Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
MAT2123	**3**	**0**	**0**	**3**	**3**	**Z**	**TR**	**2/FALL**
Course Name (Turkish**)**	**Yüksek Matematik**							
Course Name (English**)**	**Higher Mathematics**							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	1. To learn the concept of differential equation and obtain its solutions. 2. To apply it to chemical and biochemical problems.
Course Outline	First order differential equations, solution methods, application to chemical problems.
Textbook/ Material / Resources	Diferensiyel Denklemler ve Uygulamaları (Prof. Dr. Mehmet AYDIN...) Barış yayınevi Diferensiyel Denklemler teorisi ve çözümlü örnekler (Prof. Dr. Rauf AMİROV...) Nobel yayınevi
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**
Ege University				Compulsory

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Prof. Dr. Erdal BAŞ	
Instructors who can teach the course (Title, Name and Surname)	*Signature*
Prof. Dr. Erdal BAŞ	

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)
theoretical

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)

Stakeholder Name	**Opinion** (Should be given as a summary, not exceeding two lines.)

Weekly Course Content Distribution

Week	Theory	Application / Laboratory
1	Introduction to differential equations: Concepts of order and degree in differential equations	
2	Solutions of differential equations, types of solutions, initial boundary-value problems	
3	First Order Differential Equations: Separable D.D.-Linear D.D.	
4	First Order Differential Equations: Exact D.D., Integrating Factor	
5	First Order Differential Equations: Bernoulli D.D. -Homogeneous D.D.	
6	Applications of first order differential equations: Chemical applications, observation problems	
7	Applications of first order differential equations: Biochemical applications	
8	Higher Order Linear Differential Equations (Homogeneous-Nonhomogeneous constant coefficient Lin. D.D.)	
9	Method of Undetermined Coefficients	
10	Method of Variation of Parameters	
11	Laplace Transform and its Properties	
12	Laplace Transform Method	
13	Solution of Initial Value Problems with the Laplace Transform Method	
14	Solutions of Linear Differential Equations in Terms of Power Series I	
15	Solutions of Linear Differential Equations in Terms of Power Series II	
16		

Assessment			
Evaluation Criteria	**Activity**	**Custom**	**Contribution to Success Grade (%)**
	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
		Sum:	100
Remarks			

Content Design and Subject Weight (%)		
	Mathematics and Basic Sciences	*100*
	Engineering Sciences	
	Social Sciences	
	Health Sciences	

	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	**Number**	**Duration (Hours)**	**Total workload (Hours)**
Fieldwork			
Midterm Exam Application	*1*	*3*	*3*
Self-Study (including pre-class and exam preparation)	*7*	*2*	*14*
Make-up Exam	*1*	*3*	*3*
Experiment and Observation			
Class Participation (Theory)	*14*	*3*	*42*
Homework			
Final Exam Practice	*1*	*3*	*3*
Laboratory			
Article Review			
Writing an Article			
Reading			
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument	*7*	*1*	*7*
Application/Practice			
Other			
TOTAL WORKLOAD:			**72**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**3**

	Program Outcomes (PO) / **Learning Outcomes (LO)** *(Course Outcomes)*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1	Understands the concept of differential equations and their properties	**5**	**3**	**4**	**1**	**2**	**3**	**4**	**3**	**4**	**2**	**2**
2	Learns the solution methods of first order differential equations	**3**	**2**	**2**	**3**	**4**	**3**	**3**	**4**	**3**	**3**	**1**
3	Solves different types of differential equations and obtains analytical solutions.	**4**	**4**	**3**	**4**	**3**	**2**	**3**	**3**	**3**	**4**	**1**
4	Applies differential equations to chemical problems and analyzes the results.	**4**	**2**	**3**	**3**	**4**	**4**	**1**	**5**	**2**	**2**	**1**
	Learns the Laplace transform and applies it to initial value problems.	**4**	**3**	**5**	**2**	**1**	**2**	**3**	**3**	**5**	**3**	**1**

Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
CHEM2127	**4**	**0**	**0**	**4**	**4**	**Z**	**TR**	**2/FALL**
Course Name (Turkish**)**	**Anorganik Kimya I**							
Course Name (English**)**	**Inorganic Chemistry I**							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	Learning the concepts of inorganic chemistry
Course Outline	The electron structure of the atom, Light and matter, Spectrum of the hydrogen atom, Bohr atom model, Quantum model of the atom, Hydrogen and hydrogen-like atoms, Multi-electron atoms, Effective nuclear charge, Periodic properties of elements, Periodic table and radius of atoms, ionization energy, electron affinity, electronegativity, Molecular structure: Lewis dot structure and resonance, VSEPR theory, Bond energy, Valence bond theory, Solids, crystalline solids, ionic radii, lattice energy, semiconductivity and superconductivity.
Textbook/ Material / Resources	Inorganik Kimya, Garly L.Miessler, Donald A.Tarr, Çevirmen : Çeviri Editörleri : Nurcan Karacan,Perihan Gürkan, Palme Yayınları, 2009, Ankara Anorganik Kimya Namık. K. Tunalı, Saim Özkar, Gazi Kitap Evi, 6. Baskı, 2007 Ankara
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**
Ege University	Chemistry	Inorganic Chemistry	**3-1-2-0-7**	Compulsory
Yıldız Technical University	Chemistry	Inorganic Chemistry	**3-2-4-0-5**	Compulsory
Eskişehir Osmangazi University	Chemistry	Inorganic Chemistry	**3-0-3-0-5**	Compulsory

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Prof. Dr. Sinan SAYDAM	
Instructors who can teach the course (Title, Name and Surname)	*Signature*
Prof. Dr. Memet Şekerci, Prof. Dr. Ayşegül YAZICI, Doç. Dr. Kenan KORAN	

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)	
Stakeholder Name	**Opinion** (Should be given as a summary, not exceeding two lines.)

Weekly Course Content Distribution		
Week	**Theory**	**Application/ Laboratory**
1	Introduction to inorganic chemistry, historical development, difference from organic chemistry	
2	Atomic models, Bohr atomic model	
3	Quantum atomic model,	
4	Single electron, multi-electron atomic models,	
5	Hund and Stater Rules	
6	Periodic properties of elements, Size of the atom, Ionization energy, Electron affinity, Electronegativity	
7	Mid-term exam	
8	Chemical bonds	
9	Lewis bond theory, Resonance	
10	VSPER theory and molecular geometry	
11	Valence bond theory	
12	Bond length, bond energy, intermolecular interactions	
13	Solids, crystalline solids	
14	Ionic radius and crystal structures, lattice energy, semiconductivity and superconductivity	
15	Final exam	
16		

Assessment			
Evaluation Criteria	**Activity**	**Custom**	**Contribution to Success Grade (%)**
	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	100
	Engineering Sciences	30
	Social Sciences	
	Health Sciences	30
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	**Number**	**Duration (Hours)**	**Total workload (Hours)**
Fieldwork			
Midterm Exam Application	*1*	*3*	*3*
Self-Study (including pre-class and exam preparation)	*2*	*10*	*20*
Make-up Exam	*1*	*3*	*3*
Experiment and Observation			
Class Participation (Theory)	*14*	*4*	*56*
Homework			
Final Exam Practice	*1*	*3*	*3*
Laboratory			
Article Review			
Writing an Article			
Reading			
Case Study			
Performance			
Problem Solution	*14*	*1*	*14*
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument	*7*	*1*	*7*
Application/Practice			
Other			
TOTAL WORKLOAD:			**106**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**4**

	Learning Outcomes (LO) *(Course Outcomes)*	**Program Outcomes (PO)** *1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1	Knows the principles and approaches of inorganic chemistry.	**5**	**4**	**4**	**3**	**2**	**1**	**2**	**2**	**3**	**5**	**1**
2	Students know the basic approaches and concepts of inorganic chemistry.	**5**	**5**	**4**	**3**	**3**	**3**	**4**	**4**	**2**	**2**	**1**
3	Students will have knowledge that forms the basis of the courses, such as atomic structure,	**5**	**3**	**2**	**5**	**4**	**2**	**2**	**3**	**4**	**4**	**1**

	chemical bonds, and molecular structures.											
4	Students know how to analyze basic problems in inorganic chemistry and apply mathematical methods and principles of inorganic chemistry.	**3**	**3**	**2**	**4**	**4**	**4**	**1**	**5**	**3**	**3**	**1**
5	Students will learn about inorganic chemistry and other chemistry fields and their applications in daily life.	**5**	**4**	**4**	**4**	**3**	**3**	**2**	**4**	**4**	**4**	**5**

Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
CHEM2131	**4**	**0**	**0**	**4**	**4**	**Z**	**TR**	**2/FALL**
Course Name (Turkish**)**	**Organik Kimya-1**							
Course Name (English**)**	**Organic Chemistry-1**							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	To introduce basic concepts such as writing the open structures of organic compounds, naming organic compounds, physical and chemical properties of organic molecules, stereochemistry. To provide information on the preparation and reactions of alkanes, cycloalkanes, alkyl halides and alkenes and alkynes. To teach the basic concepts and principles of Organic Chemistry.
Course Outline	Introduction to Organic Chemistry and Chemical Bonding, Basic Concepts in Organic Chemistry, Functional Groups and Intermolecular Forces, Alkanes, Cycloalkanes and Conformational Analysis, Introduction to Stereochemistry, Alkyl Halides and Nucleophilic Substitution, Elimination Reactions, Radical Reactions, Alkenes and Alkynes, Alcohols and Ethers
Textbook/ Material / Resources	1. Organik Kimya, (7. baskı) Graham Solomons, Craig Fryhle, Çeviri Editörü: Güral Okay Yılmaz Yıldırır, Literatür Yayıncılık, İstanbul. 2. Organik Kimya, Çeviri Editörü: Tahsin Uyar (Harold Hart, Leslie E. Craine, David J. Hart, Christopher M. Hadad), 12. Baskı, Palme Yayınevi. 3. Organic Chemistry, Jonathan Clayden, Nick Greeves, Stuart Warren, Peter Wothers, Oxford Chemistry Primer, 2001.
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**
Istanbul University	Chemistry	Organic Chemistry-1	**3-0-4-5**	Compulsory
Inonu University	Chemistry	Organic Chemistry-1	**4-0-4-4**	Compulsory
Ankara University	Chemistry	Organic Chemistry-1	**4-0-4-5**	Compulsory

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Prof. Dr. Süleyman Servi	
Instructors who can teach the course (Title, Name and Surname)	*Signature*
Prof. Dr. Süleyman Servi	

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

1. To provide the ability to scientifically predict and interpret the reactivities and chemical properties of organic molecules,
2. Explain the reactions of organic compounds according to the basic functional groups they contain.
3. To learn the relationship between the structural information of organic molecules and the properties of molecules such as carbohydrates, amino acids, proteins and nucleic acids
4. Explain the relationship between the sciences of Organic Chemistry, Biology, Physics, Medicine and Pharmacology.

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

Theoretically, it will be explained verbally and in writing with computer support.

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)	
Stakeholder Name	**Opinion** (Should be given as a summary, not exceeding two lines.)

Weekly Course Content Distribution

Week	Theory	Application / Laboratory
1	Covalent Bonding in Organic Molecules, Valence Bond Theory, Molecular Orbital Theory, Electronegativity, Inductive and Mesomeric Effects, Hybridization of Carbon, Bond Lengths and Bond Energies, Reactive Carbon Intermediates	
2	Functional Groups, Intermolecular Forces, Organic Acids and Bases	
3	Nomenclature of Organic Molecules, Straight Chain Alkanes, Cycloalkanes and Conformational Analysis, Alkenes and Alkynes, Amines, Alcohols, Ketones, Aldehydes, Carboxylic Acids	
4	General Information on Some Organic Reactions and Mechanisms, Electrophiles (E) and Nucleophiles (Nü), Nucleophilic Substitution and Elimination Reactions, Nucleophilic Addition Reactions, Electrophilic Addition Reactions, Radical Reactions	
5	Stereochemistry, Enantiomers, Biological Importance of Chirality, Nomenclature of Enantiomers, Properties of Enantiomers, Optical Activity, Splitting of Enantiomers, Fischer Projection Formulas, Stereoisomers in Cyclic Compounds	
6	Aliphatic Hydrocarbons and General Properties, Preparation Methods of Alkanes, Reactions of Alkanes	
7	General Properties of Alkyl Halides, Preparation Methods of Alkyl Halides	
8	Reactions of Alkyl Halides, Thermodynamic and Kinetic Investigation of Reaction Mechanisms	
9	General Properties of Alkenes, Methods of Preparation of Alkenes	
10	Reactions of Alkenes, Thermodynamic and Kinetic Investigation of Reaction Mechanisms	
11	General Properties of Alkynes, Methods of Preparation of Alkynes, Reactions of Alkynes	
12	Make-up Exam	
13	General Properties of Alcohols and Ethers, Methods of Preparation of Alcohols and Ethers,	
14	Reactions of Alcohols and Ethers, General Properties of Ethers, Methods of Preparation of Ethers, Reactions of Ethers	
15	FINAL	

Assessment

	Activity	Custom	Contribution to Success Grade (%)
Evaluation Criteria	Midterm Exams	1	40
	Quizzes		

	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	100
	Engineering Sciences	30
	Social Sciences	
	Health Sciences	30
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	**Number**	**Duration (Hours)**	**Total workload (Hours)**
Fieldwork			
Midterm Exam Application	1	3	3
Self-Study (including pre-class and exam preparation)	1	10	10
Make-up Exam	1	3	3
Experiment and Observation			
Class Participation (Theory)	14	4	56
Homework			
Final Exam Practice	1	3	3
Laboratory			
Article Review			
Writing an Article			
Reading	10	2	10
Case Study			
Performance			
Problem Solution	10	2	20
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument	6	1	6
Application/Practice			
Other			
TOTAL WORKLOAD:			**110**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**4**

Program Outcomes (PO)	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*

	Learning Outcomes (LO) *(Course Outcomes)*											
1	To provide the ability to scientifically predict and interpret the reactivities and chemical properties of organic molecules,	**5**	**5**	**3**	**2**	**3**	**2**	**3**	**4**	**4**	**3**	**3**
2	Explain the reactions of organic compounds according to the basic functional groups they contain.,	**5**	**3**	**4**	**4**	**4**	**3**	**2**	**3**	**4**	**2**	**4**
3	Learn the relationship between the structural information of organic molecules and the properties of molecules such as carbohydrates, amino acids, proteins and nucleic acids,	**4**	**4**	**3**	**2**	**4**	**2**	**2**	**3**	**4**	**3**	**4**
4	To provide the ability to establish the relationship between Organic Chemistry as a science and the scientific fields of Biology, Physics, Medicine and Pharmacology.	**5**	**4**	**4**	**5**	**4**	**3**	**3**	**3**	**4**	**3**	**4**

Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
CHEM2125	**2**	**0**	**0**	**2**	**3**	**Z**	**TR**	**2/FALL**
Course Name (Turkish**)**	**Kimyacılar İçin Bilgisayar Uygulamaları**							
Course Name (English**)**	**Computer Applications For Chemists**							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	To teach students how to solve chemical data with relevant programs in a computer environment, how to use chemical programs, how to draw graphics with computer programs, and how to make theoretical calculations and analyzes of chemical structures.
Course Outline	Use of general computer programs in chemical calculations (Word, Excel, Power Point), writing experimental formulas, figures, calculations with computer programs (tables, graphs, equations and writing chemical formulas and drawing open formulas), use of statistics programs.
Textbook/ Material / Resources	Gisbert Schneider, Karl-Heinz Baringhaus ‘’Molecular Design Concepts and Applications”, Wiley, 2008. ChemDraw 21 paket programı, Perkin-Elmer, 2021. SPSS Paket Programı, Microsoft Office (Word, Excel, Power point) UV, FT-IR, NMR Paket Programları
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**
Pamukkale University	Chemistry	Computer Applications For Chemists	**2-0-0-2-3.5**	Elective
Selcuk University	Chemistry	Computer Applications For Chemists	**2-1-0-2-2**	Compulsory

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Doç. Dr. Kenan KORAN	
Instructors who can teach the course (Title, Name and Surname)	*Signature*
Prof. Dr. Sinan SAYDAM, Prof. Dr. Mehmet ŞEKERCİ, Prof. Dr. Ayşegül YAZICI, Doç. Dr. Kenan KORAN	

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Students can easily make forward-looking plans and produce reliable results as a result of learning the basic achievements such as drawing, analysis, interpretation and calculation that need to be done with computers in chemistry during their post-graduate work life or academic education.

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

The course will be continued theoretically in a classroom environment with relevant visual and presentation explanations.

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)

Stakeholder Name	**Opinion** (Should be given as a summary, not exceeding two lines.)

Weekly Course Content Distribution		
Week	**Theory**	**Application/ Laboratory**
1	Use of Computer and Office Programs in Chemistry Applications, Word	
2	Use of Office Programs in Chemistry Applications, Excel	
3	Use of Office Programs in Chemistry Applications, Excel, Power point	
4	Statistical Analysis	
5	Statistical Analysis	
6	Training of Chemistry Drawing Programs (Chemdraw, Chemsketch)	
7	Drawing of chemical formulas and source scanning programs (Scifinder, Reaxys)	
8	Introduction and Training of Chemistry Theoretical Programs (Molecular Docking and Gaussian)	
9	Midterm Exam	
10	Introduction and Training of Chemistry Theoretical Programs (Molecular Docking and Gaussian)	
11	Training of Programs Used in Molecular Spectroscopy (UV-vis), FT-IR, NMR	
12	Training of Programs Used in Molecular Spectroscopy, FT-IR	
13	Training of Programs Used in Molecular Spectroscopy, NMR	
14	Training of Programs Used in Thermal Analysis Methods	
15	Final	
16		

Assessment			
	Activity	**Custom**	**Contribution to Success Grade (%)**
Evaluation Criteria	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	100
	Engineering Sciences	
	Social Sciences	
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	

	Design Information	

Workload (ECTS) Calculation			
Events	**Number**	**Duration (Hours)**	**Total workload (Hours)**
Fieldwork			
Midterm Exam Application	*1*	*2*	*2*
Self-Study (including pre-class and exam preparation)	*14*	*2*	*28*
Make-up Exam	*1*	*2*	*2*
Experiment and Observation			
Class Participation (Theory)	*14*	*2*	*28*
Homework			
Final Exam Practice	*1*	*2*	*2*
Laboratory			
Article Review			
Writing an Article			
Reading			
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument	*14*	*1*	*14*
Application/Practice	*3*	*1*	*3*
Other			
TOTAL WORKLOAD:			**79**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**3**

	Learning Outcomes (LO) *(Course Outcomes)*	**Program Outcomes (PO)** *1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1	Knows computer office applications and their use in chemistry.	**2**	**3**	**3**	**1**	**5**	**1**	**1**	**4**	**4**	**3**	**1**
2	Knows how to do statistical analysis.	**2**	**3**	**3**	**1**	**5**	**1**	**1**	**4**	**4**	**3**	**1**
3	Knows chemistry drawing programs.	**2**	**3**	**3**	**1**	**5**	**1**	**1**	**4**	**4**	**3**	**1**
4	Knows the use of computational chemistry programs.	**2**	**3**	**3**	**1**	**5**	**1**	**1**	**4**	**4**	**3**	**1**
5	Knows the programs used in the analysis of data in chemical spectroscopic and thermal methods.	**2**	**3**	**3**	**1**	**5**	**1**	**1**	**4**	**4**	**3**	**1**

Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
CHEM2121	**4**	**0**	**0**	**4**	**5**	**Z**	**TR**	**2/FALL**
Course Name (Turkish**)**	**Analitik Kimya I**							
Course Name (English**)**	**Analytical Chemistry I**							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	The general steps of chemical analysis, chemical principles, calculation of errors in quantitative analysis and statistical evaluation of analytical data, which are important in analytical chemistry, and providing the necessary theoretical information for the use of analytical chemistry in quantitative and qualitative analysis methods. Using this information and statistical methods, teaching the necessary laboratory skills to evaluate experimental data and obtain quality data.
Course Outline	Analytical Chemistry and its relationship with other branches of science, Calculations in Analytical Chemistry, Solutions, Errors in Chemical Analysis, Statistical Data Processing and Evaluation, Preparation of Samples, Sampling, Standardization and Calibration, Aqueous Solutions Chemistry and Chemical Balance, Effect of Electrolytes on Chemical Balance, Solution of Balance Problems in Complex Systems, Gravimetric Analysis Methods
Textbook/ Material / Resources	Analitik Kimya - Temel İlkeler, 8.Baskı; D. A. Skoog, D. M. West, F.J. Holler, S.R. Crouch. Thomson Pub.. US. (2004); Çeviri Editörleri: E.Kılıç ve H. Yılmaz- Bilim Yayıncılık- Ankara
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**
Gazi University	Chemistry	Analytical Chemistry I	**4-0-0-4- 6**	Compulsory
Yıldız Technical University	Chemistry	Analytical Chemistry I	**4-0-0-4- 4**	Compulsory
Namık Kemal University	Chemistry	Analytical Chemistry I	**4-0-0-4- 4**	Compulsory

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Prof. Dr. Habibe Özmen	
Instructors who can teach the course (Title, Name and Surname)	*Signature*
Prof. Dr. Ali Ölçücü, Prof. Dr. Mehmet Yaman	

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)

Stakeholder Name	Opinion (Should be given as a summary, not exceeding two lines.)

Weekly Course Content Distribution		
Week	**Theory**	**Application/ Laboratory**
1	Definitions and Chemical Calculations in Analytical Chemistry	
2	Errors in Chemical Analysis	
3	Random Errors in Chemical Analysis	
4	Processing and Evaluation of Statistical Data	
5	Processing and Evaluation of Statistical Data	
6	Preparation of Samples for Analysis, Standardization and Calibration	
7	Aqueous Solutions and Chemical Equilibrium	
8	Aqueous Solutions and Chemical Equilibrium	
9	Midterm Exam / Sample Solutions or Topic Review	
10	Effect of Electrolytes on Chemical Equilibrium and Solubility Product	
11	Systematic Investigation of Activity and Equilibrium	
12	Solution of Equilibrium Problems in Complex Systems	
13	Solution of Equilibrium Problems in Complex Systems	
14	Introduction to Gravimetric Analysis Methods	
15	Final	

Assessment			
Evaluation Criteria	**Activity**	**Custom**	**Contribution to Success Grade (%)**
	Midterm Exams	1	40
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	60
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	100
	Engineering Sciences	
	Social Sciences	
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation

Events	Number	Duration (Hours)	Total workload (Hours)
Fieldwork			
Midterm Exam Application	*1*	*2*	*2*
Self-Study (including pre-class and exam preparation)	*10*	*4*	*40*
Make-up Exam	*1*	*2*	*2*
Experiment and Observation			
Class Participation (Theory)	*14*	*4*	*56*
Homework			
Final Exam Practice	*1*	*2*	*2*
Laboratory			
Article Review			
Writing an Article			
Reading	*10*	*1*	*10*
Case Study			
Performance			
Problem Solution	*14*	*1*	*14*
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument	*7*	*1*	*7*
Application/Practice			
Other			
TOTAL WORKLOAD:			**133**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**5**

	Program Outcomes (PO) / **Learning Outcomes (LO)** *(Course Outcomes)*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1	Learn chemical calculations, solution preparation, sampling, laboratory sample preparation, standardization and calibration processes.	**5**	**5**	**5**	**3**	**2**	**4**	**2**	**1**	**2**	**1**	**1** **1**
2	It statistically evaluates and reports the errors that occur as a result of the analysis and the analytical data obtained.	**5**	**5**	**5**	**3**	**3**	**4**	**3**	**1**	**3**	**1**	**1**
3	Learn the chemical balances that occur in the aqueous environment and the effect of electrolytes on the balance.	**5**	**5**	**5**	**3**	**2**	**2**	**3**	**1**	**2**	**1**	**1**
4	Learn how to solve multiple equilibrium problems that occur in complex systems.	**5**	**5**	**5**	**3**	**2**	**2**	**2**	**1**	**1**	**1**	**1**
5	In gravimetric analysis, one of the quantitative analysis methods, the relative amounts of analytes in the sample are determined.	**5**	**5**	**5**	**3**	**2**	**3**	**3**	**1**	**2**	**1**	**1**

Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
YDİ207	**2**	**0**	**0**	**2**	**2**	**Z**	**TR**	**2/FALL**
Course Name (Turkish**)**	Yabancı Dil I							
Course Name (English**)**	**Foreign Language I**							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	This course aims to help students; Have basic grammar, Understand what they listen to, Be able to speak to each other, Understand what they read, Be able to express themselves in writing at B1 level in English for undergraduate level.
Course Outline	Expressing our plans and strong predictions for the future using the form 'be going to', using adjectives derived from verbs; expressing the recent past with the present perfect tense, using the structures 'just/yet/already/ever/never/for/since' in a sentence; expressing sufficiency or excess using the structures 'enough and too'; expressing short and long actions in the past with the conjunctions 'when, while'; expressing our instant decisions and predictions for the future with 'will', using degrees of certainty in a sentence.
Textbook/ Material / Resources	Full Steam Ahead, 8th ed., Gündüz Eğitim ve Yayıncılık, Ankara. Türkçe-İngilizce Sözlük
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Distance Education Coordinator	
Instructors who can teach the course (Title, Name and Surname)	*Signature*

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)

Stakeholder Name	**Opinion** (Should be given as a summary, not exceeding two lines.)

Weekly Course Content Distribution		
Week	**Theory**	**Application / Laboratory**
1	What are you going to do in the afternoon? a. future plans and arrangements, and strong predictions	
2	What are you going to do in the afternoon? a. be going to with positive, negative and interrogative forms b. adjectives derived from verbs. Vocabulary teaching	
3	I've already done it! a. the past participle forms of the irregular verbs b. present perfect tense with has/ have verb3	
4	I've already done it! a. recent actions with yet, just, already b. past experiences: have you ever…? before, never, once… Voc. teaching	
5	I've known her since… a. actions that started in the past and continuing in the present b. how long…? for, since. …enough, too…	
6	General Revision and voc. teaching	
7	The dog was barking! a. actions interrupted at specific times in the past: time expressions b. actions interrupted by shorter actions in the past:… when…	
8	What are you going to do in the afternoon? a. future plans and arrangements, and strong predictions	
9	**Midterm Exam**	
10	The dog was barking! a. parallel actions happening in the past:…while… b. reflexive pronouns	
11	What will the teacher ask? a. immediate decisions and future predictions	
12	What will the teacher ask? a. degrees of certainty (will/ will not/ will probably/ will probably not/ may/ might/ could/ may not/ might not) vocabulary teaching. Near Future Tense(to be going to)	
13	What will the teacher ask? a. the use of will and be going to	
14	The dog was barking! a. parallel actions happening in the past:…while… b. reflexive pronouns	
15	**Final**	
16		

Assessment			
Evaluation Criteria	**Activity**	**Custom**	**Contribution to Success Grade (%)**
	Midterm Exams	1	20
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	80
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	
	Engineering Sciences	
	Social Sciences	*100*
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	**Number**	**Duration (Hours)**	**Total workload (Hours)**
Fieldwork			
Midterm Exam Application			
Self-Study (including pre-class and exam preparation)			
Make-up Exam			
Experiment and Observation			
Class Participation (Theory)			
Homework			
Final Exam Practice			
Laboratory			
Article Review			
Writing an Article			
Reading			
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument			
Application/Practice			
Other			
TOTAL WORKLOAD:			
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**2**

	Learning Outcomes (LO) *(Course Outcomes)*	**Program Outcomes (PO)** *1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1	Have sufficient foreign language knowledge in the field	**5**	**5**	**5**	**3**	**2**	**5**	**3**	**5**	**4**	**5**	**1**
2	Can comprehend long messages	**5**	**5**	**5**	**2**	**2**	**2**	**4**	**2**	**2**	**2**	**1**
3	Can comprehend long, daily texts	**5**	**4**	**5**	**1**	**1**	**1**	**2**	**1**	**5**	**2**	**1**
4	Can write long, advanced notes and messages	**5**	**5**	**4**	**5**	**3**	**4**	**5**	**5**	**3**	**4**	**1**

Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
AİT209	**2**	**0**	**0**	**2**	**2**	**Z**	**TR**	**2/FALL**
Course Name (Turkish**)**	Atatürk İlke ve İnkılapları Tarihi I							
Course Name (English**)**								

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	To ensure that students gain historical and civic awareness and are equipped with general cultural knowledge.
Course Outline	The collapse of the Ottoman Empire, the War of Independence and the establishment of the Republic
Textbook/ Material / Resources	Yükseköğretim Kurulu Yayınları, Atatürk İlkeleri ve İnkılâp Tarihi I/1 Nutuk, Söylev ve Demeçler, E. Semih Yalçın, Atatürk'ün Milli Dış Siyaseti, Mehmet Gönlübol ve Diğerleri, Olaylarla Türk Dış Politikası, Fahir Armaoğlu, 20. Yüzyıl Siyasi Tarihi
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Uzaktan Eğitim Koordinatörü	
Instructors who can teach the course (Title, Name and Surname)	*Signature*

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

External Stakeholder Opinions About the Course (It is expected that the opinions to be obtained from the business world that will employ your graduates or from real or legal persons outside the University who have expertise on the subject of the course will be specified. Proof documents must be attached to this form.)

Stakeholder Name	**Opinion** (Should be given as a summary, not exceeding two lines.)

Weekly Course Content Distribution		
Week	**Theory**	**Application/Laboratory**
1	Introduction; concepts and terms	
2	Reasons for the collapse of the Ottoman state	
3	Efforts to save and modernize the Ottoman state (reforms)	
4	Constitutional movements and last period intellectual movements	
5	The collapse of the Ottoman state	
6	The Union and Progress administration and the First World War	
7	The signing and provisions of the Armistice of Mudros	
8	Reactions against the armistice, beneficial and harmful societies	
9	MIDTERM EXAM	
10	Mustafa Kemal Pasha's arrival in Samsun and developments	
11	Kuvay-ı Milliye and Misak-ı Milli	
12	The opening of the Turkish Grand National Assembly and its taking over the administration in Anatolia	
13	National fronts and political developments, Sakarya-Great Tarruz wars, Mudanya Armistice and Lausanne Treaty	
14	SUMP EXAM	
15	GENERAL EXAM	
16		

Assessment			
Evaluation Criteria	**Activity**	**Custom**	**Contribution to Success Grade (%)**
	Midterm Exams	1	20
	Quizzes		
	Assignments		
	Projects		
	Term Paper		
	Laboratory		
	Other		
	Final Exam	1	80
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	
	Engineering Sciences	
	Social Sciences	100
	Health Sciences	

	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	**Number**	**Duration (Hours)**	**Total workload (Hours)**
Fieldwork			
Midterm Exam Application			
Self-Study (including pre-class and exam preparation)			
Make-up Exam			
Experiment and Observation			
Class Participation (Theory)			
Homework			
Final Exam Practice			
Laboratory			
Article Review			
Writing an Article			
Reading			
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz			
Report Preparation			
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument			
Application/Practice			
Other			
TOTAL WORKLOAD:			
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**2**

	Learning Outcomes (LO) *(Course Outcomes)*	**Program Outcomes (PO)** *1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1	Learn about the transition from the Ottoman Empire to the Republic of Türkiye and the recognition of the foundations of the republic.	**5**	**5**	**5**	**3**	**2**	**5**	**3**	**5**	**4**	**5**	**1**
2												
3												
4												
5												

Course Information								
Course Code	**T**	**P**	**L**	**C**	**ECTS**	**Type** C/E	**Language** TR/ENG etc.	**Year/Semester**
CHEM 2123	**0**	**0**	**4**	**2**	**4**	**Z**	**TR**	**2/FALL**
Course Name (Turkish**)**	**Analitik Kimya Laboratuvarı I**							
Course Name (English**)**	**Analytical Chemistry Laboratory I**							

Unit/Program	Chemistry Department/Undergraduate Program
Course Prerequisite	No
Course Objectives	Analytical Chemistry Laboratory 1 course aims to put into practice the theoretical knowledge acquired in Analytical Chemistry courses by using basic laboratory procedures such as dissolving, precipitation, filtration and separation in order to determine which components a sample consists of using qualitative analysis methods.
Course Outline	Gaining the ability to group anions and cations, systematically separate anions and cations in mixtures and determine these anions and cations qualitatively, dissolve real samples and perform anion-cation analysis in these samples.
Textbook/ Material / Resources	Yarı Mikro Kalitatif Analiz Laboratuvar Kitabı, Turgut Gündüz, Gazi Kitapevi, 11. baskı, 2013Analitik Kimya Laboratuvarı Kitabı, Editör A. Atılır Özcan, AÖF Yayınları, 2009
Internship Status	No

Course Precedents

University Name	**Program Name**	**Course Name**	**T-P-L-C; ECTS**	**Type**
Gazi University	Chemistry	Analytical Chemistry Laboratory I	**0-0-6-2- 4**	Compulsory
Yıldız Technical University	Chemistry	Analytical Chemistry Laboratory I	**0-0-6-3- 5**	Compulsory
Hacettepe University	Chemistry	Analytical Chemistry Laboratory I	**0-0-6-2- 4**	Compulsory

The instructor who proposed the course (Title, Name and Surname)	*Signature*
Prof. Dr. Habibe Özmen	
Instructors who can teach the course (Title, Name and Surname)	*Signature*
Prof. Dr. Ali Ölçücü, Prof. Dr. Mehmet Yaman	

Academic justification for the opening of the course? (The effect of course outcomes on program outcomes, etc.)

Brief explanation of the course (theoretical lecture, applications, laboratory, studio, off-campus activity, using software, etc.)

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Stakeholder Name	**Opinion** (Should be given as a summary, not exceeding two lines.)

Weekly Course Content Distribution

Week	Theory	Application/Laboratory
1	General information about the laboratory	
2		Analysis of Group 1 Cations
3		Analysis of Group 2 Cations
4		Analysis of Group 2 Cations
5		Analysis of Group 3 Cations
6		Analysis of Group 4-5 Cations
7		Analysis of 1-5 cations
8		Analysis of 1-5 cations
9		Analysis of Group 1-2 Anions
10		Analysis of Group 3-4-5 Anions
11		Analysis of Group 1-5 Anions
12		Solubilization of real samples
13		Analysis of cations and anions in real samples
14		Compensation experiments
15		Compensation experiments
16		

Assessment			
Evaluation Criteria	**Activity**	**Custom**	**Contribution to Success Grade (%)**
	Midterm Exams		
	Quizzes	7	20
	Assignments		
	Projects		
	Term Paper		
	Laboratory	9	20
	Other		
	Final Exam	1	60
		Sum:	100
Remarks			

Content Design and Subject Weight (%)	Mathematics and Basic Sciences	100
	Engineering Sciences	
	Social Sciences	
	Health Sciences	
	Educational Sciences	
	Culture and Art Sciences	
	Design Information	

Workload (ECTS) Calculation			
Events	**Number**	**Duration (Hours)**	**Total workload (Hours)**

Fieldwork			
Midterm Exam Application			
Self-Study (including pre-class and exam preparation)	*10*	*2*	*10*
Make-up Exam	*1*	*2*	*2*
Experiment and Observation			
Class Participation (Theory)			
Homework			
Final Exam Practice	*1*	*2*	*2*
Laboratory	*14*	*4*	*56*
Article Review			
Writing an Article			
Reading	*10*	*1*	*10*
Case Study			
Performance			
Problem Solution			
Project Preparation			
Project Submission			
Quiz	*7*	*1*	*7*
Report Preparation	*9*	*2*	*18*
Submitting Reports			
Role/Drama Work			
Seminar			
Oral Exam			
Team/Group Work			
Argument			
Application/Practice			
Other			
TOTAL WORKLOAD:			**105**
ECTS CREDİTS OF THE COURSE: *(The number obtained as a result of Total Workload/25 is calculated by rounding to the whole number.)*			**4**

	Learning Outcomes (LO) *(Course Outcomes)*	**Program Outcomes (PO)** *1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1	Identifies the groups and specific reagents of I-V group cations.	**5**	**5**	**5**	**2**	**1**	**2**	**3**	**1**	**2**	**1**	**1** **1**
2	Identifies the groups and specific reagents of I-V group anions.	**5**	**5**	**5**	**2**	**1**	**2**	**3**	**1**	**2**	**1**	**1**
3	Determines the anions and cations in unknown aqueous samples.	**5**	**5**	**5**	**2**	**1**	**2**	**3**	**1**	**2**	**1**	**1**
4	Solubilizes solid samples and performs I-V anion-cation analysis.	**5**	**5**	**5**	**2**	**1**	**2**	**3**	**1**	**3**	**1**	**1**
5	Distinguishes the properties of solutions such as color, acid-base, odor.	**5**	**5**	**5**	**2**	**1**	**2**	**3**	**1**	**2**	**1**	**1**