

COURSE LIST Faculty of Arts & Sciences Department of Chemistry

Please note that Erasmus students are allowed to take courses from lists of all faculties/schools according to their needs or interests.

Courses offered in Turkish are listed at the website of the faculty <http://fef.comu.edu.tr/> or you can contact Departmental Coordinator to get the necessary information

Courses offered in English

Course Title	Code	ECTS Credit	COMU Credit	Lecturer
General Chemistry I	ULP-02-161	6	4	Prof. Dr. Eyüp ÖZDEMİR
General Chemistry II	ULP-02-162	6	4	Prof. Dr. Eyüp ÖZDEMİR
Inorganic Chemistry I	ULP-02-163	6	4	Prof. Dr. Yakup BARAN Assoc.Prof.Dr. OsmanDAYAN Assist.Prof.Dr.MustafaYILDIZ Assist.Prof.Dr. Ömer Faruk ÖZTÜRK
Inorganic Chemistry II	ULP-02-164	6	4	Prof. Dr. Yakup BARAN Assoc.Prof.Dr. OsmanDAYAN Assist.Prof.Dr.MustafaYILDIZ Assist.Prof.Dr. Ömer Faruk ÖZTÜRK
Analytical Chemistry I	ULP-02-165	6	4	Asoc. Prof. Dr. Yusuf DİLGİN
Analytical Chemistry II	ULP-02-166	6	4	Asoc. Prof. Dr. Yusuf DİLGİN
Physical Chemistry-I	ULP-02-167	6	4	Prof. Dr. Eyüp ÖZDEMİR Prof. Dr. İsmet KAYA Doç. Dr. Nurettin ŞAHİNER
Physical	ULP-02-168	6	4	Prof. Dr. Eyüp ÖZDEMİR Prof. Dr. İsmet KAYA

Chemistry-II				Doç. Dr. Nurettin ŞAHİNER
Biochemistry I	ULP-02-169	6	4	Prof. Dr. Cahit AKGÜL
Biochemistry II	ULP-02-170	6	4	Prof. Dr. Cahit AKGÜL
Instrumental Analysis	ULP-02-171	6	4	Asoc. Prof. Dr. Yusuf DİLGİN
Organic Reaction Mechanisms I	ULP-02-174	3	2	Prof. Dr. Mehmet AY
Organic Reaction Mechanisms II	ULP-02-175	3	2	Prof. Dr. Mehmet AY Assoc. Prof. Dr. Fatih ALGI
Electrochemistry	ULP-02-176	3	2	Asoc. Prof. Dr. Yusuf DİLGİN
Synthesis Design in Organic Chemistry I	ULP-02-177	3	2	Assist. Prof. Dr. Şirin GÜLTEN
Heterocyclic Compounds I	ULP-02-178	3	2	Assist. Prof. Dr. Şirin GÜLTEN
Food Chemistry	ULP-02-179	3	2	Prof. Dr. Cahit AKGÜL
Organic Chemistry I	ULP-02-180	6	4	Prof. Dr. Mehmet AY Assoc. Prof. Dr. Fatih ALGI Assist. Prof. Dr. Şirin GÜLTEN
Organic Chemistry II	ULP-02-181	6	4	Prof. Dr. Mehmet AY Assoc. Prof. Dr. Fatih ALGI Assist. Prof. Dr. Şirin GÜLTEN
Thermodynamics	ULP-02-182	3	2	Prof. Dr. Eyüp ÖZDEMİR

Course Code	ULP-02-161
Name of the course in English	General Chemistry I
Name of the course in Turkish	Genel Kimya I

Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Eyüp ÖZDEMİR
ECTS Credits	6
COMU Credits	4
Description	This course includes following topics:  Structure of material and scientific measurements, structure of atom,periodic table,radioactivity,gases,solids

Course Code	ULP-02-162
Name of the course in English	General Chemistry II
Name of the course in Turkish	Genel Kimya II
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Eyüp ÖZDEMİR
ECTS Credits	6
COMU Credits	4
Description	This course includes following topics:  Liquids,solutions,chemical kinetics, acids and bases, pH and pOH, buffer solutions,thermodynamics and electrochemistry

Course Code	ULP-02-163
Name of the course in English	Inorganic Chemistry I
Name of the course in Turkish	Anorganik Kimya I
Language of the course	English

Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Yakup BARAN Assoc.Prof.Dr. Osman DAYAN Assist.Prof.Dr. Mustafa YILDIZ Assist.Prof.Dr. Ömer Faruk ÖZTÜRK
ECTS Credits	6
COMU Credits	4
Description	This course includes following topics:  Electronic Structure of the Atoms (Quantum theory of the atoms, multi electron atoms, periodic properties of the elements)  Molecular Structure (symmetry in molecules, point groups and applications)  Covalent bond (valance band and molecular orbital theory)  Ionic and metallic bond  Intermolecular Forces (effect of these forces)  Acid and Bases (solvent system, Hard-soft acid-bases theory, Lewis acid-bases)

Course Code	ULP-02-164
Name of the course in English	Inorganic Chemistry II
Name of the course in Turkish	Anorganik Kimya II
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Yakup BARAN Assoc.Prof.Dr. Osman DAYAN Assist.Prof.Dr. Mustafa YILDIZ Assist.Prof.Dr. Ömer Faruk ÖZTÜRK

ECTS Credits	6
COMU Credits	4
Description	<p>This course includes following topics:</p> <ul style="list-style-type: none"> <li>- Transition metals and coordination chemistry (properties of transition metals, geometry in coordination compounds, isomerism in coordination compounds)</li> <li>- Chemical bonds in coordination compounds (valence bond theory, Crystal field theory, molecular orbital theory)</li> <li>- Electronic spectrum of the coordination compounds (term symbols, electronic transitions, charge transfer bands)</li> <li>- Inorganic reaction mechanisms (substitution reactions, substitution in square planer structures, substitution reactions in octahedral complexes)</li> <li>- Organometallic chemistry (organometallics with carbon-sigma bonds, metal carbonyls, metal carbenes (M=C) and carbene complexes, catalysis)</li> </ul>

Course Code	ULP-02-165
Name of the course in English	Analytical Chemistry I
Name of the course in Turkish	Analitik Kimya I
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Asoc. Prof. Dr. Yusuf DİLGİN
ECTS Credits	6
COMU Credits	4
Description	<p>Introduction to Analytical Chemistry Errors in Chemical Analysis</p>

	<p>Random Errors in Analysis: Source of Random errors  Evaluation of Statistic of Results of the Analysis  Gravimetric Analysis Methods  Gravimetric Calculations, Properties of Precipitate and Precipitant, Applications  Titrimetric Analysis Methods  Aqueous Solution Chemistry  Equilibrium Calculations  Multi-equilibrium problems, solubility equilibrium calculations</p>
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Course Code	ULP-02-166
Name of the course in English	Analytical Chemistry II
Name of the course in Turkish	Analitik Kimya II
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Asoc. Prof. Dr. Yusuf DİLGİN
ECTS Credits	6
COMU Credits	4
Description	<p>Theory of Neutralization Titrations  Polyprotic Acids and Titrations Curves, Polyprotic Bases and Titration Curves  Applications of the Neutralization Titrations  Precipitate Titrations  Determinations with Standard Silver Nitrate Solution  Complex-Formation Titrations  Titrations with Aminocarboxylic Acids  Introduction to Electrochemistry  Redox Electrode Potentials  Applications of the Standard Electrode Potentials Redox Titrations Curves Applications of the Oxidation/Reduction Titration</p>

Course Code	ULP-02-167
Name of the course in English	Physical Chemistry-I
Name of the course in Turkish	Fizikokimya-I
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Eyüp ÖZDEMİR Prof. Dr. İsmet KAYA Doç. Dr. Nurettin ŞAHİNER
ECTS Credits	6
COMU Credits	4
Description	Gases (ideal gases, kinetic theory of gases, real gases), Zeroth and First Laws of Thermodynamic (basic concept, heat and work, enthalpy), Thermochemistry and Applications of First Laws (state functions and exact differentials), Second and Third Laws of Thermodynamic, (Entropy, Helmholtz and Gibbs Energies) Combining First and Second Laws, Real Gases and Fugacity, Physical Transformations of Pure Substances (phase diagrams, phase transformation, physical liquid surface) Properties of Simple Mixtures (thermodynamical definition of mixtures, properties of solutions, activity) Phase Diagrams (phase, phase rules, two component systems), Colligative Properties (vapour pressure lowering, freezing point depressing, boiling point elevation, osmotic pressure).

Course Code	ULP-02-168
Name of the course in English	Physical Chemistry-II
Name of the course in Turkish	Fizikokimya-II
Language of the course	English
Level of Course	Bachelor's / Undergraduate

Lecturer	Prof. Dr. Eyüp ÖZDEMİR Prof. Dr. İsmet KAYA Doç. Dr. Nurettin ŞAHİNER
ECTS Credits	6
COMU Credits	4
Description	Chemical Thermodynamic, Thermochemistry, Chemical Equilibrium, Surface Chemistry and Colloids (interfaces, adsorption and colloid chemistry), Chemical Kinetics (basic concepts and simple reaction kinetics, complex reaction kinetics), Catalysis, Photochemistry and polymer Chemistry, Crystal Structures, Fundamental Basis for Crystal and Some of Their Properties, Nuclear Chemistry (basic concepts in atom and nucleus, radioactivity, binding energy), Radiochemistry and Radiation Chemistry, Nuclear Reactions, Radioactive Decays, Applications of Isotopes, Fission and Fusion.

Course Code	ULP-02-169
Name of the course in English	Biochemistry I
Name of the course in Turkish	Biyokimya I
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Cahit AKGÜL
ECTS Credits	6
COMU Credits	4
Description	This course includes following topics: amino acids, proteins, enzymes, vitamin & coenzymes, carbohydrates, lipids, glycolysis, gluconeogenesis, glycogen metabolism, fatty acid metabolism, Crebs Cycle



Course Code	ULP-02-170
Name of the course in English	Biochemistry II
Name of the course in Turkish	Biyokimya II
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Cahit AKGÜL
ECTS Credits	6
COMU Credits	4
Description	This course includes following topics: Electron transport chain and oxidative phosphorylation, amino acid metabolism, nitrogen metabolism and urea cycle, photosynthesis, nucleic acids, replication, transcription, translation

Course Code	ULP-02-171
Name of the course in English	Instrumental Analysis
Name of the course in Turkish	Aletli Analiz
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Asoc. Prof. Dr. Yusuf DİLGİN
ECTS Credits	6
COMU Credits	4
Description	<p>1- Spectroscopy: Introduction to Spectroscopy, Electromagnetic Ray</p> <p>2- Term in Use Absorption Spectroscopy, Absorption Laws, Instruments for Optical Spectroscopy</p> <p>3- Introduction to Molecular Uv-Vis and Near IR</p>

	<p>Absorption Spectroscopy</p> <p>4- Application of Uv-Vis Absorption Spectroscopy</p> <p>5- Luminescence Spectroscopy: Theory of Fluorescence and Phosphorescence, Chemiluminescence, Instruments, Application of Fluorescence and Phosphorescence</p> <p>6- IR and Raman Spectroscopy and their</p> <p>7- Nuclear Magnetic Resonance Spectroscopy</p> <p>8- Mass Spectroscopy and their applications</p> <p>9- Atomic Spectroscopy: Flame Atomic Absorption Spectroscopy, Electrothermal Atomic Absorption Spectroscopy and their applications</p> <p>10- Atomic Emission Spectroscopy, Inductively Coupled Atomic Emission Spectroscopy, Atomic Fluorescence Spectroscopy</p> <p>11- X-Ray Spectroscopy</p> <p>12- Chromatography: Introduction to Chromatography, Gas Chromatography and Applications</p> <p>13- High Performance Liquid Chromatography and Electrophoresis</p> <p>Electroanalytical Methods, Voltammetry, Potentiometry, Electrogravimetry,</p>
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Course Code	ULP-02-174
Name of the course in English	Organic Reaction Mechanisms I
Name of the course in Turkish	Organik Tepkime Mekanizmaları I
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Mehmet AY

ECTS Credits	3
COMU Credits	2
Description	Basic principles of organic reaction mechanisms: Chemical bonds, resonance structures, curly arrows, HOMOs and LUMOs, aromaticity, classification of organic reactions, Stereochemistry of reactions and asymmetric reactions, General review problems, Nucleophilic substitution, Aromatic electrophilic substitution, Electrophilic addition to double and triple bonds, Nucleophilic addition and addition-elimination to double and triple bonds between carbon and a heteroatom, General review problems, Molecular rearrangements.

Course Code	ULP-02-175
Name of the course in English	Organic Reaction Mechanisms II
Name of the course in Turkish	Organik Tepkime Mekanizmaları II
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Mehmet AY Assoc. Prof. Dr. Fatih ALGI
ECTS Credits	3
COMU Credits	2
Description	Elimination Reactions, Aromatic Substitution Reactions, Free Radicalic Reactions, Problem Solving, Rearrangements on Organic Molecules, Rearrangement and Cyclisation Reactions, Pericyclic Reactions, Oxidation Reactions, Reduction Reactions, Problem Solving, Organic Electrochemistry.

Course Code	ULP-02-176
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Name of the course in English	Electrochemistry
Name of the course in Turkish	Elektrokimya
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Asoc. Prof. Dr. Yusuf DİLGİN
ECTS Credits	3
COMU Credits	2
Description	<p>Introduction to Electrochemistry  Oxidation-Reduction Reactions  Electrochemical Cells, Nernst Equation, Electrode potentials, Applications  Theory of Oxidation/reduction Titrations  Applications of Redox Titration  Potentiometric Methods  Electrogravimetric and Coulometric Methods  Voltammetric and Polarographic Methods  The applications of voltammetric and polarographic techniques  Amperometry  Amperometric titrations  The applications on the amperometric methods  Conductometry Conductometric Titrations</p>

Course Code	ULP-02-177
Name of the course in English	Synthesis Design in Organic Chemistry I
Name of the course in Turkish	Organik Kimyada Sentez Tasarımı I
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Assist. Prof. Dr. Şirin GÜLTEN
ECTS Credits	3

COMU Credits	2
Description	This course introduces students to a new vocabulary and to concept that are used throughout designing organic syntheses. Course deal with various aspects of synthetic strategy, disconnection approach and methods. Definition of synthetic routes. Retrosynthesis, retrosynthetic reactions, synthons and retrons. Total synthesis of complex organic molecules.

Course Code	ULP-02-178
Name of the course in English	Heterocyclic Compounds I
Name of the course in Turkish	Heterohalkalı Bileşikler I
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Assist. Prof. Dr. Şirin GÜLTEN
ECTS Credits	3
COMU Credits	2
Description	An introduction to the principle of heterocyclic chemistry with an emphasis on different heterocycles. Students will learn basic concepts in heterocyclic chemistry I. Apply these concepts to the chemistry of heterocycles.

Course Code	ULP-02-179
Name of the course in English	Food Chemistry
Name of the course in Turkish	Besin Kimyası
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Cahit AKGÜL

ECTS Credits	3
COMU Credits	2
Description	This course aims to introduce basic molecular structures and chemical reactions in foods: Water, Carbohydrates, Lipids, Proteins, Enzymes, Vitamins, Minerals, Natural toxic compounds and contaminants, Food additives

Course Code	ULP-02-180
Name of the course in English	Organic Chemistry I
Name of the course in Turkish	Organik Kimya I
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Mehmet AY Assoc. Prof. Dr. Fatih ALGI Assist. Prof. Dr. Şirin GÜLTEN
ECTS Credits	6
COMU Credits	4
Description	Basic Concepts of Organic Chemistry, Properties and nomenclature of Organic Compounds, Functional groups and their reactions need to be learned to design synthesis.

Course Code	ULP-02-181
Name of the course in English	Organic Chemistry II
Name of the course in Turkish	Organik Kimya II
Language of the course	English
Level of Course	Bachelor's / Undergraduate

Lecturer	Prof. Dr. Mehmet AY Assoc. Prof. Dr. Fatih ALGI Assist. Prof. Dr. Şirin GÜLTEN
ECTS Credits	6
COMU Credits	4
Description	Basic Concepts of Organic Chemistry, Properties and nomenclature of Organic Compounds, Functional groups and their reactions need to be learned to design synthesis.

Course Code	ULP-02-182
Name of the course in English	Thermodynamics
Name of the course in Turkish	Termodinamik
Language of the course	English
Level of Course	Bachelor's / Undergraduate
Lecturer	Prof. Dr. Eyüp ÖZDEMİR
ECTS Credits	3
COMU Credits	2
Description	This course includes following topics:  Principles of gases, introduction to heat transfer, first rule of thermodynamics, second rule of thermodynamics, third rule of thermodynamics, chemical kinetics, chemical equilibrium