, reviewing the relevant literature, defining the content, following thesis writing guidelines, writing the thesis digitally, reviewing the thesis, preparing the poster presentation, and delivering the poster presentation.</p>	
Course Hours	4	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Can learn how to conduct a literature review.	
LO-2	Can gain the ability to write a final project on a specific topic.	
LO-3	Can learn how to prepare a poster presentation on a topic.	
LO-4	Can improve presentation skills through presenting the final project.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Topic Selection	
2	Literature Review	
3	Literature Review	
4	Literature Review	
5	Literature Review	
6	Content Selection	
7	Thesis Writing Rules	
8	Digital Thesis Writing	
9	Digital Thesis Writing	
10	Digital Thesis Writing	
11	Digital Thesis Writing	
12	Poster Presentation Preparation	
13	Poster Presentation Preparation	
14	Poster Presentation	
15	Thesis Submission	
16	Poster Presentation	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Attendance/Participation	-	-
Laboratory	-	-
Quiz	-	-
Presentation	1	50%
Homework	1	50%



Course Code	BIY4030	
Course Name	Biotechnology	
Course Subject/Content	<p>Course Aim; The aim is to provide information about the industrial use and production of all living organisms, especially microorganisms, and their products, and to instill the importance of ethical principles in biology and biotechnology.</p> <p>Course Content; Introduction to biotechnology, fundamental principles of molecular biology, modern biotechnology and tools, the general future and working methods of microorganisms, the use of microbes, cell culture, animal biotechnology, medical biotechnology, plant biotechnology, environmental biotechnology, current TOPICS in biotechnology, scientific ethics, professional ethics, public ethics, biotechnological developments and the importance of ethics, technical visits to biotechnology companies.</p>	
Course Hours	3	
Course ECTS Credits	6	
Course Outcomes		
LO-1	Can gain knowledge of microorganisms, viruses, multicellular organisms, and their biotechnological properties.	
LO-2	Can conduct detailed research on current topics in biotechnology and discuss their importance in human life.	
LO-3	Can participate in discussions on current biotechnology topics with classmates.	
LO-4	Can gain detailed knowledge of current biotechnology topics and present this knowledge as a term project.	
LO-5	Can understand the importance of scientific, professional, and public ethics principles.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Historical development of biotechnology	
2	Current overview of biotechnology	
3	Molecular biology	
4	Modern biotechnology and its tools	
5	Microbial biotechnology	
6	Microbial metabolites	
7	Cell culture	
8	Animal biotechnology	
9	MIDTERM EXAM	
10	Medical Biotechnology	
11	Seminar: Current topics in Biotechnology I	
12	Seminar: Current topics in Biotechnology II	
13	Technical Trip: Technical visits to biotechnology companies	
14	Plant and Environmental Biotechnology	
15	Professional Ethics, Scientific Ethics, Public Ethics principles and Biosafety. The necessity and importance of complying with biosafety, scientific, professional and public ethical principles in biotechnology-related applications.	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%



Final Exam	1	50%
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Course Code	BIY4042	
Course Name	Evolution	
Course Subject/Content	<p>Course Aim; The aim of this course is to teach the fundamental principles of evolution in light of recent developments. This course also aims to teach gene structures and the evolution of DNA, the application of genetic data to evolution, the organization of the eukaryotic genome, and ecological studies related to various organisms, as well as phylogenetic tree diagrams.</p> <p>Course Content; The origin and impact of evolutionary theory, the ecological aspects of evolution, heredity: productivity and mutability, diversity, mutation, population structure and genetic defects, the effect of natural selection on the genetic structure of populations, selection of characters controlled by multiple genes, speciation (species formation), adaptation, the study of evolutionary history, the history of biological diversity, biogeography, the origin of evolutionary discoveries, evolution at the molecular level, the evolution of interspecies interactions, human evolution, the social impacts of evolutionary theory, phylogenetic trees.</p>	
Course Hours	3	
Course ECTS Credits	4	
Course Outcomes		
LO-1	Can understand the concept and scope of evolution.	
LO-2	Can understand the evolutionary origins of life.	
LO-3	Can learn and relate the fundamental mechanisms of evolution.	
LO-4	Can understand the principles and methods of phylogenetics.	
LO-5	Can understand the effects of evolutionary theory on other sciences and social life.	
LO-6	Can understand the concept of phylogeny.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Definition of Evolution, The Concept of Evolution, The Origin of Life	
2	History of the Concept of Evolution and Evolutionary Theories	
3	Evidence for Evolution: Analogy and Homology	
4	Evidence for Evolution: Embryological Evidence of Evolution	
5	Evidence for Evolution: Evolutionary Paleontological Evidence	
6	Evidence for Evolution: Molecular Phylogeny	
7	Sources of Variation: Variation and Mutations	
8	Population Genetics: Hardy-Weinberg Law and Genetic Drift	
9	MIDTERM EXAM	
10	Population Genetics: Types of Natural Selection	
11	The Product of Evolution: Microevolutionary Changes	
12	The Product of Evolution: The Concept of Species and Speciation	
13	The Origin of Prokaryotes and Eukaryotes and the Evolution of Humans	
14	Phylogenetic Trees and Drawing 16S rDNA Phylogenetic Trees with Software Packages	
15	Student Homework Presentations with Presentation Programs	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Presentation	1	12%
Homework	1	18%
Midterm Exam	1	20%



Final Exam	1	50%
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Course Code	BIY4006	
Course Name	Economic Botany	
Course Subject/Content	<p>Course Aim; The main objective of this course is to provide students with a clear presentation of the fundamental concepts and principles of the relevant topics. It aims to introduce economically used plants, to focus on beneficial and harmful plants, and to provide information about the economic plant potential throughout Türkiye.</p> <p>Course Content; Introduction. Nutritional plants. Industrial plants. Spice plants. Calming plants. Medicinal plants. Ornamental plants.</p>	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Can classify plants according to the plant parts used.	
LO-2	Can gain knowledge about economically important plants.	
LO-3	Can distinguish among the different plant parts used.	
LO-4	Can explain the economic importance of plants.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to economic botany	
2	Classification of economic plants: cereals	
3	Oilseeds	
4	Vegetable plants	
5	Fruits	
6	Fiber plants	
7	Plants used in the wood and cellulose industry	
8	Plants used for sugar production	
9	MIDTERM EXAM	
10	Plants from which rubber is obtained	
11	Plants from which resin and tannin are obtained	
12	Plants from which dyes are obtained	
13	Spice plants	
14	Stimulant plants	
15	Medicinal plants	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY4012	
Course Name	Toxicology	
Course Subject/Content	<p>Course Aim; The aim of this course is to introduce students to all aspects of toxicology, particularly toxicology testing, environmental toxicology, and regulatory toxicology.</p> <p>Course Content; The foundations and principles of toxicology, absorption, distribution, release and metabolism, toxic agents, metals, pesticides, carcinogenesis, mutagenesis, developmental and reproductive toxicology, risk assessment.</p>	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Can explain the chemicals that cause damage in living systems and how this effect is demonstrated.	
LO-2	Can evaluate the basic principles in toxicity testing.	
LO-3	Can evaluate studies related to toxicology in the pharmaceutical industry, forensic science, environmental management, and academic research fields.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	The foundations and principles of toxicology	
2	Absorption, distribution, release, and metabolism	
3	Toxic agents and xenobiotics	
4	Toxic effects of certain metals and other inorganic pollutants	
5	Carcinogenesis	
6	Mutagenesis and teratogenic effects	
7	Organic pollutants and their toxic effects	
8	Environmental toxicology	
9	MIDTERM EXAM	
10	Toxicity in vaccines	
11	Drug toxicity	
12	Food toxicology-I	
13	Food toxicology-II	
14	Risk assessment	
15	Student presentation	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Quiz	-	-
Presentation	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY4014	
Course Name	Environmental Impact Assessment	
Course Subject/Content	<p>Course Aim; To inform students about the preparation of Environmental Impact Assessment (EIA) research and reports in accordance with scientific and professional ethical principles.</p> <p>Course Content; The importance of environmental impact assessment. Environmental assessment and impact assessment techniques, methods for estimating the impact of environmental changes, procedures and policies in environmental impact assessment, rules and technical requirements of impact assessment. Evaluation of large and widespread construction projects in terms of environmental impact assessment. The roles of environmental laws, regulations, and economic forces in the design of large projects. Current environmental impact assessment methods and assessment models used. Scientific, Professional, and Ethical Principles and Their Importance.</p>	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Can interpret environmental concepts	
LO-2	Can learn about environmental laws	
LO-3	Can apply new environmental techniques	
LO-4	Can prepare environmental impact assessment reports	
LO-5	Can apply scientific, professional ethics and public ethics principles	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	The importance of environmental impact assessment.	
2	Environmental assessment and impact assessment techniques	
3	Methods for estimating the impact of environmental changes,	
4	Procedures and policies in environmental impact assessment	
5	Rules and technical requirements of impact assessment.	
6	Evaluation of large and widespread construction projects in terms of environmental impact assessment.	
7	The roles of environmental laws, regulations, and economic forces in the design of large projects.	
8	Current environmental impact assessment methods and impact assessment models used.	
9	MIDTERM EXAM	
10	Environmental Impact Assessment (EIA) Report Preparation 1 Principles of Professional Ethics, Scientific Ethics, and Public Ethics	
11	EIA Report Preparation 2 and the Necessity and Importance of Adhering to Scientific	
12	Professional, and Public Ethics Principles in Reports	
13	Presentation	
14	Global Warming Presentation	
15	Fieldwork	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Quiz	-	-
Presentation	-	-
Midterm Exam	1	50%
Final Exam	1	50%



Course Code	BIY4022	
Course Name	Vegetation Science	
Course Subject/Content	Course Aim; To introduce flora and vegetation. To identify vegetation types. To analyze vegetation outcomes. Course Content; Introduction, concepts of flora and vegetation, plant communities, methods of vegetation analysis, classification of vegetation.	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Can recognize plant formations.	
LO-2	Can understand and classify succession processes.	
LO-3	Can identify plant diversity.	
LO-4	Can identify vegetation diversity using scientific methods.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Flora and vegetation	
2	Origin and development of vegetation	
3	Importance of vegetation research	
4	Types of vegetation	
5	Plant communities	
6	Succession and climax	
7	Biological types	
8	Biological spectrum	
9	MIDTERM EXAM	
10	Vegetation research methods	
11	Seminar	
12	Seminar	
13	Vegetation research methods	
14	Fieldwork	
15	Technical trip	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Quiz	-	-
Application	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY4026	
Course Name	Biological Control	
Course Subject/Content	<p>Course Aim; The aim is to impart to students knowledge on how to combat insects that cause damage in agricultural and forestry areas by using organisms or their products.</p> <p>Course Content; The historical development and overview of biological control. Mass production, storage, transportation, and application of biological control materials. Various materials used in biological control. Organisms used in biological control: Predators and parasitoids, viruses, bacteria, fungi, nematodes, protozoa. Biological control applications in Türkiye. Important natural and common pests and their natural enemies in Türkiye.</p>	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Can gain detailed knowledge of insect pathology and the use of pathogens in biological control.	
LO-2	Can conduct detailed literature research on a specific topic and explain its importance in agriculture and forestry.	
LO-3	Can discuss a wide range of current topics with classmates.	
LO-4	Can learn about resistance mechanisms developed by insects against pesticides.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Historical development and overview of biological control	
2	Mass production, storage, transportation and application of biological control materials	
3	Various materials used in biological control	
4	Organisms used in biological control: Predators and parasitoids	
5	Organisms used in biological control: Viruses	
6	Organisms used in biological control: Bacteria	
7	Organisms used in biological control: Fungi	
8	Organisms used in biological control: Nematodes	
9	MIDTERM EXAM	
10	Organisms used in biological control: Protozoa	
11	Seminar: Current topics I in Biological Control	
12	Seminar: Current topics II in Biological Control	
13	Seminar: Current topics III in Biological Control	
14	Biological control applications in Türkiye Common pests and their natural enemies in Türkiye	
15	Technical trip	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Quiz	-	-
Homework	1	20%
Midterm Exam	1	30%
Final Exam	1	50%



Course Code	BIY4020	
Course Name	Immunology	
Course Subject/Content	Course Aim; To inform students about how the immune system is formed and the latest research on this topic. Course Content; Introduction to immunology, innate immunity, acquired immunity, antigen-recognizing molecules, antigen recognition, acquired immune response, immunity to infection, hypersensitivity reactions, transplantation, autoimmune diseases.	
Course Hours	3	
Course ECTS Credits	5	
Course Outcomes		
LO-1	Can explain what immunology is and describe the historical development of immunology.	
LO-2	Can describe innate and acquired immunity.	
LO-3	Can discuss antibodies.	
LO-4	Can explain the immune response that occurs against infections.	
COURSE SCHEDULE		
WEEKS	TOPICS	
1	Introduction to Immunology and History	
2	Cells of the Immune System	
3	Organs of the Immune System	
4	Antigen Molecules and Antigen-Recognizing Molecules	
5	Antibodies	
6	Human Leukocyte Antigens	
7	Immune Response	
8	In-Vivo Antigen-Antibody Binding, Hypersensitivity Reactions	
9	MIDTERM EXAM	
10	Autoimmunity	
11	Student Presentations	
12	Immunological Surveillance	
13	Methods of Measuring Humoral Immune Response	
14	Immunity in Infections	
15	Vaccines and Serums	
16	FINAL EXAM	
ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Quiz	-	-
Homework	1	10%
Midterm Exam	1	40%
Final Exam	1	50%



Course Code	BIY4044
Course Name	Antioxidants and Nutrition
Course Subject/Content	<p>Course Aim; The aim of this course is to provide students with knowledge and skills in the following topics: the definition and sources of free radicals, the examination of the pathophysiological effects of radicals, antioxidants, sources of antioxidants, the role of antioxidants in nutrition, and the effect of antioxidants on free radicals.</p> <p>Course Content; Cells and organelles, Secondary metabolites, Phenolic compounds, Flavonoids, Anthocyanins, Phenolic acids, Non-enzymatic antioxidants other than phenolic compounds, Thiol compounds, Enzymatic antioxidants, Oxidative stress, Major antioxidant-containing plants, Effect of antioxidants on organ damage, Meeting daily antioxidant needs, Antioxidant nutrition in pregnancy and old age.</p>
Course Hours	3
Course ECTS Credits	5
Course Outcomes	
LO-1	Can define and classify antioxidants.
LO-2	Can demonstrate knowledge of the mechanisms of action of antioxidants.
LO-3	Can define free radicals and demonstrate knowledge of their types, sources, and effects.
LO-4	Can demonstrate knowledge of the role and importance of antioxidants in nutrition.
COURSE SCHEDULE	
WEEKS	TOPICS
1	Introduction to the cell: cell structure, membrane structure, membrane transport, organelles and their functions
2	Secondary metabolites: precursor compounds, classification, synthesis pathways, and relationships with cellular organelles
3	Phenolic compounds: classification, synthesis pathways, antioxidant properties, polyphenols, catechins, and roles in human health
4	Flavonoids: classification, synthesis pathways, chemical structure, antioxidant properties, and roles in human health
5	Anthocyanins: classification, synthesis pathways, chemical structure, antioxidant properties, and roles in human health
6	Phenolic acids: classification, chemical structure, antioxidant properties, and roles in human health
7	Non-enzymatic antioxidants other than phenolic compounds: ascorbic acid, tocopherol, carotenoids, melatonin, and their roles in human health
8	Thiol compounds: cysteine, glutathione, N-acetylcysteine, methionine, lipoic acid, and their roles in human health
9	MIDTERM EXAM
10	Enzymatic antioxidants: competitive and non-competitive inhibition; superoxide dismutase; glutathione peroxidase; glutathione S-transferase; catalase; mitochondrial cytochrome oxidase
11	Oxidative stress; oxidative damage in biopolymers; classification of free radicals; reactive oxygen species; reactive nitrogen species; interactions of free radicals with cellular structures; role of antioxidants in preventing oxidative stress
12	Major antioxidant-containing plants, vegetables, fruits, and nuts; importance of natural antioxidants; proper consumption of antioxidant-rich foods
13	Effects of antioxidants on organ damage; antioxidant–disease relationships (cancer, metabolic disorders, effects on hair, bone, and skin); effects on cholesterol, allergy, and inflammation
14	Daily antioxidant requirements; antioxidant absorption; antioxidant deficiency and excess
15	Antioxidant nutrition during pregnancy; anti-aging effects; antioxidant nutrition in immune protection
16	FINAL EXAM



ASSESSMENT METHODS AND GRADING		
Type of Assessment	Number	Weight (%)
Quiz	-	-
Homework	-	-
Midterm Exam	1	50%
Final Exam	1	50%

