

## SCIENCE EDUCATION IN PRIMARY EDUCATION PROGRAMMERS

FIRST YEAR												
I. SEMESTER						II. SEMESTER						
Kodu	Dersin Adı	T	U	K	ECTS	Kodu	Dersin Adı	T	U	K	ECTS	
FEN147	History of Turkish Revolution & Principles of M.Kemal Atatürk I	2	0	2	2	FEN140	History of Turkish Revolution & Principles of M.Kemal Atatürk II	2	0	2	2	
FEN149	Turkish I :Written Expression	2	0	2	2	FEN142	Turkish II : Spoken Expression	2	0	2	3	
FEN151	Introduction to Science of Education	3	0	3	5	FEN144	Educational Psychology	3	0	3	4	
FEN137	General Physics I	4	0	4	6	FEN130	General Physics II	4	0	4	6	
FEN139	General Physics Laboratory I	0	2	1	2	FEN132	General Physics Laboratory II	0	2	1	2	
FEN141	General Chemistry I	4	0	4	6	FEN134	General Chemistry II	4	0	4	6	
FEN143	General Chemistry Laboratory I	0	2	1	2	FEN136	General Chemistry Laboratory II	0	2	1	2	
FEN145	General Mathematics I	4	0	4	5	FEN138	General Mathematics II	4	0	4	5	
<b>Total Credit</b>		<b>19</b>	<b>4</b>	<b>21</b>	<b>30</b>	<b>Total Credit</b>		<b>19</b>	<b>4</b>	<b>21</b>	<b>30</b>	

SECOND YEAR												
III. SEMESTER						IV. SEMESTER						
Kodu	Dersin Adı	T	U	K	ECTS	Kodu	Dersin Adı	T	U	K	ECTS	
FEN241	Foreign Language I	3	0	3	4	FEN240	Foreign Language II	3	0	3	5	
FEN239	Computer Studies I	2	2	3	5	FEN238	Computer Studies II	2	2	3	5	
FEN243	Principles and Methods of Teaching	3	0	3	5	FEN244	Science-Technology Program and Planning	3	0	3	5	
FEN233	General Physics III	2	0	2	4	FEN234	Introduction to Modern Physics	2	0	2	2	
FEN235	General Physics Laboratory III	0	2	1	2	FEN236	General Chemistry IV (Organic Chemistry)	2	0	2	2	
FEN237	General Chemistry III (Analytical Chemistry)	2	2	3	4	FEN230	General Biology II	4	0	4	6	
FEN229	General Biology I	4	0	4	4	FEN232	General Biology Laboratory. II	0	2	1	2	
FEN231	General Biology Laboratory I	0	2	1	2	FEN242	Elective I (Science And Technology Education And Configure)	2	0	2	3	
<b>Total Credit</b>		<b>16</b>	<b>8</b>	<b>20</b>	<b>30</b>	<b>Total Credit</b>		<b>18</b>	<b>4</b>	<b>20</b>	<b>30</b>	

THIRD YEAR												
V. SEMESTER						VI. SEMESTER						
Kodu	Dersin Adı	T	U	K	ECTS	Kodu	Dersin Adı	T	U	K	ECTS	
FEN341	History of Turkish Education	2	0	2	4	FEN346	Measurement and Evaluation	3	0	3	4	
FEN345	Instructional Technology and Material Development	2	2	3	6	FEN334	Nature Of Science And History Of Science	3	0	3	4	
FEN343	Scientific Resesarch Methods	2	0	2	3	FEN342	Community Service Application	1	2	2	4	
FEN339	Science Teaching Laboratory Practice I	2	2	3	5	FEN344	Special Teaching Methods I	2	2	3	4	
FEN333	Special Topics in Physics	2	0	2	4	FEN340	Science Teaching Laboratory Practice II	2	2	3	4	
FEN335	Special Topics in Chemistry	2	0	2	4	FEN338	Geology	2	0	2	3	
FEN331	Human Anatomy And Physiology	2	0	2	2	FEN336	Science of Environment	3	0	3	4	
FEN337	Statistics	2	0	2	2	FEN332	Genetic and Biotechnology	2	0	2	3	
<b>Total Credit</b>		<b>16</b>	<b>4</b>	<b>18</b>	<b>30</b>	<b>Total Credit</b>		<b>18</b>	<b>6</b>	<b>21</b>	<b>30</b>	

FOURTH YEAR											
VII. SEMESTER						VIII. SEMESTER					
Kodu	Dersin Adı	T	U	K	ECTS	Kodu	Dersin Adı	T	U	K	ECTS
FEN437	Guidance	3	0	3	5	FEN432	Turkish Educational System and School Management	2	0	2	2
FEN433	Special Education	2	0	2	4	FN430	Teaching Practice	2	6	5	10
FEN439	Classroom Management	2	0	2	4	FEN422	Astronomy	2	0	2	3
FEN431	Special Teaching Methods II	2	2	3	4	FEN424	Elective II (Optical Physics)	2	0	2	5
FEN435	School Experience	1	4	3	5	FEN426	Elective III	2	0	2	5
FEN427	Special Topics In Biology	2	0	2	3	FEN428	Elective IV (Science And Technology Society)	2	0	2	5
FEN429	Evolution	2	0	2	5						
<b>Total Credit</b>		<b>18</b>	<b>4</b>	<b>20</b>	<b>30</b>	<b>Total Credit</b>		<b>12</b>	<b>6</b>	<b>15</b>	<b>30</b>

## I.SEMESTRE

### TAR 101 History of Turkish Revolution & Principles of M.Kemal Atatürk I

<b>Course Code</b>	TAR 101
<b>Course Title</b>	History of Turkish Revolution & Principles of M.Kemal Atatürk I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Credit)</b>	2-0-2
<b>Duration</b>	1 Semester
<b>Semester</b>	1. Semester
<b>Examination</b>	Mid-term exam, final exam.
<b>Assessment</b>	Mid-term exam % 30, final exam % 70
<b>Description</b>	The main aim of the course is to encourage the students to adopt the democratic values as the only way of a modern life and to incite them to defend these values. This course allows the students to be sensitive to the revolutionary principles of Atatürk and to induce them to protect the contemporary, secular and democratic values.
<b>Course Content</b>	Description of the term "revolution"; major historical events in the Ottoman Empire to the end of World War I; World War I; a general overview of Mustafa Kemal's life; certain associations and their activities; arrival of Mustafa Kemal to Samsun; the congresses, gathering of the last Ottoman Assembly and the proclamation of the "national oath"; opening of the Turkish Grand National Assembly; War of independence to the Victory of Sakarya; Victory of Sakarya; financial sources of the war of independence; grand counter-attack; Armistice of Mudanya; abolition of the Sultanate; Peace Conference of Lausanne.
<b>Learning Outcomes</b>	By the end of this module students will be able to: 1. Utilize their knowledge of social sciences 2. Analyze, evaluate and interpret historical data 3. Arrange group works 4. Get the consciences of professional and ethical responsibility 5. Establish an effective oral and inscriptive communication 6. Understand the national and universal impacts of the historical data 7. Recognize the need for life-long learning and application

	<p>8. Remain up-to-date with professional and contemporary issues</p> <p>9. Make scientific researches separately or under the guidance of an advisor</p>
<b>Read List</b>	<p>1. Mustafa Kemal Atatürk, <b>Nutuk (Söylev)</b>, C.I-II, T.T.K., Ankara, 1986.</p> <p>2. <b>Atatürk'ün Söylev ve Demeçleri</b>, C.I-V, Ankara, 1983-1987.</p> <p>3. Niyazi Berkes, <b>Türkiye'de Çağdaşlaşma</b>, İstanbul, 1978.</p> <p>4. Afet A. İnan, <b>Medeni Bilgiler</b>, Ankara, 1987.</p> <p>5. Enver Ziya Karal, <b>Atatürk ve Devrim (Konferanslar ve Makaleler)</b>, T.T.K., Ankara, 1980.</p> <p>6. Enver Ziya Karal, <b>Atatürk'ten Düşünceler</b>, M.E.B. Yay., Ankara, 1981.</p> <p>7. Bernard Lewis, <b>Modern Türkiye'nin Doğuşu</b>, Çev.M.Kıratlı, T.T.K.,Ankara, 1970.</p> <p>8. Ahmet Mumcu, <b>Tarih Açısından Türk Devriminin Temelleri ve Gelişimi</b>, Ankara, 1976.</p> <p>9. <b>Atatürk İlkeleri ve İnkılap Tarihi</b>, C.I-II, YÖK Yay., Ankara, 1986-1989.</p>

## TUR 151 Turkish I : Written Expression

<b>Course Code</b>	TUR 151
<b>Course Title</b>	Turkish I : Written Expression
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Credit)</b>	2-0-2
<b>Duration</b>	1 Semester
<b>Semester</b>	1. Semester
<b>Examination</b>	Mid-term exam, final exam.
<b>Assessment</b>	Mid-term exam % 30, final exam % 70
<b>Description</b>	The main object of the course is to develop the students listening, reading, thinking, understanding and written expression skills.
<b>Course Content</b>	Writing language and its characteristics, basic differences between writing language and speaking language. Expression: Written and oral expression; subjective expression, objective expression; paragraph; paragraph types (introduction-improvement-conclusion). Definition of writings and types (information writings, literature writings); rules in a being writing. Written expression (written composition: free composition, planned composition ); levels of planned writing (theme, border of theme, aim, point of view, determination of major and minor thinking; preparing of composition plan, page setup); theoretical knowledge on informatics texts (petition or letter of application, letter, news, decision, announcement/advertisement, records, report, official writings, scientific writings; writing practice; noting and summarizing methods and techniques; correction studies of language and expression mistakes in composition.
<b>Learning Outcomes</b>	<p>By the end of this module:</p> <p>Being able to use Turkish language correctly and effectively</p> <ol style="list-style-type: none"> <li>1. Having scientific and objective thinking skills</li> <li>2. Having writing skills fitted with rules</li> <li>3. Being able to use paragraphs correctly in writing</li> <li>4. Being able to arrange written notice, bibliyography and report</li> <li>5. Understanding and expressing thoughts correctly</li> <li>6. Being able to understand and summarize a book</li> <li>7. Having noting skills</li> <li>8. Being able to write a story, poem ect</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Yüksek Öğretim Öğrencileri için Türk Dili ve Kompozisyon Bilgileri (Prof.Dr. Z. Korkmaz, Prof.Dr. Hamza Zülfikar vd.)</li> <li>2. Konulara göre, değişik kaynaklara baş vurulacaktır.</li> </ol>

## EGB 151 Introduction to Science of Education

<b>Course Code</b>	EGB 151
<b>Course Title</b>	Introduction to Science of Education
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	6
<b>Weekly (Lectures-Practice-Laboratory)</b>	3-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	1. Semester
<b>Examination</b>	Mid-term exam and homework, final exam
<b>Assessment</b>	Mid-term exam 30%, final exam 70%
<b>Description</b>	The main object of the course is to introduce methods of educational science, teaching as a profession; practices and developments in teacher training
<b>Course Content</b>	Basic concepts of education, the relationship between education and the other social sciences and its functions (philosophical, social, legal, physiological economical, and political foundations of education), Historical development of science of education, tendencies of educational sciences in 21.century, research methods in science of education, structure and properties of Turkish National Educational System, the role of instructors in educational system, properties of Teaching Profession, Applications and developments in teacher education.
<b>Learning Objectives</b>	By the end of the course students should be able to: 1. understand the basic principles and characteristics of the teaching profession 2. analyze the teaching profession 3. analyze the social foundations of education 4. analyze the psychological foundations of education 5. analyze the political foundations of education 6. analyze the economical foundations of education 7. analyze the historical foundations of education 8. analyze the Turkish educational system 9. analyze alternative perspectives in education.
<b>Read List</b>	Şişman, Mehmet (2005). <b>Öğretmenliğe Giriş</b> . Ankara: Pegema. Demirel, Ö ve Z. Kaya. (2006). <b>Eğitim Bilimine Giriş</b> . Ankara: Pegema. Kıroğlu, K. Ve C.Elma (2009). <b>Eğitim Bilimine Giriş</b> . Ankara: Pegema. Kıncal, Remzi (2006). <b>Öğretmenlik Mesleğine Giriş</b> . Ankara:Nobel

## KİM 151 General Chemistry I

<b>Course Code</b>	KİM 151
<b>Course Title</b>	General Chemistry I
<b>Instructor's Name</b>	M.Salih KESKİN
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	4
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-</b>	4-0-0

<b>Laboratory)</b>	
<b>Duration</b>	1 Semester
<b>Semester</b>	1. Semester
<b>Examination</b>	Mid-term exam, Laboratory and final exam, written form
<b>Assessment</b>	Mid-term-50% ,Laboratory-10% final exam-40%
<b>Description</b>	The main object of the course is to strengthen insights into the fundamental concepts of chemistry related to topics of course and to improve the knowledge of students to be able to make comments.
<b>Course Content</b>	Description, areas, importance of chemistry, effect living and , brief regard to the story of its development matter and its properties, scientific method, significant figures, properties and classification of matter, atom and its electron structure: nuclear atom, atomic theories, electron structure. Chemical compound: introduction to periodic table, types of chemical compounds and their formulas. Chemical reactions: Chemical equations, acid- base reactions,oxidation- reduction reactions. Gases: The ideal gases, nonideal gases . Thermochemistry: entalpy, internal energy, entropy. Periodic table: Classification of elements, periodic properties of the elements. Chemical compound: formation of compound, ( hybridization, formation of hybrid orbitals and moleculer geometri), formulas, species and properties. Chemical bounds: Basic concept, bound theories and bound kinds
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. apply knowledge of basic chemistry</li> <li>2. conduct applications as well as to analyze and interpret data</li> <li>3. function on multi-disciplinary teams</li> <li>4. identify, formulate, and solve chemical problems</li> <li>5. computer, software as contemporary methods, techniques apply to chemistry</li> <li>6. communicate effectively</li> <li>7. understand the broad education necessary to understand the impact of chemical solutions in a global and societal context</li> <li>8. get a recognition of the need for, and an ability to engage in life-long learning</li> <li>9. gain a knowledge of contemporary issues</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Petrucci,R., Harwood, W., (1994)</b>, Genel Kimya I, ANKARA</li> <li>2. <b>Petrucci,R., Harwood, W., (1994)</b>, Genel Kimya II, ANKARA</li> <li>3. <b>Chang, R.,(2000)</b>, Kimya, İSTANBUL</li> </ol>

## KİM 153 General Chemistry Laboratory I

<b>Course Code</b>	KİM 153
<b>Course Title</b>	General Chemistry Laboratory I
<b>Instructor's Name</b>	M. Salih KESKİN
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	First
<b>Prerequisites</b>	None
<b>Local Credits</b>	1
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	0-2-0
<b>Duration</b>	1 semester
<b>Semester</b>	1. Semester
<b>Examination</b>	Laboratory and final exam, written form
<b>Assessment</b>	Laboratory-30% final exam-70%
<b>Description</b>	The main object of the course is to provide to be managed experiment in laboratory and to give information about experiment technics, to improve the skill of student making experiment related to course contents.
<b>Course Content</b>	Studying techniques of chemical Laboratory, safety rules, accidents and precautions, safety marks and their

	meanings on chemical materials, equipment and materials which must be in chemical laboratory and their using, the rules while working with chemical materials in chemical laboratory and their importance, the rules while working with mercury, poisoned by mercury and it's symptom, experiment which are parallel to the courses and suitable to topics of course students level.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. gain the supplement knowledge to basic chemistry</li> <li>2. synthesis the knowledge on science with the content of this course</li> <li>3. analyze and estimate the data in the related scientific problem</li> <li>4. learn and distinguish the content and type of knowledge on science</li> <li>5. gain ability on research and learn scientific method</li> <li>6. gain the ability to attain balance between oral, written and applied scientific activities</li> <li>7. get professional qualification on this course and gain ability to follow the knowledge in contemporary issues</li> <li>8. apply the content of this course on current subject</li> <li>9. design and conduct experiments as well as to analyze and interpret data</li> <li>10. use techniques, skills, and modern tools necessary for practice in chemistry</li> <li>11. get information about definition, formulation and solution of problems</li> <li>12. gain ability on teamwork</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Kimya laboratuvar deneyler Ayhan NAZLI</b></li> <li>2. <b>Modern temel kimya laboratuvarı Prof. Dr. Mustafa Özcan</b></li> </ol>

## FİZ 151 General Physics I

<b>Course Code</b>	FİZ 151
<b>Course Title</b>	General Physics I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	4
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-Laboratory)</b>	4-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	1. Semester
<b>Examination</b>	One mid-term exam, end-of-term exam
<b>Assessment</b>	Mid-term exam 30%, end of term exam 70%
<b>Description</b>	The main object of the course is to provide a basic understanding of Newtonian mechanics and conservation laws.
<b>Course Content</b>	Physics and measurement; vectors; one-dimensional motion; motion in two-dimensions; laws of motion; circular motion; work and energy; conservation and conversion of energy; linear momentum and collisions; rotation of a rigid body about a fixed axis; rotational motion; angular momentum; static equilibrium and elasticity; simple harmonic motion; oscillation of the systems with multi degree of freedom; forced oscillations; traveling waves; the reflection and transmission of waves; pulses and wave packets; diffraction and interference; sound and propagation of sound.
<b>Learning Objectives</b>	<ol style="list-style-type: none"> <li>1. Understand vector and scalar quantities.</li> <li>2. Identify, formulate, and solve problems analytically that appear in physical systems.</li> <li>3. Analyze and resolve natural phenomenon.</li> <li>4. Associate the gained knowledge, analyze and interpret data.</li> <li>5. Apply and link the gained knowledge of natural sciences to interdisciplinary fields.</li> <li>6. Correlate and apply gained knowledge directly with technology and industry.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Halliday, D. , Resnick, R., &amp; Walker, J. (2006) 6th ed.</b> Fundamentals of Physics. New York: John Wiley &amp; Sons, Inc.</li> </ol>

	<ol style="list-style-type: none"> <li>2. <b>Serway, R.A. (1990).</b> Physics for Scientists and Engineers. Philadelphia: Saunders College Publishing.</li> <li>3. <b>Fishbane, P.M., Gasiorowicz, S., &amp; Thornton, S.T. (1996).</b> Physics for Scientists and Engineers. Prentice Hall, Inc.</li> <li>4. Any equivalent book.</li> </ol>
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## FİZ 153 General Physics Laboratory I

<b>Course Code</b>	FİZ 153
<b>Course Title</b>	General Physics Laboratory I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	First
<b>Prerequisites</b>	None
<b>Local Credits</b>	1
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Credit)</b>	0-2-0
<b>Duration</b>	1 Semester
<b>Semester</b>	1. Semester
<b>Examination</b>	Mid-term exam, final exam and project , written form.
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	The main object of the course is to strengthen insights into the fundamental concepts of physics related to Newtonian mechanics through direct investigations and provide hands-on experience
<b>Course Content</b>	Motion with constant velocity, Freely Falling, Force types and Lami Theorem, Density and Buoyant Force, Friction force of solids and liquids, Equilibrium and moment, Pulleys, Slope surface and Conservation of work, Transformation of potential energy to kinetic energy, Calculation of spring constant and Elastic potential energy of spring, Momentum conservation in a two dimensional system, pressure of solids and liquids, Simple pendulum
<b>Learning Outcomes</b>	
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>ARAL, E., BİLGİN, V., KILIÇ, G., İŞSEVER, G.</b> U. Fizik 1–2 Laboratuar Deneysel Deney Kitabı T.C. Eskişehir Osmangazi Üniversitesi Yayınları, No:96.</li> <li>2. <b>Halliday, D. , Resnick, R., &amp; Walker, J. (2006) 6th ed.</b> Fundamentals of Physics. New York: John Wiley &amp; Sons, Inc.</li> <li>3. <b>Serway, R.A. (1990).</b> Physics for Scientists and Engineers. Philadelphia: Saunders College Publishing.</li> <li>4. Any equivalent book.</li> </ol>

## MAT 155 General Mathematics I

<b>Course Code</b>	MAT 155
<b>Course Title</b>	General Mathematics I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	4
<b>ECTS Credits</b>	5

<b>Weekly (Lectures-Practice-Laboratory)</b>	4-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	1. Semester
<b>Examination</b>	Mid-term exam and final exam, written form
<b>Assessment</b>	Mid-term exam-% 30, final exam- % 70
<b>Description</b>	To give fundamentals of mathematics knowledge, to be able to analyse the problem which are met in the fields of mathematics and to gain the ability of problem solving, to gain analytical thinking, discussion and evaluation.
<b>Course Content</b>	Numbers: number systems and their properties, mathematical induction, interval, absolute value. Relation: ordered pairs, Cartesian product, Definiton of relation, properties of relation, inverse relation, equivalence relation, ordered relation. Function: Definiton of function and its properties, Function types, inverse function, resultant of function, trigonometric functions, exponential functions, logarithmic functions, inverse trigonometric functions, special described functions. Limit: Limit of one variable, limit of a function, limit of trigonometric functions. Continuity: Definiton of continuity, Continuity from right and left, properties of continuous functions, types of continuity, Derivative: Definiton of derivatives, geometric interpretation of derivative, rules of differentiation, higher derivatives
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. have the fundamentals of mathematical knowledge and culture.</li> <li>2. have analytical thinking and evaluation</li> <li>3. have the skill of evaluation and studying the problems which occur in other disciplines</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Görgülü, A. Genel Matematik I</li> <li>2. Balcı M., analiz I</li> <li>3. Karadeniz A. Yüksek Matematik Problemleri</li> <li>4. Tayfur C. Çözümlü Diferensiyel ve İntegral Hesap Problemleri</li> <li>5. Boyse D. Calculus</li> </ol>

## II.SEMESTRE

### TAR 102 History of Turkish Revolution & Principles of M.Kemal Atatürk II

<b>Course Code</b>	TAR 102
<b>Course Title</b>	History of Turkish Revolution & Principles of M.Kemal Atatürk II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	2. Semester
<b>Examination</b>	Mid-term exam, final exam.
<b>Assessment</b>	Mid-term exam % 30, final exam % 70
<b>Description</b>	The main aim of the course is to encourage the students to adopt the democratic values as the only way of a modern life and to incite them to defend these values. This course allows the students to be sensitive to the revolutionary principles of Atatürk and to induce them to protect the contemporary, secular and democratic values.
<b>Course Content</b>	Political reforms, Political party and trial period into the multi party politics, legal reforms, social reforms, economic reforms, Foreign policy of Turkish republic during 1923-1938 period, , Foreign policy of

	Turkish republic after Atatürk's death, Principles of Turkish Revolution: (Republicanism, Nationalism, Populism, Etatism, Reformism, Secularism). Supplementary Principles.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Utilize their knowledge of social sciences</li> <li>2. Analyze, evaluate and interpret historical data</li> <li>3. Arrange group works</li> <li>4. Get the consciences of professional and ethical responsibility</li> <li>5. Establish an effective oral and inscriptive communication</li> <li>6. Understand the national and universal impacts of the historical data</li> <li>7. Recognize the need for life-long learning and application</li> <li>8. Remain up-to-date with professional and contemporary issues</li> <li>9. Make scientific researches separately or under the guidance of an advisor</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Mustafa Kemal Atatürk, <b>Nutuk (Söylev)</b>, C.I-II, T.T.K., Ankara, 1986.</li> <li>2. <b>Atatürk'ün Söylev ve Demeçleri</b>, C.I-V, Ankara, 1983-1987.</li> <li>3. Niyazi Berkes, <b>Türkiye'de Çağdaşlaşma</b>, İstanbul, 1978.</li> <li>4. Afet A. İnan, <b>Medeni Bilgiler</b>, Ankara, 1987.</li> <li>5. Enver Ziya Karal, <b>Atatürk ve Devrim (Konferanslar ve Makaleler)</b>, T.T.K., Ankara, 1980.</li> <li>6. Enver Ziya Karal, <b>Atatürk'ten Düşünceler</b>, M.E.B. Yay., Ankara, 1981.</li> <li>7. Bernard Lewis, <b>Modern Türkiye'nin Doğuşu</b>, Çev.M.Kıratlı, T.T.K.,Ankara, 1970.</li> <li>8. Ahmet Mumcu, <b>Tarih Açısından Türk Devriminin Temelleri ve Gelişimi</b>, Ankara, 1976.</li> <li>9. <b>Atatürk İlkeleri ve İnkılap Tarihi</b>, C.I-II, YÖK Yay., Ankara, 1986-1989.</li> </ol>

## MAT 156 General Mathematics II

<b>Course Code</b>	MAT 156
<b>Course Title</b>	General Mathematics II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	4
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-Laboratory)</b>	4-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	2. Semester
<b>Examination</b>	Mid-term exam and, final exam , written form.
<b>Assessment</b>	Mid-term exam -30%, final exam-70%
<b>Description</b>	The main purpose of the course, after completing the course the student should be able to work mathematics and other related fields.
<b>Course Content</b>	<ol style="list-style-type: none"> <li>1. Curve Sketching in Polar Coordinates</li> <li>2. The Integral</li> <li>3. Applications of the Integral</li> <li>4. Arc Length</li> </ol>
<b>Learning Objectives</b>	
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Genel Matematik (Prof.Dr. Ali Görgülü)</li> <li>2. Çözümlü Dif. Ve İnt. Hesap Problemleri (Prof.Dr. Coşkun Tayfur)</li> </ol>

## KİM 152 General Chemistry II

<b>Course Code</b>	KİM 152
<b>Course Title</b>	General Chemistry II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	4
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-Laboratory)</b>	4-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	2. Semester
<b>Examination</b>	Mid-term exam and final exam, written form..
<b>Assessment</b>	Mid-term-30% , final exam-70%
<b>Description</b>	The main object of the course is to strengthen insights into the fundamental concepts of chemistry related to topics of course and to improve the knowledge of students to be able to make comments.
<b>Course Content</b>	Chemical Kinetics: The rate of law, the rate and measuring of reaction. Chemical equilibrium: Basic principles, equilibrium constant, effect of faktor on equilibrium. Thermochemistry: entalpy, internal energy, entropy. Acids and bases: Arrhenius theory, Brönsted-Lowry theory, strong acids and strong bases, weak acids and weak bases, acids and bases reactions and hydrolysis. Solubility and complex-ion equilibra: solubility product constantsettling. Main group elements II ametals: noble gases, halogens, oxygen and nitrogen families, carbon and silicon, boron. Electrochemistry: electrolysis and battery.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. apply knowledge of basic chemistry</li> <li>2. conduct applications as well as to analyze and interpret data</li> <li>3. function on multi-disciplinary teams</li> <li>4. identify, formulate, and solve chemical problems</li> <li>5. computer, software as contemporary methods, techniques apply to chemistry</li> <li>6. communicate effectively</li> <li>7. understand the broad education necessary to understand the impact of chemical solutions in a global and societal context</li> <li>8. get a recognition of the need for, and an ability to engage in life-long learning</li> <li>9. gain a knowledge of contemporary issues</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Petrucci,R., Harwood, W., (1994), Genel Kimya I, ANKARA</li> <li>2. Petrucci,R., Harwood, W., (1994), Genel Kimya II, ANKARA</li> <li>3. Chang, R.,(2000), Kimya, İSTANBUL</li> </ol>

## FİZ 152 General Physics II

<b>Course Code</b>	FİZ 152
<b>Course Title</b>	General Physics II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	4
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-Laboratory)</b>	4-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	2. Semester
<b>Examination</b>	One mid-term exam, four quizzes and end-of-term exam.
<b>Assessment</b>	Mid-term exams-30% , end of term exam-70%
<b>Description</b>	The main object of the course is to introduce fundamental concepts and principles related to the electricity and magnetism and provide an understanding of these principles with applications from the real world.
<b>Course Content</b>	Electric force and fields: Electric charge and its conservation, charged by induction and conduction, Insulators and conductors, Coulomb Law, electric field by point and distributed charged, Gauss Law. Potential energy of stable charge: the potential of point and distributed charged, potential difference, dielectrics, connection of capacitors and Energy. Direct Current: Current, power supply, Electromotor force, Resistors, energy and power, DC circuits, structure of measurement equipment, the use of electricity and safety. Magnetic force and field: Electric current in a conductor and interaction between magnetic field and moving charges, Biot-Savart Law, magnetic field produced by electric current in different type conductors, Hall Effect, magnetic properties of matter. Electromagnetic induction: Faraday's Law, Lenz's Law, Self induction, magnetic field energy, alternative current (AC) generators, electric motors, transformers.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Know fundamental concepts and principles related to the electricity and magnetism.</li> <li>2. Identify, formulate, and solve problems analytically that appear in physical systems.</li> <li>3. Analyze and resolve natural phenomenon.</li> <li>4. Associate the gained knowledge, analyze and interpret data.</li> <li>5. Apply and link the gained knowledge of natural sciences to interdisciplinary fields.</li> <li>6. Correlate and apply gained knowledge directly with technology and industry.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Halliday, D. , Resnick, R., &amp; Walker, J. (2006) 6th ed. Fundamentals of Physics. New York: John Wiley &amp; Sons, Inc.</li> <li>2. Serway, R.A. (1990). Physics for Scientists and Engineers. Philadelphia: Saunders College Publishing.</li> <li>3. Fishbane, P.M., Gasiorowicz, S., &amp; Thornton, S.T. (1996). Physics for Scientists and Engineers. Prentice Hall, Inc.</li> <li>4. Any equivalent book.</li> </ol>

## TUR 152 Turkish II : Spoken Expression

<b>Course Code</b>	TUR 152
<b>Course Title</b>	Turkish II : Spoken Expression
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(1) First
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	3
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	2. Semester
<b>Examination</b>	Mid-term exam and final exam, written form
<b>Assessment</b>	Mid-term exam-30%, final exam-70 %
<b>Description</b>	The main object of the course is to develop the students listening, reading, thinking, understanding and written expression skills.
<b>Course Content</b>	By the end of this module students will be able: 1. To read and comprehend a passage 2. To criticize a passage 3. To listen, to read, to develop the comprehension 4. To win skills and habits on effective and accurate, well arranged, writing and speaking
<b>Learning Objectives</b>	1. To read and comprehend a passage 2. To criticize a passage 3. To listen, to read, to develop the comprehension 4. To win skills and habits on effective and accurate, well arranged, writing and speaking
<b>Read List</b>	1. Prof. Dr. Enise Kantemir, Yazılı ve Sözlü Anlatım 2. Prof. Dr. Cavit Kavcar, Dr. Ferhan Oğuzkan, Özlem Aksoy, Yazılı ve Sözlü Anlatım 3. Prof. Dr. Zeynep Korkmaz, Prof. Dr. Ahmet B. Ercilasun, Prof. Dr. Hazma Zülfikar, 4. Prof. Dr. İsmail Parlatur, Prof. Dr. Mehmet Akalın, Prof. Dr. Tuncer Gülensoy, 5. Prof. Dr Necat Birinci, Türk Dili ve Kompozisyon Bilgileri

## FİZ 154 General Physics Laboratory II

<b>Code</b>	FİZ 154
<b>Course Title</b>	General Physics Laboratory II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	First
<b>Prerequisites</b>	None
<b>Local Credits</b>	1
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	0-2-0
<b>Duration</b>	1 semester
<b>Semester</b>	2. Semester
<b>Examination</b>	practices and final exam
<b>Assessment</b>	Practices30%, final-70%
<b>Description</b>	The main object of the course is to strengthen insights into the fundamental concepts of physics related to electricity, magnetism and optics through direct investigations and provide hands-on experience.
<b>Course Content</b>	Electrostatic, Ohm's law, Serial and parallel connection of resistors, the quantities which the resistivity of a material depends, Serial and parallel connection of capacitors, the relation between serial and parallel connection of batteries and brightness of lamps, Resistivity and potential difference determination using, Kirchoff circuits, potentiometer, the magnetic field produced by a current in straight wire, transformers, the sources of alternative current and electromagnetic induction, electric motor, bell and radio.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Enhance observational and analytical skills.</li> <li>2. Develop an appreciation for qualitative and quantitative reasoning.</li> <li>3. Develop physical curiosity.</li> <li>4. Develop team skills.</li> <li>5. Make measurements with common instruments.</li> <li>6. Make objective observations of physical phenomena.</li> <li>7. Draw conclusions based on observations and data.</li> <li>8. Analyze quantitative information using sketches, graphs, tables, and statistics.</li> <li>9. Conduct quantitative and qualitative discussions of observational errors.</li> <li>10. Produce a lab report.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>ARAL, E., BİLGİN, V., KILIÇ, G., İŞSEVER, G. U.</b> Fizik 1–2 Laboratuar Deney Kitabı T.C. Eskişehir Osmangazi Üniversitesi Yayınları, No:96.</li> <li>2. <b>Halliday, D. , Resnick, R., &amp; Walker, J. (2006) 6th ed.</b> Fundamentals of Physics. New York: John Wiley &amp; Sons, Inc.</li> <li>3. <b>Serway, R.A. (1990).</b> Physics for Scientists and Engineers. Philadelphia: Saunders College Publishing.</li> </ol>

## KİM154 General Chemistry Laboratory II

<b>Course Code</b>	KİM154
<b>Course Title</b>	General Chemistry Laboratory II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	First
<b>Prerequisites</b>	None
<b>Local Credits</b>	1
<b>ECTS Credits</b>	2
<b>Weekly (Lectures- Practice- Laboratory)</b>	0-2-0
<b>Duration</b>	1 semester
<b>Semester</b>	2. Semester
<b>Examination</b>	Laboratory and final exam, written form.
<b>Assessment</b>	Laboratory-60% final exam-40%
<b>Description</b>	The main aim of the course is Students are able to design and set up chemical reactions in the laboratory and teaching students how to set up a chemical reaction related to the subjects taught in the main lecture.
<b>Course Content</b>	Experiment which are parallel to the courses of science and technology teaching curriculum scheduled in 4.and 8 classes and suitable to student level. 4
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. gain the supplement knowledge to basic chemistry</li> <li>2. synthesis the knowledge on science with the content of this course</li> <li>3. analyze and estimate the data in the related scientific problem</li> <li>4. learn and distinguish the content and type of knowledge on science</li> <li>5. gain ability on research and learn scientific method</li> <li>6. gain the ability to attain balance between oral, written and applied scientific activities</li> <li>7. get professional qualification on this course and gain ability to follow the knowledge in contemporary issues</li> <li>8. apply the content of this course on current subject</li> <li>9. design and conduct experiments as well as to analyze and interpret data</li> <li>10. use techniques, skills, and modern tools necessary for practice in chemistry</li> <li>11. get information about definition, formulation and solution of problems</li> <li>12. gain ability on teamwork</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Güler,H., Saraydın,D.,Ulusoy, U.,Genel Kimya Laboratuvarı</li> <li>2. Anadolu Üniversitesi Açıköğretim Fakültesi İlköğretim Öğretmenliği Lisans Tamamlama Programı, Laboratuvar Uygulamaları ve Fen Öğretiminde Güvenlik, Cilt 3</li> </ol>

## EGB 152 Educational Psychology

<b>Course Code</b>	EGB 152
<b>Course Title</b>	Educational Psychology
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	First
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	6
<b>Weekly (Lectures-Practice-Laboratory)</b>	3-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	2. Semester
<b>Examination</b>	Mid-term exam and project, final exam
<b>Assessment</b>	Mid-term exam 35%, project 15%, final exam 50%
<b>Description</b>	The main object of the course is to know the concepts that related with education and psychology. To know development in preschool, primary school and high school level. Learning and teaching process,
<b>Course Content</b>	Education-Psychology relation, definition of Educational Psychology and it's functions, basic concepts related to psychology learning and development, developmental properties (physical, cognitive, emotional, social and ethical development), theory of learning, reflection of theory of learning to teaching process, effective learning, factors that effect learning, (motivation, individual factors, group dynamics and the effect of these factors on classroom teaching process.
<b>Learning Objectives</b>	By the end of the course students should be able to: 1. To know the concepts that related with education and psychology. 2. To know cognitive, social, physical, moral development 3. To differantiate the personal differences in learning and how learning is seen. 4. To know learning theories, learning process, personal differences in learning.
<b>Read List</b>	1. Yeşilyaprak B. (2002)Educational Psychology. Ankara: Nobel Yayın. 2. Erden,M. ve Akman,Y.(1997) Educational Psychology. Ankara: Arkadaş Yayınevi. 3. Aydın, A. (2000) Developmantal Psychology and Learning. İstanbul: Alfa Yayıncılık. 4. Bacanlı, H. (2003) Developmantal Psychology and Learning. Ankara: Nobel Yayıncılık. 5. Senemoğlu, Nuray (1997). Developmantal Psychologyand Learning Burdur: Ertem Matbaacılık. 6. Yavuzer, H. (2000). Child Psychology. İstanbul: Remzi Kitabevi.

## III.SEMESTRE

### YDI 251 Foreign Language I

<b>Course Code</b>	YDI 251
<b>Course Title</b>	Foreign Language I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(2) Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice- Laboratory)</b>	3-0-0

<b>Duration</b>	1 Semester
<b>Semester</b>	3. Semester
<b>Examination</b>	Mid-term exam and final exam, written form
<b>Assessment</b>	Mid-term exam-30%, final exam-70 %
<b>Description</b>	The aim of the course is to enable students to teach basic grammar, speaking, writing, reading and listening knowledge of English.
<b>Course Content</b>	Nouns, adjectives, adverbs and prepositions, basic tenses, active and passive voice, conditionals, modals, gerunds and infinitives, direct and indirect speech forms, sentence structure, vocabulary of English.
<b>Learning Objectives</b>	At the end of the course, the students will be able to <ol style="list-style-type: none"> <li>1. use the basic grammar of English,</li> <li>2. use the target language in classroom,</li> <li>3. understand and respond dialogues,</li> <li>4. comprehend reading passages in English,</li> <li>5. communicate with native speakers,</li> <li>6. express themselves in written forms.</li> </ol>
<b>Resources</b>	<ol style="list-style-type: none"> <li>1. Byrage J. <b>Total English for Starter Students</b> –Pearson Longman : England</li> <li>2. Foley M &amp; Hall D. <b>Total English for starter Students</b> –Workbook Pearson Longman : England</li> <li>3. Murphy, R. (1998). <b>English Grammar in Use</b>. Cambridge</li> </ol>

## BİL251 Computer Studies I

<b>Course Code</b>	BİL251
<b>Course Title</b>	Computer Studies I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	6
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-2-0
<b>Duration</b>	1 semester
<b>Semester</b>	3. Semester
<b>Examination</b>	Mid-term exam, final exam and project , written form.
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	The main aim of the course is to introduce basic information technologies and systems and their usage in education to the students.
<b>Course Content</b>	Information technologies, basic concepts of software and hardware, operating systems, word processors, electronic table programs, data presentatiton, using internet in education, effects on social structure and place in education of information technologies, security and ethic concepts of information systems.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Learn information technologies.</li> <li>2. Understand the role of computers information technologies.</li> <li>3. Learn the computer components.</li> <li>4. Understand the working principle of computer hardware</li> <li>5. Understand how operating system works.</li> </ol>

	<ol style="list-style-type: none"> <li>6. Learn how to use operating system.</li> <li>7. Understand working principles of applications.</li> <li>8. Use Microsoft Word application.</li> <li>9. Use Microsoft Excel application.</li> <li>10. Use Microsoft Powerpoint application.</li> <li>11. Know internet resources and services.</li> <li>12. Understand the working principles of web pages.</li> <li>13. Attain to find the knowledge with keyword in internet</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Akkoyunlu, B. (2002)</b>, Öğretmenler ve Öğretmen adayları için Eğitimde İnternet kullanımı. İstanbul: BİTAV</li> <li>2. <b>Courter, G., Marquis, A.(1998)</b>, Bilgisayar Öğrenim Kılavuzu, Alfa Yayınları, İstanbul.</li> <li>3. <b>Güneş, A. (Editör)(2006)</b>, Bilgisayar I Temel Bilgisayar Becerileri, Pegem Yayınıcılık, Ankara.</li> <li>4. <b>Kalbag, A. (1997)</b>, Dünyayı Saran Ağ: WWW, Tübitak Yayınları, Ankara.</li> <li>5. <b>Doherty, G.(1998)</b>, Bilgisayarda 101 Proje, Tübitak Yayınları, Ankara.</li> <li>6. <b>Kalbag, A. (1998)</b>, Bilgisayardaki Adresiniz: Web sitesi, Tübitak Yayınları, Ankara.</li> <li>7. <b>Stephens, M., Treays, R. (1998)</b>, Bilgisayarlar, Tübitak Yayınları, Ankara.</li> <li>8. <b>Wingate, P.(1997)</b>, İnternet, Tübitak Yayınları, Ankara.</li> <li>9. <b>Bal, H.Ç., (2005)</b>, Bilgisayar ve İnternet</li> </ol>

## BİY 251 General Biology I

<b>Course Code</b>	BİY 251
<b>Course Title</b>	General Biology I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(2) Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	4
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	4-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	3. Semester
<b>Examination</b>	One mid-term exam and final exam, written form
<b>Assessment</b>	Mid-term exam-40%, final exam-60%
<b>Description</b>	The main aim of this course is: explaining to science and scientific method; learning to main concepts and principles of Biology; exposing to general characteristics of living things and their differences from nonliving things; explaining to main structure and elements of living things and biochemical reactions; describing cell and its structure; introducing to different types of cell and issues; learning to biology of plants and animals.
<b>Course Content</b>	Description of biology, areas, importance, effect effect on our life and a short glance to the historical development of biology, classification and diversity of living things. Importance branches of biology, classification and diversity of living things, Living and lifeless structure. The living science: Viruses, Bacteria(Archae and eubacteria), Eucarya (Protozoa, Fungi, Plants, Animals). Species concept and taxonomical structures. Viruses.Monera. Protista, Fungi. Plant structure and features, Basic unit of living: Cell, Cell structure and function, Cell membrane, cytoplasm,organel. Nucleus, Cell reproduction; Mitosis, Meiosis and, uncontrolled cell reproduction. Tissues: Plant tissues; meristem tissue, stable tissue. Plant organs and structure, vegetative organs, generative organs, Reproduction, fertilization and growth in without flowers and flowering plants. Classification of animals: similarity and dissimilarity.

<b>Learning Objectives</b>	<p>By the end of this module students will:</p> <ol style="list-style-type: none"> <li>1. be able to comment on biological events scientifically</li> <li>2. be able to know basic biological concepts and principles</li> <li>3. be able to distinguish living things from nonliving things</li> <li>4. be able to understand biochemical events in organisms</li> <li>5. be able to recognize cell and its different types</li> <li>6. be able to distinguish plants and animals each other</li> <li>7. be able to identify different tissues and organ systems</li> <li>8. be able to comprehend the functions of organ systems</li> <li>9. be able to perceive different organism types.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Şahin, Y. (2005). Yaşambilim. İstanbul: Bilim Teknik Yayınevi.</li> <li>2. Campbell&amp;Reece (2006). Biyoloji. Çeviri Editörleri: Prof.Dr. Ertunç Gündüz, Prof.Dr. Ali Demirsoy, Prof.Dr. İsmail Türkan</li> <li>3. İlhan S, (2007) Genel Mikrobiyoloji Ders Notları</li> <li>4. Demirsoy,A. (1997). Yaşamın Temel Kuralları (Genel Biyoloji-Genel Zooloji). Ankara:Meteksan A.Ş.</li> <li>5. Keeton, W. &amp; Gould, J. (1999). Genel Biyoloji 1 (Çeviri), Ankara: Palme Yayıncılık</li> <li>6. Mader, S. (1996). Biology</li> </ol>

## BİY 253 General Biology Laboratory I

<b>Course Code</b>	BİY 253
<b>Course Title</b>	General Biology Laboratory I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	1
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	0-2-0
<b>Duration</b>	1 semester
<b>Semester</b>	3. Semester
<b>Examination</b>	practices and final exam.
<b>Assessment</b>	practices-30%, final-70%
<b>Description</b>	
<b>Course Content</b>	Basic laboratory usage technics, laboratory security precautions, introduction of light microscope, utilization, examination of cell structure. observation of osmosis and diffusion, examination and comparison of plant and animal cells, examination of cell reproduction and stages, examination of plant and animal tissues, examination of plant growth stages. Examination of flowering plants.
<b>Learning Objectives</b>	<p>By the end of this module students will :</p> <ol style="list-style-type: none"> <li>1. be able to perceive using of microscope</li> <li>2. be able to understand differences between cells of plant and animal.</li> <li>3. be able to recognize of cell reproduction and stages</li> <li>4. be able to investigate of animal and plant tissues</li> </ol>
<b>Read List</b>	1. Kılıç A., 2000, Genel Biyoloji Laboratuvarı

## KİM 251 General Chemistry III (Analytical Chemistry)

<b>Course Code</b>	KİM 251
<b>Course Title</b>	General Chemistry III (Analytical Chemistry)
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(2) Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-2-0
<b>Duration</b>	1 Semester
<b>Semester</b>	3. Semester
<b>Examination</b>	Mid-term exam and final exam, written form.
<b>Assessment</b>	Mid-term exam 30%, final exam 70%
<b>Description</b>	To give the ability of performing titrimetric and gravimetric analysis to students
<b>Course Content</b>	Description and purpose of analytical chemistry, methods for the identification of qualitative and quantitative analysis, solutions, solvents, solubility, solution of concentrations, important chemical reactions for analytical chemistry: precipitation, neutralization, complex, redox. Chemical equilibrium, homogen and heterogen of equilibrium reaction, Acids and bases, weak acids and weak bases, strong acids and strong bases, monoacid-monobase, polyfunctional acids, pH and pOH, acids and bases of equilibras, buffer solutions. Quantitative analysis: gravimetric analysis, titrimetry analysis, nonaqueas media titrations, complexometric analysis, the errors on chemical analysis, methods of instrumental analysis.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Gain the supplement knowledge to basic chemistry</li> <li>2. Synthesis the knowledge on science with the content of this course</li> <li>3. Analyze and estimate the data in the related scientific problem</li> <li>4. Learn and distinguish the content and type of knowledge on science</li> <li>5. Gain ability on research and learn scientific method</li> <li>6. Gain the ability to attain balance between oral, written and applied scientific activities</li> <li>7. Get professional qualification on this course and gain ability to follow the knowledge in contemporary issues</li> <li>8. Apply the content of this course on current subject</li> <li>9. Design and conduct experiments as well as to analyze and interpret data</li> <li>10. Use techniques, skills, and modern tools necessary for practice in chemistry</li> <li>11. Get information about definition, formulation and solution of problems</li> <li>12. Gain ability on teamwork</li> </ol>
<b>Read List</b>	Ç. Ed. SOMER, G. Analitik Kimya, , Gazi Büro Kitabevi, Ankara GÜNDÜZ, T. (1989) Kalitatif Analiz Ders Kitabı, , Bilge Yayıncılık, Ankara Skoog, D.A., West, D.M., Holler , F.J. (1996) Fundamentals of Analytical Chemistry

## EGB 255 Principles and Methods of Teaching

<b>Course Code</b>	EGB 255
<b>Course Title</b>	Principles and Methods of Teaching
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-Laboratory)</b>	3-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	3. Semester
<b>Examination</b>	One mid-term exam and final exam
<b>Assessment</b>	Mid-term exam-40%, final exam-60%
<b>Description</b>	
<b>Course Content</b>	Basic concepts related to teaching, principles of learning and teaching, importance and benefits of planned study in teaching, planning of teaching (unit annual plan, daily plan and samples of activity), strategies of learning and teaching, teaching techniques and methods and their relation with practice, teaching tools and materials, duty and responsibility of teacher to improve the quality of teaching training, proficiency of teacher
<b>Learning Objectives</b>	
<b>Read List</b>	

## FİZ 255 General Physics Laboratory III

<b>Course Code</b>	FİZ 255
<b>Course Title</b>	General Physics Laboratory III
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	1
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Credit)</b>	0-2-0
<b>Duration</b>	1 Semester
<b>Semester</b>	3. Semester
<b>Examination</b>	Mid-term exam, final exam and project , written form.
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	The main object of the course is to strengthen insights into the fundamental concepts of physics related to heat and optic through direct investigations and provide hands-on experience
<b>Course Content</b>	Mechanical equivalent of calorie, obtain of thermal expansion coefficient and thermal conduction of solids, Reflection laws and the properties of image formed by surface mirror, formation of images by concave and convex mirror and properties of image, formation of

	image by converging (thin) and diverging (thick) lenses, the travel of speed while it changes medium and light prism, interference produced by double slit, resonance, interference of water waves and Doppler effect, formation and propagation of sound, absorption of sound, reflection of sound and formation of echo. To enrich these subjects with examples from daily life and to connect with science and technology teaching curriculum scheduled in 4.and 8 classes
<b>Learning Outcomes</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Understand thermodynamics and optics quantities,</li> <li>2. Identify, formulate, and solve problems analytically that appear in optical systems.</li> <li>3. Analyze and resolve natural and artificial radioactive phenomenon.</li> <li>4. Associate the gained knowledge, analyze and interpret data.</li> <li>5. Apply and link the gained knowledge of natural sciences to interdisciplinary fields.</li> <li>6. Correlate and apply gained knowledge directly with technology and industry</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Korkmaz, Ş., Fizik-Fizik Optik- Geometrik Optik (2005)</b>, Eskişehir</li> <li>2. <b>Aral, E., Korkmaz, Ş., Sarpün, İ. H., Kurtaran, S., Kılıç, G., (1998) Fizik III (Optik) Deneyleri</b> ,</li> <li>3. <b>Halliday, D. &amp; Resnick, R. (2002). Çeviri Editörü: Yalçın, C. Fiziğin Temelleri.</b> Ankara: Arkadaş Yayınevi.</li> <li>4. <b>Serway, R.A. (1990). Çeviri Editörü: Çolakoğlu, K. Fen ve Mühendislik için Fizik.</b> Ankara: Palme Yayıncılık.</li> </ol>

#### IV.SEMESTRE

#### KİM 252 General Chemistry IV (Organic Chemistry)

<b>Code</b>	KİM 252
<b>Course Title</b>	General Chemistry IV (Organic Chemistry)
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(2) Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	4. Semester
<b>Examination</b>	Mid-term exam and final exam.
<b>Assessment</b>	Mid-term exam-30%,final exam70%
<b>Description</b>	The main aim of the course, Teaching of Organic Chemistry and Biochemistry which are from the main sections of General Chemistry has been objected.
<b>Course Content</b>	Introduction to organic chemistry: atomic orbitals, chemical bonds, bond energy, bond distance, dipoles and electronegativity. Basic concept on organic chemistry : molecular formula, constitutional formula, isomer, radical concept, organic molecules: writing and determination of molecular formula. Alkanes, molecular structures, their nomenclature, their reactions and features. Alkenes, alkynes: molecular structures, their nomenclature, their reactions and features. Aldehydes and ketones: molecular structures, their nomenclature, their reactions and features. Carboxylic acids: molecular structures, their nomenclature, their reactions and features. Amides: molecular structures, their nomenclature, their reactions and features. Lipids, proteins, structure of DNA, polymers.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. gain the supplement knowledge to basic chemistry.</li> <li>2. synthesis the knowledge on science with the content of this course.</li> </ol>

	<ol style="list-style-type: none"> <li>3. analyze and estimate the data in the related scientific problem.</li> <li>4. learn and distinguish the content and type of knowledge on science.</li> <li>5. gain ability on research and learn scientific method.</li> <li>6. gain the ability to attain balance between oral, written and applied scientific activities.</li> <li>7. get professional qualification on this course and gain ability to follow the knowledge in contemporary issues.</li> <li>8. apply the content of this course on current subject.</li> <li>9. get information about definition, formulation and solution of problems.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Petrucci , Harwood (ÇEVİREN:Tahsin Uyar) (1994) ANKARA, Genel kimya 2.</b></li> <li>2. <b>Pine, H (1987), Organic chemistry</b></li> </ol>

## BİY 252 General Biology II

<b>Course Code</b>	BİY 252
<b>Course Title</b>	General Biology II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(2) Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	4
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	4-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	4. Semester
<b>Examination</b>	Mid-term exam and final exam, written form
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	The main aim of this course is: explaining how to transport substances and energy in living organisms; learning to events of reproduction, growth and development of plants and animals; explaining to how plants and animals do their biological activities.
<b>Course Content</b>	Energy exchange with the environment, energy transport systems in living things, cellular respiration, photosynthesis and comparison with respiration, Animal tissues and structure: tissue diversity, functions and working properties. Reproduction in animals, fertilization and development: Importance of reproduction, fertilization types, embryologic development stages, Nutrition and digestion in animals; Respiratory system in animals, Excretory system in animals. circulatory system in animals, Nervous system in animals, animal organization and homeostasis.
<b>Learning Objectives</b>	<p>By the end of this module students will:</p> <ol style="list-style-type: none"> <li>1. be able to comment on substance and energy cyclus in living things</li> <li>2. be able to perceive similarities and differences between biological activities of plants and animals.</li> <li>3. be able to explain metabolic periods of plants</li> <li>4. be able to understand reproductive and developmental periods of plants and animals</li> <li>5. be able to know organ systems of animals and their physiology</li> <li>6. be able to recognize to body and organ systems of human beings.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Şahin, Y. (2005). Yaşambilim. İstanbul: Bilim Teknik Yayınevi.</li> <li>2. Campbell&amp;Reece (2006). Biyoloji. Çeviri Editörleri: Prof.Dr. Ertunç Gündüz, Prof.Dr. Ali Demirsoy, Prof.Dr. İsmail Türkan</li> <li>3. Yel, M., Bahçeci, Z. &amp; Yılmaz, M. (2004). Canlılar Bilimi (Biyolojiye Giriş).Ankara: Gündüz Eğt. Ve Yayıncılık.</li> <li>4. Keeton, W. &amp; Gould, J. (1999). Genel Biyoloji 1 (Çeviri), Ankara: Palme Yayıncılık</li> <li>5. Demirsoy,A. (1997). Yaşamın Temel Kuralları (Genel Biyoloji-Genel Zooloji). Ankara:Meteksan A.Ş.</li> <li>6. Mader, S. (1996). Biology.</li> </ol>

## YDI 252 Foreign Language II

<b>Course Code</b>	YDI 252
<b>Course Title</b>	Foreign Language II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(2) Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-Laboratory)</b>	3-0-0
<b>Duration</b>	1 Semester
<b>Semester</b>	4. Semester
<b>Examination</b>	Mid-term exam and final exam, written form
<b>Assessment</b>	Mid-term exam-30%, final exam-70 %
<b>Description</b>	The aim of the course is to enable students to teach basic grammar, speaking, writing, reading and listening knowledge of English.
<b>Course Content</b>	This course has been designed to improve the reading, speaking, writing and listening skill of students in their academic activities. In this course, the aim should be improve the knowledge and skills of student gained in foreign language I course. For this purpose, interesting context should be created, to improve the using of foreign language the practices should be given, the use of language in real communication skills should be showed and the oral and communicational skills of student and the proficiency of foreign language are improved.
<b>Learning Objectives</b>	At the end of the course, the students will be able to <ol style="list-style-type: none"> <li>1. use the basic grammar of English,</li> <li>2. use the target language in classroom,</li> <li>3. understand and respond dialogues,</li> <li>4. comprehend reading passages in English,</li> <li>5. communicate with native speakers,</li> <li>6. express themselves in written forms.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Walker,E. &amp; Elsworth, S. (2000). <b>New Grammar Practice for Elementary Students</b> –Longman: England</li> <li>2. Walker,E. &amp; Elsworth, S. (2000). <b>New Grammar Practice for Pre-Intermediate Students</b> –Longman : England 2.</li> <li>3. Murphy, R. (1998). <b>English Grammar in Use</b>. Cambridge.</li> <li>4. <b>Dictionary of Contemporary English</b>, Longman.</li> </ol>

## FİZ 254 Introduction to Modern Physics

<b>Course Code</b>	FİZ 254
<b>Course Title</b>	Introduction to Modern Physics
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2

<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	4. Semester
<b>Examination</b>	One mid-term exam, final exam
<b>Assessment</b>	Mid-term exam-30%, final exam760%
<b>Description</b>	The main object of the course is to give fundamental concepts about Modern Physics
<b>Course Content</b>	The structure of atom: Atom models, energy levels, atomic and molecular spectrums. Relativity: relativity of time, dimension and mass. Photons: Quantum concept, Black body radiation, Photoelectric effect and Compton scattering. Quantum mechanics: wave-photon dilemma, De Broglie waves, Uncertainty principle, Schrödinger wave.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Identify, formulate, and solve problems analytically that appear in physical systems.</li> <li>2. Analyze and resolve natural phenomenon.</li> <li>3. Associate the gained knowledge, analyze and interpret data.</li> <li>4. Apply and link the gained knowledge of natural sciences to interdisciplinary fields.</li> <li>5. Correlate and apply gained knowledge directly with technology and industry</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Özemre, A.Y., (1983) Çağdaş Fiziğe Giriş</b>, İ.Ü. Yayınları</li> <li>2. <b>Serway, R.A. (1990)</b>. Physics for Scientists and Engineers, Vol. III, Philadelphia: Saunders College Publishing.</li> <li>3. <b>Fishbane, P.M., Gasiorowicz, S., &amp; Thornton, S.T. (1996)</b>. Physics for Scientists and Engineers, Vol. II, Prentice Hall, Inc.</li> <li>4. Any equivalent book.</li> </ol>

## BİY 254 General Biology Laboratory II

<b>Course Code</b>	BİY 254
<b>Course Title</b>	General Biology Laboratory II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	1
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	0-2-0
<b>Duration</b>	1 semester
<b>Semester</b>	4. Semester
<b>Examination</b>	Practice and final exam, written form
<b>Assessment</b>	Practice-40%, final exam-60%
<b>Description</b>	
<b>Course Content</b>	Examination of photosynthesis in plant. Examination of single cell living things and tissues. Cultivation of living things in laboratory. Examination of embriological development stages in living things (frog, chick), Observation of respiration in living things, Examination of blood cells, determination of blood groups. Determination of carbohydrate, fat, protein in foods
<b>Learning Objectives</b>	By the end of this module students will: <ol style="list-style-type: none"> <li>1. be able to observe of photosynthesis in plant</li> <li>2. be able to investigate of single cell living things</li> </ol>

	<ol style="list-style-type: none"> <li>3. be able to observe respiration in living things</li> <li>4. be able to perceive determination of blood groups</li> <li>5. be able to make determination of carbohydrate, fat, protein in foods</li> </ol>
<b>Read List</b>	1. <b>Kılıç A.</b> , 2000, Genel Biyoloji Laboratuvarı

## FEN 252 Science-Technology Program and Planning

<b>Course Code</b>	FEN 252
<b>Course Title</b>	Science-Technology Program and Planning
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-Laboratory)</b>	3-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	4. Semester
<b>Examination</b>	One mid-term exam, final exam
<b>Assessment</b>	Mid-term exam-30% , final exam-70%
<b>Description</b>	
<b>Course Content</b>	<p>Definition of teaching curriculum, principle of curriculum development, basic approaches in curriculum development, curriculum development process, difference between curriculum development and curriculum organization, development of teaching curriculum of elementary science and technology and its components, planning of science teaching, course curriculum, the planning of course activities; preparation and examination of lecture, daily and unit annual plan, general teaching principles, methods and techniques.</p> <p>To enrich these subjects with examples from daily life and to connect with science and technology teaching curriculum scheduled in 4.and 8 classes.</p>
<b>Learning Objectives</b>	
<b>Read List</b>	

## BİL 252 Computer Studies II

<b>Course Code</b>	BİL 252
<b>Course Title</b>	Computer Studies II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	6
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-2-0
<b>Duration</b>	2 semester

<b>Semester</b>	4. Semester
<b>Examination</b>	One mid-term exam, practices and final exam
<b>Assessment</b>	Mid-term exam-30%, practices-20%, final exam-50%
<b>Description</b>	The main object of the course is to teach the using computer and its related technology in Science education.
<b>Course Content</b>	Basic concepts related to computer aided education, components, theoretical principles, benefits and limits, application methods, common formats used in computer aided education, the selection and evaluation of course software, distance learning applications, data base applications, the negative effect of computers and internet on children/teenagers and prevent from it.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. improve their computer skills and information technology.</li> <li>2. learn internet using in science education</li> <li>3. manage numerical calculations using the computer software.</li> <li>4. manage data analysis and simulation using the computer software.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Akkoyunlu, B.</b> (2002). Öğretmenler ve Öğretmen adayları için Eğitimde İnternet kullanımı. İstanbul: BİTAV</li> <li>2. <b>Courter, G., &amp; Marquis, A.</b>(1998). Bilgisayar Öğretim Kılavuzu. İstanbul: Alfa</li> <li>3. <b>Kalbag, A.</b> (1997). Dünyayı Saran Ağ: WWW. Ankara: TÜBİTAK</li> <li>4. <b>Doherty, G.</b>(1998). Bilgisayarda 101 Proje. Ankara: TÜBİTAK</li> <li>5. <b>Kalbag, A.</b> (1998). Bilgisayardaki Adresiniz: Web sitesi. Ankara: TÜBİTAK</li> <li>6. <b>Stephens, M.,&amp; Treays, R.</b>(1998).Bilgisayarlar. Ankara: TÜBİTAK</li> <li>7. <b>Wingate, P.</b>(1997). İnternet. Ankara: TÜBİTAK</li> <li>8. <b>Hasan Ç. (Bal. 2005).</b>Bilgisayar ve İnternet</li> <li>9. The Mathematica Book, Fourth Edition by <u>Stephen Wolfram</u>, Cambridge University Press; 1999</li> <li>10. Numerical Computing with MATLAB, by Cleve Moler, published by Society for Industrial and Applied Mathematics</li> <li>11. İnternet</li> </ol>

## V.YARIYIL

### FEN 353 Instructional Technology and Material Development

<b>Course Code</b>	FEN 353
<b>Course Title</b>	Instructional Technology and Material Development
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(3) Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	6
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-2-0
<b>Duration</b>	1 Semester
<b>Semester</b>	5. Semester
<b>Examination</b>	Mid-term exam and final exam, written form
<b>Assessment</b>	Mid-term exam -30%, and preparation materials -70%
<b>Description</b>	Various features of Instructional Technology the location and use of teaching process development of teaching materials (worksheets, transparencies, slides, video, computer-based instructional material) development and evaluation of materials in various qualities.
<b>Course Content</b>	Some concepts related to instructional technology; properties of different instructional technology, place and using of instructional technology in teaching process, the determination of technological needs of school or classrooms, making of suitable technology plan and its practice, material development via instructional technology, the development of teaching tools (work sheets, activity design, overhead transparent, slides, visual aids (VCD, DVD, computer based tools), examination of educational software,

	evaluation of teaching tool with different quality, Internet and distance learning, principle of visual design, the investigation of activities of teaching materials, the using of teaching materials in Türkiye and on the world
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Basic concepts of the teaching technology and improve of material</li> <li>2. Basic necessity for the teaching technology and improve of material</li> <li>3. Dimension of teaching technology</li> <li>4. New forms of teaching technology</li> <li>5. Basic principle and philosophy of education technology</li> <li>6. Basic principle and philosophy of new technology</li> <li>7. Theoretical principles of the learning and teaching process</li> <li>8. Teaching exercise based on technology</li> <li>9. To improve material</li> <li>10. To use material</li> <li>11. To prepare of learning and teaching situation in primary education</li> <li>12. Quality of teacher in use of technology</li> <li>13. To prepare of learning and teaching situation in primary education</li> <li>14. Evaluating of material and tecnologys.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Özcan, Demirel, Esed Yağcı, Sadi Seferoğlu (1998). Öğretim Teknolojileri ve Materyal Geliştirme. Pegem Yayıncılık.</li> <li>2. Çilenti, Kamuran (1998). Eğitim Teknolojileri ve Öğretim. Ankara: Pegem Yayıncılık.</li> <li>3. Alkan, Cevat (1998). Eğitim Teknolojileri. Ankara: Pegem Yayıncılık.</li> </ol>

## FEN 355 Scientific Resesarch Methods

<b>Course Code</b>	FEN 355
<b>Course Title</b>	Scientific Resesarch Methods
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Second
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	5. Semester
<b>Examination</b>	One mid-term exam, Project, final exam
<b>Assessment</b>	Mid-term exam-30%, project % 30, final exam-40%
<b>Description</b>	Knowing basic concepts of science and scientific methods
<b>Course Content</b>	Science and basic concepts (phenomena, knowledge, right, wrong and absolute knowledge), principle knowledge of science history, structure of scientific research, scientific methods and different aspects to scientific methods, problem, research model, population and sampling, collecting data and data collection methods (Qualitative and Quantitative data colecection methods), recording, analising, interpreting and reporting data.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Knowing basic concepts of science and scientific methods</li> <li>2. Learning different aspects of scientific methods</li> <li>3. Understanding scientific research methods</li> <li>4. Improving the ability of doing scientific research</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Karasar, N. (2003). <i>Bilimsel Araştırma Yöntemi</i> (12. Basım), Ankara: Nobel Yayıncılık.</li> <li>2. Yıldırım A. ve Şimşek H. (2005). <i>Sosyal Bilimlerde Nitel araştırma Yöntemleri</i>, Ankara: Seçkin yayıncılık.</li> <li>3. Lodico, M. G., Spauldind, D. T. Ve Voegtle, K. H. (2006). <i>Methods in Educational Research from Theory to Practice</i>, San Francisco, CA: Wiley İmprint.</li> </ol>

## FEN 357 Science Teaching Laboratory Practice I

<b>Course Code</b>	FEN 357
<b>Course Title</b>	Science Teaching Laboratory Practice I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(3) Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-2-0
<b>Duration</b>	1 Semester
<b>Semester</b>	5. Semester
<b>Examination</b>	1 Mid-term exam Final exam
<b>Assessment</b>	1 Mid-term exam-% 30, Final exam-% 070
<b>Description</b>	The aim of the Science-Knowledge lesson is introducing the materials and equipments of the primary education 6-8. classes and explaining the science-experiments which are become from this materials and equipments. In this case student acquires self-confidence and practice his or her occupational experience. On the other hand getting the maximum efficiency from the science-practising lesson is very important.
<b>Course Content</b>	Explaining how to use the cyclops and slide projector, the cell and activities which are happening in the cell, using microscope, investigating plant cell and animal cell with microscope, photo synthesis and respiration experiments, investigating plant root, body, leaf and flower in laboratory, investigating animals which have only one cell, human eye and its model, investigating human body, heat and temperature, melting and freezing experiments, boiling and evaporation experiments, separating compounds and experiments, electrolysis and experiments.
<b>Learning Objectives</b>	<ol style="list-style-type: none"> <li>1. Apply knowledge of basic mathematics</li> <li>2. Conduct applications as well as to analyze and interpret data</li> <li>3. Function on multi-disciplinary</li> <li>4. Identify, formulate, and solve mathematical problems</li> <li>5. Communicate effectively</li> <li>6. Understand the broad education necessary to understand the impact of mathematical solutions in a global and societal context</li> <li>7. Get a recognition of the need for, and an ability to engage in life-long learning</li> <li>8. Gain a knowledge of contemporary issues</li> <li>9. Explaining and teaching science materials and tools</li> <li>10. Teaching the materials of experiments and observations</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1-Ekem N., Ütenler E., Balbağ Z., Anılan B., Görgülü A. Science-Knowledge 2 Experiment Book, Eskişehir Osmangazi University Education Faculty</li> <li>2-Primary Education 6-8. Classes Science-Knowledge Book's and CD Set's</li> <li>3-Source book for science teaching, Unesco</li> </ol>

## FİZ 351 Special Topics in Physics

<b>Course Code</b>	FİZ 351
<b>Course Title</b>	Special Topics in Physics
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	2

<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	5. Semester
<b>Examination</b>	One mid-term exam, final exam, written form
<b>Assessment</b>	Mid-term exam-40%, final exam-60%
<b>Description</b>	The main object of the course is to show the industrial and scientific application of physics
<b>Course Content</b>	Semiconductors: Diode, transistor, solar cells and the field of its usage, lasers. Superconductivity and the field of its usage. X-Rays: Structure, the use in chemical analysis and quality control. The instrument of communication technology: Computers and its components, Integrated circuits, fiber optics, different physical sensors (optics, thermal, pressurized, electrical, magnetic based) Integrated circuits, Numerical (digital) systems, Nanotechnology. Visualization techniques and instruments: Ultrasound, Nuclear Magnetic Resonance, Tomography, Scintigraphy, Electron and scanning electron microscope.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. learn application and using of physics in industry.</li> <li>2. Apply and link the gained knowledge of natural sciences to interdisciplinary fields.</li> <li>3. Correlate and apply gained knowledge directly with technology and industry.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Bueche, F., (1981)</b> Technical Physics, Harper&amp;Row, Publishers, NewYork</li> <li>2. <b>Serway, R.A. (1990)</b>. Physics for Scientists and Engineers, Vol. III, Philadelphia: Saunders College Publishing.</li> <li>3. <b>Fishbane, P.M., Gasiorowicz, S., &amp; Thornton, S.T. (1996)</b>. Physics for Scientists and Engineers, Vol. II, Prentice Hall, Inc.</li> <li>4. Any equivalent book.</li> </ol>

## KİM 351 Special Topics in Chemistry

<b>Course Code</b>	KİM 351
<b>Course Title</b>	Special Topics in Chemistry
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	5. Semester
<b>Examination</b>	Mid-term exam and final exam
<b>Assessment</b>	Mid-term exam-30%, final exam-70 %
<b>Description</b>	Fields of chemistry learning of us.
<b>Course Content</b>	Air pollution (acid rains, prevention and fog pollution). Chemical regard to health and food. Enthalpy sources of the world. Greenhouse gases and importance. Drinking water to river water. Glasses and ceramics. Relation of chemistry and visual art. Photography chemistry. Corrosion chemistry and importance. Biological process and equilibrium. Medicine treatment and chemistry (blood chemistry). Chemical cleaning materials and correct using Matter with carbon. Chemistry on the living process, environmental and environmental. Chemical pollution, nuclear energy.
<b>Learning Objectives</b>	Fields of chemistry learning of us.
<b>Read List</b>	Çeviri Editörü Prof. Dr. Tahsin UYAR Genel kimya Temel kavramlar cilt 1-2 Palme yayıncılık 1993 ANKARA

## BİY 351 Human Anatomy And Physiology

<b>Course Code</b>	BİY 351
<b>Course Title</b>	Human Anatomy And Physiology
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	5. Semester
<b>Examination</b>	One mid-term exam, final exam, written form
<b>Assessment</b>	Mid-term exam-40%,home work 10% final exam-50%
<b>Description</b>	
<b>Course Content</b>	Description of anatomy and physiology, organ systems: nutrition and metabolism, digestion system, circulatory system, excretory system, respiratory system, female reproduction system and menstruation circle, male reproduction system, fertilization and embryologic development stages, musculoskeletal system, endocrine system,nervous system and sense organs.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Learn system structure and functions</li> <li>2. Learn system definition and concept</li> <li>3. Understand human body organization</li> <li>4. Understand the homeostatic equilibrium between systems.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. İnsan Anatomisi ve Fizyolojisine Giriş, Eldra Pearl Solomon, Çeviri: Prof.Dr. L.Bikem Süzen, 2001.</li> <li>2. Canlılar Bilimi, Prof.Dr. Mustafa Yel, Prof.Dr. Zafer Bahçeci, Yrd. Doç. Mehmet Yılmaz, 2004.</li> <li>3. Aktümsek A.,2004, Anatomi ve Fizyoloji: İnsan Biyolojisi,</li> <li>4. Histoloji, Prof.Dr. Şermin Paker, 1993.</li> <li>5. Biology, Sylvia S. Mader, 1990</li> </ol>

## EGB 355 History of Turkish Education

<b>Course Code</b>	EGB 355
<b>Course Title</b>	History of Turkish Education
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	5. Semester
<b>Examination</b>	Mid-term exam and final exam,
<b>Assessment</b>	Mid-term exam 30%, %, final exam 70 %

<b>Description</b>	
<b>Course Content</b>	Importance of Turkish History of education in point of education fact. Educational situation before Republic of Turkiye and institutes for teacher education. Turkish educational revolution I: Historical development of revolution, philosophical, and political base. Turkish educational revolution II: Unification of education (Tevhid-i Tedrisat Law): historical base, scope, application and importance; Secularism in Turkish education system. Turkish educational revolution III: Mixed education (coed) and education of girls, Letters revolution, public schools, public homes. Basic principles of education system of Turkish Republic, Village Institutes, Institute of Education, Teacher High Schools. University and teacher education the development of Turkish education in near period.
<b>Learning Objectives</b>	
<b>Read List</b>	

## MAT 363 Statistics

<b>Course Code</b>	MAT 363
<b>Course Title</b>	Statistics
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	5. Semester
<b>Examination</b>	One mid-term exam, final exam
<b>Assessment</b>	Mid-term exam 30%, final exam 70%
<b>Description</b>	To enable students to understand and apply basic concepts and principles of descriptive and inferential statistics with emphasis on basic computation and interpretation of statistical procedures.
<b>Course Content</b>	Introduction to statistic and basic concepts of statistics; descriptive statistics (central collapse-distribution scales), universe parameters (standard errors, standard deviation and interval of confident); Correlation and alternative Correlation techniques, Hypothesis testing, decision; difference testing; chi-square testing; scale development process; standardization and adaptation images, data analysis with package computer programs and alternative programs
<b>Learning Objectives</b>	By the end of this module students will be able to: 1. acquire basic knowledge about descriptive and inferential statistical techniques and their use 2. identify the most appropriate statistical technique for a given research question
<b>Read List</b>	1. Aytaç, M. (1999). Matematiksel İstatistik, Ezgi Kitapevi, Bursa. 2. Bülbül, S.E. (2001). Çözümsel İstatistik, Alfa Yayınları, Ankara. 3. Akdeniz, F. (1996). Olasılık ve İstatistik, Ç.Ü.Basımevi, Adana. 4. Atlas, M. (2001). İstatistik I, Birlik Ofset, Eskişehir. 5. Çelik,C.(2006). İstatistik ve Olasılık, Basılmamış Ders Notları, Siirt

## VI.SEMESTRE

### Science Teaching Laboratory Practice II

<b>Course Code</b>	FEN 358
<b>Course Title</b>	Science Teaching Laboratory Practice II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(3) Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-2-0
<b>Duration</b>	1 Semester
<b>Semester</b>	6. Semester
<b>Examination</b>	1 Mid-term exam + 2 Short-exam + 15 Homework + 15 Laboratory(Mid-term), Final exam
<b>Assessment</b>	1 Mid-term exam-% 30, Final exam-% 70
<b>Description</b>	The aim of the Science-Knowledge lesson is introducing the materials and equipments of the primary education 6-8. classes and explaining the science-experiments which are become from this materials and equipments.In this case student acquires self-confidence and practice his or her occupational experience.On the other hand getting the maximum efficiency from the science-practising lesson is very important.
<b>Course Content</b>	Explaining how to use the cyclops and slide projector, the cell and activities which are happening in the cell, using microscope, investigating plant cell and animal cell with microscope, photo synthesis and respiration experiments, investigating plant root, body, leaf and flower in laboratory, investigating animals which have only one cell, human eye and its model, investigating human body, heat and temperature, melting and freezing experiments, boiling and evaporation experiments, separating compounds and experiments, electrolysis and experiments
<b>Learning Objectives</b>	<ol style="list-style-type: none"> <li>1. Apply knowledge of basic mathematics</li> <li>2. Conduct applications as well as to analyze and interpret data</li> <li>3. Function on multi-disciplinary</li> <li>4. Identify, formulate, and solve mathematical problems</li> <li>5. Communicate effectively</li> <li>6. Understand the broad education necessary to understand the impact of mathematical solutions in a global and societal context</li> <li>7. Get a recognition of the need for, and an ability to engage in life-long learning</li> <li>8. Gain a knowledge of contemporary issues</li> <li>9. Explaining and teaching science materials and tools</li> <li>10. Using SHCE(education which is consisted from seeing and hearing) materials</li> <li>11. Teaching the materials of experiments and observations</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Prof.Dr.EKEM N., Inst.Of.ÜTENLER E.,İnv.Of. BALBAĞ Z.-ANILAN B.-GÖRGÜLÜ A. Scince-Knowledge 2 Experiment Book, Eskişehir Osmangazi University Education Faculty</li> <li>2. Primary Education 6-8.Classes Scince-Knowledge Book's and CD Set's</li> <li>3. Source book for science teaching, Unesco</li> </ol>

## Special Teaching Methods I

<b>Course Code</b>	FEN 356
<b>Course Title</b>	Special Teaching Methods I
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(3) Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-2-0
<b>Duration</b>	1 Semester
<b>Semester</b>	6. Semester
<b>Examination</b>	Mid-term exam and end-of-term exam, written form.
<b>Assessment</b>	Mid-term exam-30%, end of term exam-70%
<b>Description</b>	The main aim of the course is to treat teaching techniques in learning-teaching processes.
<b>Course Content</b>	Teaching techniques in subject areas, Learning- teaching processes, application of general teaching techniques into subject area teaching, Critical review of the text books in relation with specific teaching techniques, Micro education applications, Evaluation of the teaching processes.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Criticize the text books.</li> <li>2. Learn methods and techniques of teaching strategies and compare with each other.</li> <li>3. Apply teaching techniques into subject area.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Demirel, Ö. (2006)</b> Öğretme sanatı, Pegama Yayınları, Ankara.</li> <li>2. <b>Demirel, Ö. (1996)</b> Genel öğretim yöntemleri, Usem Yayınları, Ankara.</li> <li>3. <b>Küçükahmet, L. (2002)</b> Öğretimde planlama ve değerlendirme, Nobel Kitabevi, Ankara</li> <li>4. <b>Doğanay, A., Karip, E., (2006)</b> Öğretimde planlama ve değerlendirme, Pegama Yayınları, Ankara</li> <li>5. <b>Soylu, H., (2004)</b> Fen öğretiminde yeni yaklaşımlar, Nobel Yayınları, Ankara</li> </ol>

## Special Teaching Methods I

<b>Course Code</b>	FEN 360
<b>Course Title</b>	Geology
<b>Instructor's Name</b>	
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	3
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	6. Semester
<b>Examination</b>	One mid-term exam, final exam

<b>Assessment</b>	Mid-term exam-40%, final exam-60%
<b>Description</b>	The main object of the course is to teach basic concepts of geology.
<b>Course Content</b>	Subject and Definiton of geology. General information about Earth: Shape and dimension of earth, motion of earth, geosphere , temperature of inner core, gravitation and izostazi, age of earth. Composition of earth's crust: Minerals, description and properties. Important minerals which form rock: Rocks, description and general information, igneous rocks, metamorphism and metamorphic rocks, sedimentary rocks, disintegration (destruction) and soil, disintegration (destruction) types, the condition of soil formation . Tectonic motion: orogenic motions, epirogenic motions, faults, volcanoes, earthquakes. Stratigraphy: general principles, geological times.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Analyze and resolve natural phenomenon.</li> <li>2. Associate the gained knowledge interpret data.</li> <li>3. Apply and link the gained knowledge of natural sciences to interdisciplinary fields</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Heler Robert L. , Geology and earth sciences sourcebook : for elementary and secondary schools 3rd ed, <u>New York : Holt, Rinehart and Winston</u>, 1962</li> <li>2. Ketin, İ Genel Jeoloji cilt I : yerbilimlerine giriş <u>İstanbul : İstanbul Teknik Üniversitesi</u> , 1977</li> </ol>

## Social Maintenance Practice

<b>Course Code</b>	FEN 354
<b>Course Title</b>	Social Maintenance Practice
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	1-2-0
<b>Duration</b>	1 semester
<b>Semester</b>	6. Semester
<b>Examination</b>	One mid-term exam, final exam
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	
<b>Course Content</b>	Importance of social maintenance, to determine the daily problems of society and to prepare the project to solve them, to attend scientific activities like panel, conference, symposium as audience, speaker or organizer, to be voluntary in the different projects in the frame of social responsibility, to gain basic knowledge and skills to be able to apply the social maintenance in the schools.
<b>Learning Objectives</b>	
<b>Read List</b>	

## Genetic and Biotechnology

<b>Course Code</b>	BİY 352
<b>Course Title</b>	Genetic and Biotechnology
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	6. Semester
<b>Examination</b>	Mid-term exam and final exam, written form
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	The main aim of the course is to learn genetic and biotechnology
<b>Course Content</b>	Description of genetic and biotechnology, areas, importance, effect of our life and historical evolution.. Origin of modern genetic science. Mendel's theory, crosses, cytoplasmic heredity, natural selection, Adaptation, Mutations. Molecular Biology, Gene technology: Molecular genetic. Human genetic and genetic diseases. Possibility of biotechnology in terms of community, science and technology. Basic principles of biotechnology: metabolism in microorganism, plant-animal cell cultures, fermentation and fermentation technologies, Basic processes in biotechnology,. Biotechnologic applications: Microbial biomass production (yeast, single cell protein), primary metabolite production (citric acid, fumaric acid, acetic acid, amino acid, vitamins, fermentations (alcoholic fermentation, lactic acid production, butyric acid, acetone), secondary metabolite production (antibiotic), enzyme production, gene biotechnology, environmental biotechnology.
<b>Learning Objectives</b>	By the end of the course students should be able to: <ol style="list-style-type: none"> <li>1. Understand the importance of genetic and biotechnology,</li> <li>2. Understand of laws of modern genetic science,</li> <li>3. Understand of molecular biology,</li> <li>4. Learn of biotechnologic applications</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Klug, W.S., Cummings, R. (2002), Genetik kavramlar, çev. ed. Öner, C., Palme yayıncılık, ISBN 975-8624-21-0.</li> <li>2. Arda M., 1995, Biyoteknoloji (Bazı Temel İlkeler), Kükem Derneği Bilimsel Yayınlar No.3.</li> <li>3. Telefoncu A., 1995, Biyoteknoloji. Ege Üniversitesi Fen Fakültesi Yayınları, No:152</li> <li>4. Temizkan, G. (1999), Genetik II. Moleküler Genetik, İstanbul Üniversitesi yayınları, sayı 4067.</li> </ol>

## Science of Environment

<b>Course Code</b>	FEN 362
<b>Course Title</b>	Science of Environment
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	3-0-0
<b>Duration</b>	1 semester

<b>Semester</b>	6. Semester
<b>Examination</b>	Mid-term exam, final exam, written form
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	The purpose of lecture is introducing environment and factors that form the necessary element for environment in which it can be lived. Learning responsibilities about environment pollution, harms and protecting environment
<b>Course Content</b>	Environment: Historical development of environmental sciences. Human and environment, population and environment, Regional and local environmental problems: Water, soil and air pollution, radioactiv pollution and other pollution resources. Biological species and situation in Turkiye: Flora and Fauna. Endemic animal and plants species in Tukiye, living species under threat, Environmental organizations and activities, environmental education, continuing development..
<b>Learning Objectives</b>	By the end of the course students should be able to: <ol style="list-style-type: none"> <li>1. be able to learn environment and historical development of environmental science.</li> <li>2. be able to know pollution resources</li> <li>3. be able to understand biological wealth in Turkiye</li> <li>4. be able to know environmental organizations and activities</li> <li>5. The role of human in environment pollution</li> <li>6. Individual necessities on environment pollution and precaution</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1- Egemen Ö., 2000, Çevre ve Su Kirliliği, Ege Üniversitesi, Su Ürünleri Fakültesi Yayınları</li> <li>2- Kocataş A., 1996,Ekoloji Çevre Biyolojisi</li> <li>3- Gündüz T., 1994, Çevre Sorunları</li> <li>4- Akman Y., 2000, Çevre Kirliliği, Çevre Biyolojisi</li> <li>5- Şahin.Y. (2002). Ekoloji. Eskişehir. Bilim Teknik Kitapevi</li> <li>6- Türkiye'nin Biyolojik Zenginlikleri 2005 , Türkiye Çevre Vakfı</li> </ol>

## Nature and History of Science

<b>Course Code</b>	
<b>Course Title</b>	Nature and History of Science
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Third
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	3-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	6. Semester
<b>Examination</b>	One mid-term exam, final exam
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	
<b>Course Content</b>	Definition of science: aims, properties, development and stages. History of science: Phylosphy of science, phylosophical trends and their effect of development of science, History of inventions. Epistemology, ontology, nature of scientific concepts, how can be reached to konowledge, scientific information and its properties. Concept of being. Scientific method: Scientific mind, Scientific questionnaire. Sscience society: sosyology and antropology of science, ethic of science.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. be able to know definition, development and stages development of science</li> <li>2. be able to know history of science</li> <li>3. be able to understand scientific method, scientific questionnaire</li> </ol>

	4. be able to connect science and society
Read List	Şahin Y., 2007, Biyolojide Geçmişe Yolculuk Palme Yayıncılık

## VII.SEMESTRE

### EGB 455 Guidance

Course Code	EGB 455
Course Title	Guidance
Academic Cycle	Bachelor
Year of Study	(4) Fourth
Prerequisites	None
Local Credits	3
ECTS Credits	5
Weekly (Lectures-Practice-Laboratory)	3-0-0
Duration	1 Semester
Semester	7. Semester
Examination	Mid-term exam and final exam, written form
Assessment	Mid-term exam-30%, final exam 70%
Description	Purpose of student personal services and the place in education, definition of guidance services, purposes and principles of guidance and counseling , description of students, to guide students, counseling, social relations, vocational guidance, special education and to define the students who have special needs.
Course Content	Student personal services and the place in education, definition of guidance services, purposes and principles of guidance and counseling , description of students, to guide students, counseling, social relations, vocational guidance, special education and to define the students who have special needs.
Learning Objectives	At the end of the course, students will be able to: 1.Skills on applying basic guidance knowledge 2.Skills on describing and applying guidance 3.Skills on coordination with guidance service 4.Skills on discriminating the students who need special education 5.Skills on discriminating the students with special problems 6.Skills on deciding the guidance activities 7.Skills on deciding the guidance activities among students' developmental needs
Read List	1- Can, G. (2002). Guidance and Counselling. Ankara: Pegema Press. 2.Yeşilyaprak, B. (2000). Guidance and counselling in Education Ankara: Nobel Press. 3. Kuzgun,Y. (2000). İlköğretimde Guidance in Elementary School .Ankara: Nobel Press. 4. Kuzgun, Y (1992). Guidance and Counselling. Ankara: ÖSYM . 5. Tan, H.(1992) Guidance and Counselling. M.E.B. Öğretmen Kitapları Dizisi, İstanbul: Milli Eğitim Basımevi.

### EGB 457 Special Education

Course Code	EGB 457
Course Title	Special Education
Academic Cycle	Bachelor
Year of Study	Fourth
Prerequisites	None

<b>Local Credits</b>	2
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	7. Semester
<b>Examination</b>	One mid-term exam, final exam
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	The special education teacher candidates to gain information about
<b>Course Content</b>	Definition of special education, basic principle related to special education, the reason of disability, the importance of early diagnosis and therapy, historical approach to disability, the characteristics and the education of children have mental disability, deafness, blindness, physical disability, who stutters, learning disability (dyslexia), attention deficiency and hyperactive, otistic and mentally gifted, the education of the children needs special education via play, respect of disabled children family, the situation of special education in Türkiye and special education institutes,
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. know the disabled child,</li> <li>2. to be able to know the reason of disability,</li> <li>3. to be able to know the characteristics of disability,</li> <li>4. and the differentiate the different disability groups</li> <li>5. to be able to educate the disabled students</li> </ol>
<b>Read List</b>	Özsoy, Y., Özyürek, M., Eripek, S. (2002) <i>Özel Eğitime Giriş : Özel Eğitime Muhtaç Çocuklar</i> . Ankara: Karatepe Yayınları. <ol style="list-style-type: none"> <li>1. Ersoy, Ö., Avcı, N. (2000). <i>Özel Gereksinimi Olan Çocuklar ve Eğitimleri</i>. Özel Eğitim. İstanbul: Ya-Pa Yayınları.</li> <li>2. Ersoy, Ö. (2003). “ Erken Çocukluk Döneminde Kaynaştırma “. Erken Çocuklukta Gelişim ve Eğitimde Yeni Yaklaşımlar. İstanbul : Morpa Kültür Yayınları.</li> </ol>

## EGB 459 Classroom Management

<b>Course Code</b>	EGB 459
<b>Course Title</b>	Classroom Management
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Fourth
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	7. Semester
<b>Examination</b>	One mid-term exam, final exam
<b>Assessment</b>	Mid-term exam-40%, final exam-60%
<b>Description</b>	To know the contemporary approaches in classroom management, to improve skills of classroom activities and educational leadership. To evaluate the classroom management practices in Turkey and abroad.
<b>Course Content</b>	Basic concepts related to classroom management, communication and interaction in classroom, definition of classroom management, properties of classroom management and its difference from classroom discipline, interior and exterior effects on classroom, models of classroom management, development of rules in classroom and application, organizing of classroom physically, management of undesirable behaviors in classroom, management of time in classroom, organization of classroom, to form the constructive classroom which is suitable for learning (examples and suggestions).
<b>Learning</b>	<ol style="list-style-type: none"> <li>1. New approaches in classroom management</li> </ol>

<b>Objectives</b>	<ol style="list-style-type: none"> <li>2. Basic concepts of classroom management</li> <li>3. The main dimensions of classroom management</li> <li>4. The qualifications of educational environment</li> <li>5. Teaching methods and techniques</li> <li>6. Planning and controlling teaching</li> <li>7. Time management</li> <li>8. Management of behaviour</li> <li>9. The basic concepts of personality</li> <li>10. Communication in general</li> <li>11. Communication to students</li> <li>12. Communication to parents</li> <li>13. Case studies on communication</li> <li>14. Motivation</li> <li>15. The main qualifications of being model teacher</li> <li>16. Leadership in classroom.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Aydın, A. (2005). Sınıf Yönetimi. Ankara: Eylül yayınevi</li> <li>2. Başar, H. (2005). Sınıf Yönetimi. Ankara: Anı yayıncılık</li> <li>3. Levin, J. and Nolan J.F. (2000). Principles of Classroom Management. Allyn and Bacon</li> </ol>

## FEN 451 Special Teaching Methods II

<b>Course Code</b>	FEN 451
<b>Course Title</b>	Special Teaching Methods II
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Fourth
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-2-0
<b>Duration</b>	1 Semester
<b>Semester</b>	7. Semester
<b>Examination</b>	Mid-term exam and end-of-term exam, written form.
<b>Assessment</b>	Mid-term exam-40%, end of term exam-60%
<b>Description</b>	The main aim of the course is to treat teaching techniques in learning-teaching processes.
<b>Course Content</b>	Teaching techniques in subject areas, Learning- teaching processes, application of general teaching techniques into subject area teaching, Critical review of the text books in relation with specific teaching techniques, Micro education applications, Evaluation of the teaching processes.
<b>Learning Objectives</b>	<p>By the end of this module students will be able to:</p> <ol style="list-style-type: none"> <li>1. Criticize the text books.</li> <li>2. Learn methods and techniques of teaching strategies and compare with each other.</li> <li>3. Apply teaching techniques into subject area.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Demirel, Ö. (2006)</b> Öğretme sanatı, Pegama Yayınları, Ankara.</li> <li>2. <b>Demirel, Ö. (1996)</b> Genel öğretim yöntemleri, Usem Yayınları, Ankara.</li> <li>3. <b>Küçükahmet, L. (2002)</b> Öğretimde planlama ve değerlendirme, Nobel Kitabevi, Ankara</li> <li>4. <b>Doğanay, A., Karip, E., (2006)</b> Öğretimde planlama ve değerlendirme, Pegama Yayınları, Ankara</li> <li>5. <b>Soylu, H., (2004)</b> Fen öğretiminde yeni yaklaşımlar, Nobel Yayınları, Ankara</li> </ol>

## FEN 453 School Experience

<b>Course Code</b>	FEN 453
<b>Course Title</b>	School Experience
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Fourth
<b>Prerequisites</b>	None
<b>Local Credits</b>	3
<b>ECTS Credits</b>	5
<b>Weekly (Lectures-Practice-Laboratory)</b>	1-4-0
<b>Duration</b>	1 semester
<b>Semester</b>	7. Semester
<b>Examination</b>	One mid-term exam, final exam
<b>Assessment</b>	Mid-term exam30%, final exam70%
<b>Description</b>	The main purpose of the course is to show the school, students and teacher vacation to teacher candidates with the help of a teacher and To know teacher characteristics and to know the basic skills related with teaching.
<b>Course Content</b>	Observation of one day of teacher and student in the school, to observe; how does the teacher organize the lecture, how does the teacher divide the lecture to stages, how does the teacher apply teaching methods and techniques, what types activity are used by teacher during the lecture, what does the teacher for the management of lecture and the control of classroom, how does the teacher finish the lecture, how does evaluate the study of students, to examine the organization of school, how does the director make duties, , and school-community relations, preparation of portfolio which shows school experience studies.
<b>Learning Objectives</b>	By the end of this module students will be able: <ol style="list-style-type: none"> <li>1. To prepare a semester plan.</li> <li>2. To know a day in school for a teacher</li> <li>3. To know a day in school for a student,</li> <li>4. To know teaching Methods</li> <li>5. To know the process of a courses</li> <li>6. To understand the course administration and control</li> <li>7. To learn asking the question tecnics</li> <li>8. To know school materials</li> <li>9. To know school principals and school rules</li> <li>10. To know school and society relations</li> <li>11. To use mikro- teaching technics</li> </ol>
<b>Read List</b>	1. The Book of School- Faculty Cooperation (1998) , YOK

## BIY 451 Special Topics In Biology

<b>Course Code</b>	BIY 451
<b>Course Title</b>	Special Topics In Biology
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Fourth
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice-</b>	2-0-0

<b>Laboratory)</b>	
<b>Duration</b>	1 semester
<b>Semester</b>	7. Semester
<b>Examination</b>	Mid-term exam, final exam,.
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	The main object of the course is to show the industrial and scientific application of biological
<b>Course Content</b>	Genetically modified organisms (GMO), Stem cell Technology, organ transports and importance of organ donation, Importance of biology in terms of community, science and technology. Developed processes of drugs and cosmetic products and effects in environment. Removal of toxic substance in environment using microorganisms. Prepared food, preparation processes and risks. Chemical matters (drugs, dyes, detergants) and biological effects. Organisms in near environments ( single cells, home mites, insects). Biological sensors. Genetic copying. Usage of nanotechnology in biology. Bioinformatic
<b>Learning Objectives</b>	At the end of the course, students will: 1. be able to know genetically modified organisms 2. be able to understand importance of organ donation 3. be able to understand removal of toxic substance in environment using microorganisms. 4. be able to learn chemical matters and biological effects. 5. be able to know usage of nanotechnology in biology 6. be able to learn biological sensors, genetic copying
<b>Read List</b>	1. Topal Ş., 2006. Biyogüvenlik ve Biyoteknoloji 2. Rifkin J. Biyoteknoloji Yüzyılı ,Genlerden Yararlanma ve Dünyayı Yeniden Kurma Evrim Yayınları 3. Öner M., 1988, İleri Endüstriyel Mikrobiyoloji Ders Notları 4. Gündüz T., 1994, Çevre Sorunları

## BİY 453 Evolution

<b>Ders Kodu</b>	BİY 453
<b>Ders Adı</b>	Evolution
<b>Öğretim Düzeyi</b>	Bachelor
<b>Sınıf</b>	Fourth
<b>Ön Şart</b>	Yok
<b>Yerel Kredisi</b>	2
<b>AKTS Kredisi</b>	5
<b>Haftalık Ders Saati (Teorik-Uygulama-Laboratuar)</b>	2-0-0
<b>Süre</b>	1 semester
<b>Dönem</b>	7. semester
<b>Sınav</b>	Mid-term exam and final exam
<b>Değerlendirme</b>	Mid-term exam 30% final exam 70%
<b>Dersin Temel Amacı</b>	Teaching students the development and diversity of life from its' first existence to recent times and the scientific evidencies concerning the process of evolution.
<b>İçerik</b>	1 General definition of evolution concept 2 Inorganic evolution 3 Evolution of cell 4 Evolution of sexuality 5 Evolution in lab. 6 Geological times 7 Homology and parental relationships 8 Natural selection as an important material of evolution 9 History of evolutionary thought 10 Evidences supporting evolution 11 Variation 12 Types of isolation 13 Genetic drift 14 Population genetics 15 Human evolution
<b>Dersin Öğrenciye Kazandırdığı Beceriler</b>	After completing the course students will have the basic knowledge listing below. 1 General definition of evolution concept

	2 Inorganic evolution 3 Evolution of cell 4 Evolution of sexuality 5 Evolution in lab. 6 Geological times 7 Homology and parental relationships 8 Natural selection as an important material of evolution 9 History of evolutionary thought 10 Evidences supporting evolution 11 Variation 12 Types of isolation 13 Genetic drift 14 Population genetics 15 Human evolution
<b>Kaynaklar</b>	<b>Kaynaklar:</b> 1. <i>Kalıtım ve Evrim</i> , Prof. Dr. Ali Demirsoy, Meteksan Yayınları 2. <i>Dünden Bugüne İnsan</i> , Prof Dr. Metin Özbek İmge Yayınları

## VIII.SEMESTRE

### Turkish Educational System and School Management

<b>Course Code</b>	EGB 360
<b>Course Title</b>	Turkish Educational System and School Management
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Fourth
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	2
<b>Weekly (Lectures-Practice-Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	8. Semester
<b>Examination</b>	Mid-term exam and final exam
<b>Assessment</b>	Mid-term exam-30%, end of term exam-70%
<b>Description</b>	
<b>Course Content</b>	The aims and basic principles of Turkish Education System, legal laws and arrangements related to education, structure of Turkish education system, Management theory and process, organization and management of school, works related to personnel, students, teaching and administration in school management, social attending to school
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. understand basic issues in educational systems in Turkey and around the world</li> <li>2. understand historical and legal foundations of Turkish educational system</li> <li>3. Understand the structure of Turkish educational system</li> <li>4. know subsystems of Turkish educational system</li> <li>5. Identify educational issues and provide alternative solutions to them</li> <li>6. provide and develop projects related to issues in education.</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. Adem, M. (2005). <i>Ulusal Eğitim Politikamız ve Finansmanı</i>. Ankara: Ankara Üniv.</li> <li>2. Başaran, İ. E. (2006). <i>Türkiye Eğitim Sistemi</i>. Ankara.</li> <li>3. Ergün, M. (1997). <i>Atatürk Devri Türk Eğitimi</i>. Ankara: Ocak Yayınları.</li> <li>4. MEB. (1998). <i>Cumhuriyet'in 75 Yılında Gelişme ve Hedefler</i>. Ankara: MEB.</li> </ol>

	5. Kaya, Y. K. (1984). <b>İnsan Yetiştirme Düzenimiz</b> . Ankara: Hacettepe Üniversitesi.
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## FİZ 452 Astronomy

<b>Course Code</b>	FİZ 452
<b>Course Title</b>	Astronomy
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	Fourth
<b>Prerequisites</b>	None
<b>Local Credits</b>	2
<b>ECTS Credits</b>	4
<b>Weekly (Lectures-Practice- Laboratory)</b>	2-0-0
<b>Duration</b>	1 semester
<b>Semester</b>	8. Semester
<b>Examination</b>	Mid-term exam and final exam
<b>Assessment</b>	Mid-term exam-40%, end of term exam-60%
<b>Description</b>	The main object of the course is to give fundamental concepts about astronomy.
<b>Course Content</b>	Kepler's Law and The structure of solar system: Planets and their properties, Satellites. General structure of universe: Galaxy, The formation of Stars, red giants, nötron stars, white dwarfs, black holes.
<b>Learning Objectives</b>	By the end of this module students will be able to: <ol style="list-style-type: none"> <li>1. Analyze and resolve natural phenomenon.</li> <li>2. Associate the gained knowledge, analyze and interpret data.</li> <li>3. Apply and link the gained knowledge of natural sciences to interdisciplinary fields.</li> <li>4. correlate and apply gained knowledge directly with technology and industry</li> </ol>
<b>Read List</b>	<ol style="list-style-type: none"> <li>1. <b>Arny, T. T. (1994)</b>. Introduction to Astronomy , Mosby-Year Book, Inc.</li> <li>2. <b>Karaali, S. (1985)</b>. General Astronomy, İstanbul University Pub., istanbul.</li> <li>3. Any equivalent book.</li> </ol>

## FEN 452 Practice Teaching In elementary Education

<b>Course Code</b>	FEN 452
<b>Course Title</b>	Practice Teaching In elementary Education
<b>Academic Cycle</b>	Bachelor
<b>Year of Study</b>	(4) Fourth
<b>Prerequisites</b>	None
<b>Local Credits</b>	5
<b>ECTS Credits</b>	12
<b>Weekly (Lectures-Practice- Laboratory)</b>	2-6-0
<b>Duration</b>	1 Semester

<b>Semester</b>	8. Semester
<b>Examination</b>	Mid-term exam, final exam
<b>Assessment</b>	Mid-term exam-30%, final exam-70%
<b>Description</b>	The main purpose of the course is to prepare teacher candidates to teaching with teaching practices and adequacy for teaching with a plan and to know rules and notes.
<b>Course Content</b>	seminar for teaching practice and teach a subject or subjects in a plan in classroom in a day or two half day in a week .
<b>Learning Objectives</b>	<p>By the end of the course students should be able to:</p> <ol style="list-style-type: none"> <li>1. Preparation of Semmester Plan</li> <li>2. To learn principals for educational setting preparation</li> <li>3. To prepare and apply the educational setting</li> <li>4. To know Preparation of course material</li> <li>5. To Prepare of course material and applicate of it.</li> <li>6. To prepare of evaluation materials</li> <li>7. To Prepare and applicate of evaluation materials.</li> <li>8. To learn the school administration principal practices.</li> </ol>
<b>Read List</b>	1. The Book of School- Faculty Cooperation (1998) , YOK