KARAMANOGLU MEHMETBEY UNIVERSITY
KAMIL OZDAG SCIENCE FACULTY
CHEMISTRY DEPARTMENT

I. CLASS COURSE CONTENTS

FIRST SEMESTER

General Chemistry I (4 2 0) (ECTS: 8)

Properties of Matter and Measurement. Atoms and The Theory of Atom. Chemical Compounds. Chemical Reactions. Introduction to Reactions of Aqueous Solutions. Gases. Thermochemistry. The Electronic Structure of Atom. Periodic Table and Some Properties of Atoms. Chemical Bonds I : Basic Concepts. Chemical Bonds II: Theory of Bondings. Liquids, Solids, and Intermolecular Forces.

Physics I (4 0 0) (ECTS: 5)

Physics and Measurement, Vectors, Motion in One Dimension, Motion in Two Dimensions, The Laws of Motion, Circular Motion, Work and Energy, Potential Energy and Conservation of Energy, Linear Momentum and Collisions, Rigid Body Rotation Around A Fixed Axis, Motion, The Law of Universal Gravitation, Fluid Mechanics.

Mathematics I (4 0 0) (ECTS: 5)

Numbers. Inequalities. Functions. Limit and Discontinuity. Derivatives. Exponential and Logarithmic Functions. Applications of Derivatives.

General Chemistry Laboratory I (0 0 4) (ECTS: 4)

The Physical Properties of Substances and The Definition of Mixtures, Diffusion of Gases, Determination of The Properties of Matter, Crystallization and Fractional Crystallization, Stoichiometry, Freezing Point Depression and The Presence of Molecular Weight, Equivalent Weight of Magnesium, Chemical Reaction Types, Acid-Base Titration, The Effect of Temperature on Reaction Rate, Gas Constant Determination.

Laboratory Techniques (2 0 0) (ECTS: 2)

Converting The Units to Each Other, Solution Concepts, Concentration, Molarity, Normality, Examples Related to ppm Calculations. The Introductiono Tools and Equipment Used to Analyze in Chemistry Laboratories, Introduction of Laboratory Matters and Materials, Practical Teaching of Calculations for The Preparation of Solutions Used in Analysis.

Usage of Basic Information Technology (1 2 0) (ECTS: 2)

The Introduction of Terms and Properties of Basic Software and Hardware. The Main Commands in Dos and Windows Operating Systems. Use of Office for Windows (Word, Excel, Power Point). Internet and The Internet Network. To Do Research on The Internet.

University Life (0 1 0) (ECTS: 1)

General Presentation of The University, The University's Administrative Staff, Faculty and Department Presentation, Presentation of The City Administrative and Civilian Supervisors, Students and The Relevant Regulations, Conferences, Meetings.

Princpiles of Atatürk and Revolution History I (2 0 0) (ECTS: 1)

To Bring Up Turkish Youth as; Being Aware of The National, Humanitarian, Spiritual and Cultural Consciousness, Being A Member of The Republic of Turkey which The Great Ataturk Founded, being on The State of Knowledge of The Duties and Responsibilities Against The Turkish State, Believing that The Turkish State is an Indivisible Whole with Its Nation and State, Being Rightly Proud of These Statements.

Turkish Language I (2 0 0) (ECTS: 1)

Development of The Turkish Language, The Date Today. Geographical Spread of The Turkish Language. Review Areas of The Turkish Language. Turkish General Properties of Sound and Shape.

English I (2 0 0) (ECTS: 1)

Opening Strategies (Unıt 1- Unıt 5) Subject Pronouns, Possessive Adjectives, Nouns and Plurals, Demonstrative Adjectives and Some Adverbs, Present Tense, and The Verb To Be and Its Positive, Negative and Question Constructions. Conjunctions, Sign Pronouns, and Indefinite Letter Description, Nounals and Object Pronouns. Inflection Auxiliary Verbs "Can" and The Use of It With Examples.

SECOND SEMESTER

General Chemistry II (4 2 0) (ECTS: 8)

Solutions and Their Physical Properties. Chemical Kinetics. Chemical Equilibrium Principles. Acids and Bases. Acid-Base and Solubility Equilibria. Spontaneous Change: Entropy and Free Energy. Electrochemistry. Nuclear Chemistry. Organic Chemistry.

Mathematical Methods In Chemistry (3 0 0) (ECTS: 5)

Introduction, The International Unit System (Si), Significant Numbers, Dimensional Analysis, The Reliability of The Measurements, Measure The Uncertainties and Deviations from The Mean and Average Deviation, Standard Deviation, The Graphical Representation, The Graphic Features, The Least Squares Method, Correlation Coefficient, Interpolation and Extrapolation, Differential Calculus, Limits The Account, A Simple Derivative of The Functions, Indoor Derivatives, Logarithmic and Exponential Functions, Turning Points, The Maximum, Minimum and Bending Points, The Series, L'hopital's Rule to Evaluate The Limit, or More than Three-Dimensional Differential Calculus, Partial Derivatives, Total Differential, Full and Partial Derivatives of The Relations Between Differential and Integral Calculus, The Standard Integration Methods, Simple Functions, Not Fragment by The Method of Integration, A Simple Method of Partial Fractions, Algebraic Functions, Conversion Method, Multiple Integrals, Applications of Integrals, The Plane Area, Area Under The Curve, Finding Applications of Integral Differential Equations, and to Show The Meaning of The First-Order Equations, First Order Separable Variables, Homogeneous First Order Equations, Exact Equations, First Order Linear Equations.

Physics II (4 0 0) (ECTS: 5)

Electric Fields, Gauss' Law, Electric Potential, Capacitance and Dielectrics, Current and Resistance, Dc Circuits, Magnetic Fields, Magnetic Field Sources, Faraday's Law, Inductance, Alternating Current Circuits, Electromagnetic Waves.

Mathematics II (4 0 0) (ECTS: 5)

Integrals. The Domain Account. Definite Integral. Integral Techniques. Applications of Integrals. Sequences and Series. Functions of Several Variables. Multiple Integrals.

General Chemistry Laboratory II (0 0 4) (ECTS: 4)

Essential Information and Guidelines in The Laboratory, Conservation of Mass; Detection of Substance by Physical and Chemical Properties, Determination of Density of Solids and Liquids; Sublimation and Distillation Experiments; Melting and Boiling Point Determination; Molecular Mass Determination of A Metal, Thermal Decomposition of Potassium Chlorate; Determination of CuO Amount in Copper (II) Carbonate; Determination of The Crystal Water of Coppersulfate Pentahydrate; Determination of Molar Volume of Gase.

Princpiles of Atatürk and Revolution History II (2 0 0) (ECTS: 1)

The Life of Mustafa Kemal Atatürk, Being an Inspesctor in Army, Landing on The Samsun, Amasya Circular, Erzurum and Sivas Congress, Arrival of Admiral Mustafa Kemal to Ankara, Opening of The Last Ottoman Parlement, Decleration of National Pact, TBMM Period.

Turkish Language II (2 0 0) (ECTS: 1)

Investigations in Literary and Intellectual Work, Studies on The Sentence, Talks on The Richness of Turkish Language.

English II (2 0 0) (ECTS: 1)

Openıng Strategıes (Unıt 6-Unıt 10) Countable and Uncountable Nouns, Adverbs of Time, Indefinite Pronouns, Imperatives, Prepositions of Time, Exclamation Phrases, Adverbs of Frequency, Noniflection Auxiliary Verbs "Would" with The Colors, Days, Months, and Associated Text Studies. The Present Tense and "To Be" Tense With Past Tense. (Have Got) The Use of The Examples.

II. CLASS COURSE CONTENTS

THIRD SEMESTER

Analytical Chemistry I (4 0 0) (ECTS: 7)

Basic Principles of Analytical Chemistry, Errors in Chemical Analysis, Gravimetric Analysis Methods, Titrimetric Analysis Methods, Chemistry of Aqueous Solutions, Ionic Equilibrium, Complex Equilibrium Systems, Theory of Acid-Base Titrations.

Analytical Chemistry Laboratory I (0 0 6) (ECTS: 4)

The Semi-Micro Qualitative Analysis of Cations And Anions.

Inorganic Chemistry I (4 0 0) (ECTS: 7)

Si Units, The Structure of The Atom: Atom, Hydrogen Atom and Bohr's Theory, Particle and Wave Character Electron, Heisenberg's Uncertainty Principle, Quantum Model and The Schrödinger Wave Equation, The Many-Electron Atoms, Pauli Principle, Slater and Hunt Rule, Aufbau Rule, The Energy Level of Atom, Periodic Properties of Elements: The Size of Atoms and Ions, Ionization Energy, Electron Affinity, Electronegativity, Introduction to Bonding in Chemistry: Ionic, Covalent Bonding, Lewis Formulas, Resonance, Metallic, Covalent Bonding: Lewis Theory, VBT, Hybridization, Combination of Atomic Orbitals, Molecular Geometry.

Organic Chemistry I (3 0 0) (ECTS: 7)

Structure and Properties, IR Spectroscopy, Classification and Nomenclature, Radical Substitutions, Stereoisomerism, Nucleophilic Substitutions, Separation Reactions, Electrophilic and Radical Addition Reactions, Alkenes, Alkynes, Alcohols, Ethers, Epoxides.

Professional English I (2 0 0) (ECTS: 2)

Scientific and chemical terms, chemical terminologyas telling student in General Chemistry I Course taught in English.

Organic Chemistry Laboratory I (0 0 6) (ECTS: 3)

Melting and Boiling Point Determination, Crystallization and Sublimation, Production of Caffeine From Tea, 2-Methyl-2-Butene Synthesis, Synthesis of Aspirin, The Synthesis of Iso-Amilasetat, Iodoform Reaction, Synthesis of Soap, Sulphanilic Acid Synthesis, Cannizzaro Reaction, Asetanilit Synthesis

FOURTH SEMESTER

Analytical Chemistry II (4 0 0) (ECTS: 7)

Complex Acid-Base Systems, Applications of Acid-Base Titrations, Precipitation Titrations, Complex Formation Titrations, Electrochemistry, The Electrode Potential, Applications of Oxidation-Reduction Titrations.

Professional English II (2 0 0) (ECTS: 2)

Teaching scientific and chemical terms, chemical terminology by giving General Chemistry II Course in English

Analytical Chemistry Laboratory II (0 0 6) (ECTS: 4)

Determination of The Composition of Unknown Samples by Gravimetric and Volumetric Methods. Volumetric Methods Include; Acid-Base, Complexometric, Redox, and Precipitation Titrations.

Organic Chemistry II (3 0 0) (ECTS: 7)

Aromatic Compounds, Aldehydes and Ketones, Carboxylic Acids and Derivatives, Conjugated Addition, Enolates and Carbanions, Amines, Multi-Ring Aromatic and Heterocyclic Compounds, Pericyclic Reactions, NMR and Mass Spectroscopy.

Organic Chemistry Lab. II (0 0 6) (ECTS: 3)

Synthesis of Phtalimit, Synthesis of Methyl Orange. Recovery of Lymonen. Oxidation of Alcholos. Elemental Analysis. Functional Group Analysis. Preparation of Derivatives. Unknown Sample Analysis.

Inorganic Chemistry II (4 0 0) (ECST: 7)

Solids: Crystal Structure and The Determination of Avogadro's Number, Ionic Solids, Covalent Solids, Molecular Solids, Radius Rates, Lattice Energy, Born-Haber Conversion; Metals: Physical Properties, Bonding Theories of Metals, Conductivity, Intermolecular Forces: Van Der Waals, London Repulsion Forces, Hydrogen Bonding, Acids and Bases: The Classical Approach, The Lewis Definition, Concept of Hard-Soft Acid-Base, Coordination Compounds: Werner Theory, Nomenclature of Coordination Compounds, Isomerism, Effective Atomic Number Rule, Valence Bond Theory, Molecular Orbital Theories, The Magnetic Properties of Coordination Compounds, Ligands.

III. CLASS COURSE CONTENTS

FIFTH SEMESTER

Biochemistry I (3 0 0) (ECTS: 6)

Water, Carbohydrates: Structure and Biological Functions; Lipids: Structure and Biological Functions; Amino Acids, Peptides and Proteins: Structure and Biological Functions; Enzymes and Enzyme Kinetics; Vitamins and Coenzymes, Nucleic Acids: Structures and Biological Functions.

Instrumental Analysis (3 0 0) (ECTS: 6)

Principles of Spectroscopic Methods, Electromagnetic Radiation, Molecular Uv-Visible Absorption Spectroscopy, Molecular Fluorescence / Phosphorescence Spectroscopy, Infrared Absorption Spectroscopy.

Physical Chemistry I(4 0 0)(ECTS: 7)

Systems, States and Events, Macroscopic Examination of Gases and Liquids, Work, Heat, Energy, First Law of Thermodynamics, Second and Third Laws of Thermodynamics, Entropy, Thermodynamics of Real Systems, The Criteria for Spontaneous Events, Gibbs Energy Calculations, and Identification of Open to Multi-Component Systems, Chemical Equilibrium.

Inorganic Chemistry Laboratory I (0 0 4) (ECTS: 2)

Synthesis and Determination of Characteristics of Some Basic Ionic Compounds, Metal Oxides, and Covalent Compounds and Double Salts, by Gravimetric, Volumetric and Conductometric Methods: Oxides: Chromium (III) Oxide, Copper(I) Oxide, Calcium Peroxide, 0.4 And 8 Hydrate; Salts: Tin (II) Chloride Dihydrate and Anhydrous, Ammonium Permanganate, Potassium Monoklorkromat, Sodium Thiosulfate, Lead Iodide, Magnesium Sulfate Heptahidrat; Covalent Compounds: Tin (Iv) Iodide, Barium Bromate, Iron (II) Oxalate, Copper (I) Iodide, Boron Acetate.

Food Chemistry (2 0 0) (ECTS: 3)

Water; Sorption Phenomena, Water Types, Water Activity and Nutrient Degradation and Water Binding of Meat. Lipids, Fatty Acids, Glycerides Compounds, Ester Exchange, Phospholipids, Unsaponifiable Substances, Autooxidation, Heated Oils, Flavor Transformations, Hydrogenation of Oils. Protein, Amino Acid Composition, Protein Classification, Protein Structure, Denaturation, Animal Proteins, Vegetable Proteins. Carbonhydrates, Monosaccharides, Oligosaccharides, Caramelization, Crystallization, Polysaccharides.

Dyestuffs (2 0 0) (ECTS: 3)

What Is Color? Color Theory, The Relationship Between Colour and Dye, Paint and Dye, Classification of Dyes, Information on A Variety of Chemical Classes of Dyes. Azo, Anthraquinone, Di and Tri Aryl Methane, Acridine, Fenazine, Oxazine, Tiazine. Thiazole, Indigo, Disperse, Sulfur, Nitrogen and Natural Dyes.

Corrosion Chemıstry (2 0 0) (ECTS: 3)

Economic and Social Approach Corrosion. Theories Valid for Aqueous Corrosion Environments. Electrochemical and Chemical Fundamentals of Aqueous Corrosion Media, Corrosion Reactions. Types of Corrosion (Galvanic Corrosion, Selective Corrosion, Hollow or Pit Corrosion, Erosion Corrosion). Basic Principles for Corrosion Control. Metal Oxide-Film Growth Mechanism and The Effect of Temperature. Corrosion Protection Barrier Coatings. Some of The Corrosion Properties of Metallic Materials. Cathodic and Anodic Protection Against Corrosion.

Chemistry of Metals (2 0 0) (ECTS: 3)

Classification of Metals. Electronic Structure and Reactivity of Metals. The Crystal Structure and Physical Properties of Metals, Chemical Bonding in Metals. Interaction of Metals with Acid and Nonmetals. Metals, Alloys and Intermetallic Compounds. Corrosion of Metals. Chemistry of s-, p-, d- and f-Metals.

Environmental Chemistry (2 0 0) (ECTS: 3)

Introduction to Environmental Chemistry. Components of The Atmosphere, Chemical and Photochemical Reactions in The Atmosphere, Global Warming, Greenhouse Effect, Photochemical Smoke, Acid Rain, Air and Air Pollution, Air Quality Testing, Water and Water Pollution, Water Quality Determination, Soil and Soil Pollution, Radioactive Substances and Reactions, Radioactive Waste.

Industrial Inorganic Chemistry (2 0 0) (ECTS: 3)

Basıc prıncıples and problem-solving strategies for chemical applications in industry. Courses covered include: economic evaluation of chemical processesunıt operatıons and flow charts; material and energy balances, separationtechniques, glass, ceramic, cement, fertilizer, petrochemical, products, paper chemicals such as detergent manufaturing methods.

Protein İsolation and Purification Techniques (2 0 0) (ECTS: 3)

General purification approaches. Protein extraction. Protein concentration. Chromatographic methods. Electrophoretic methods. Immunological methods. Crystallization. Chemical modifications.

SIXTH SEMESTER

Biochemistry II (3 0 0) (ECTS: 6)

Cell Information, Biosynthesis of Nucleic Acids, Biosynthesis of Nucleotide, Biosynthesis of Proteins, Metabolism of Amino Acid, Metabolism of Carbohydrate, Photosynthesis, Metabolism of Lipid, Hormones.

Physical Chemistry II (4 0 0) (ECTS: 7)

Ideal Solutions, Partial Molar Quantities, Activity, Phase Equilibria, Solid Liquid Phase Diagrams, Phase Diagrams of Three-Component, Transport Properties.

Instrumental Analysis II (3 0 0) (ECTS: 6)

Infrared Absorption Spectroscopy, Raman Spectroscopy, Nuclear Magnetic Resonance Spectroscopy, Electron Spin Resonance Spectroscopy, Mass, Atomic Absorption, Atomic Emission and Atomic Fluorescence Spectroscopy, Electrochemical Methods, Potentiometry, Conductivity and Polarography.

Instrumental Analysis Laboratory (0 0 4) (ECTS: 2)

Some Applications of Instrumental Methods of Analysis, UV-Visible Absorption, Flame Atomic Absorption and Emission, NMR, IR Spectroscopy, Polarography, Conductivity, and Potentiometric Titrations.

Enzyme Technology (2 0 0) (ECTS: 3)

Introduction to Enzyme Technology, Chemical Structure and The Active Center of Enzymes, Enzyme Catalyzed Reactions and Coenzymes, Enzyme Kinetics, Enzyme Activity and Analysis, Enzyme Classes, Industrial Enzyme Production, Immobilized Enzymes, Enzymes in Industrial Applications, Enzymes in Treatment and Drug Design, Use of Enzymes in Organic Synthesis.

Industrıal Nanotechnology (2 0 0) (ECTS: 3)

Introduction to nanometarials and nanotechnology, Nanotechnology samples from nature, production process of nanomaterials: sol-gel technique. Properties of nanomaterials: electrical, optical, superconductivity, magnetic and mechanical properties of nanomaterials. Characterization of nanomaterials. Methods of synthesis of nanoparticles. Applications of nanomaterials. Special nanomaterials: porous-silicium nano structures, biological nanomaterials, futures of nanomaterials.

Organic Reactions (2 0 0) (ECTS: 3)

Nucleophilic Substitution Reactions, Reaction Mechanisms, , Stereochemistry of Reactions, Factors Affecting Reactions Rates; Organic Synthesis: SN2 Reactions and Functional Group Conversions; Organic Synthesis: SN2 Reactions snd Functional Group Transformations; E2 Reaction; E1 Reaction; Xi Free-Radical Reactions, Reactions of Re-Regulation, Re-Arrangement Reactions, Pericyclic Reactions, Pericyclic Reactions.

Nuclear Chemistry (2 0 0) (ECTS: 3)

Radıoactıve elements, nuclear energy, and fiber optic lines,the acquisition and utilization of radıoisotopes, radiation effects and examines issues of prevention. Nuclear energy use to have knowledge and awarenes about the effects of nuclear radition.

Industrial Analysıs Technıquues (2 0 0) (ECTS: 3)

Sectors in Turkey chemical, paint food, textile, water, and waste water mining, and metallurgıcal analysis of issues, the Standard analysis techniques, analysis of soil and air samples.

Medicine Chemistry (2 0 0) (ECTS: 3)

General Information About Medicines (Sources, Properties, Preparations, Routes of Administration, Classification, Development of New Drugs) / Drug Analysis (Gravimetric, Titrimetric, Instrumental Methods) Applied Tests in Quality Control of Drugs / GMP and GLP Rules / Validation / Stability and Control of Drugs.

Nonmetals Chemistry (2 0 0) (ECTS: 3)

Identifier (Descriptive) Chemistry, The Characteristic Trends in The Periodic Table, Formation, Preparation, Production of Non-Metals, Atomic and Molecular Properties, Physical and Chemical Properties, Applications.

IV. CLASS COURSE CONTENTS

SEVENTH SEMESTER

Industrial Chemistry (3 0 0) (ECTS: 6)

Chemical and Physical Basic Operations. The Production of Chemical Substances, Tasks of Chemical Engineer and Chemist. Waste Water Purification and Environmental Pollution Control. Energy and Fuels. Coal Chemicals. Production of Industrial Gases. Ceramic Industries. Cement Industries. Glass Industries. Chlor-Alkali and Electrolytic Industries. Nitrogen Industries and Artificial Fertilizers. Sulfuric Acid and Hydrochloric Acid Industries. Nuclear Industries. Explosives and Rocket Fuel.

Polymer Chemistry (3 0 0) (ECTS: 6)

Introduction: The Concept of Polymer. Classification., Some Basic Concepts, Molecular Weight, Thermal Transitions, Thermosets and Thermoplastics. Stepwise Polymerization: General Reactions, Reactivity of Functional Groups, Carothers Equation, Molecular Weight Control, Characteristics, Typical Examples. Free Radical Addition Polymerization: Initiators, Growth and Termination Reactions, Thermodynamics. Ionic Polymerization: General Characteristics, Cationic Polymerization Reactions, Anionic Polymerization Reactions and Their Kinetics, Solvent and Counter Ion Effects. Other Polymerization Processes: Bulk, Solution, Suspension, Emulsion, Ring Opening, Plasma, Electrochemical.

Biochemistry Laboratory (0 0 4) (ECTS: 4)

Reactions of Carbohydrates, Hydrolysis of Starch, Reactions of Proteins, Reactions of Nucleic Acids, Physical and Microscopic Examination of Urine, Glucose, Ketone, and Protein in Urine, Creatinine, and Determination of Bile Dyes, Reactions of Lipids, Determination of Casein and Lactose in Milk, Glucose in Blood, Determination of Total Lipid, Total Protein, Calcium, Uric Acid, and Urea in Blood, Liver Function Tests, The Substrate Concentration Effect on The Rate of Biochemical Reactions.

Physical Chemistry Laboratory (0 0 4) (ECTS:5)

Introduction, Determination of Enthalpy of Dissolution of Ammonium Oxalate, Saponification of Ethyl Acetate, The Determination of Molecular Weight by The Viscosity Method, Molecular Weight Determination by Boiling Point Elevation, The Determination of Molecular Weight Victor-Meyer Method, Homogeneous Equilibrium, Determination of Partial Molar Volume, Law of Distribution, Determination of Enthalpy of Vaporization, Refractive Index.

Atomic and Molecular Chemistry (2 0 0) (ECTS:3)

This Course is Aimed to Cover Basic Topics of Inorganic Chemistry such as; Atomic Structure, Molecular Structure, Chemical Bonding Theories.

Spectroscopic Methods In Organic Chemistry (2 0 0) (ECTS:3)

Ultraviolet and Visible Absorption Spectra, Infrared Spectra, Sample Preparation, The Characteristic Group Frequencies of Organic Compounds, Spectrum Interpretations. 1H-NMR And 13C-NMR Spectra, Sample Preparation, Factors Affecting Chemical Shift, Spin-Spin Pairing, Interpretation of The First-Order Spectra. Mass Spectra, Determination of Molecular Formula, Molecular Ion Peaks, Interpretation of Mass Spectra. The Evaluation of Structure With UV, IR, NMR and Mass Spectra.

Quantum Chemistry (2 0 0) (ECTS:3)

The purpose of quantum chemistry; using wave mechanics to explain structure of atoms and molecules in theory. Taking the andvantage of the Free, one-dimensional box and three dimensional particle models explained electrone behaviors, to explained the movement of molecules taking the advantage of the rigid rotors and harmonic oscillator. Schrödinger equation by taking advantage of some postulate, the calculation of atomic orbitals and molecular orbitals.

Water and Technology (2 0 0) (ECTS:3)

Physical and Chemical Properties of Water, Solubility and Solubility Product, Effect of Water on Layers of The Soil, Natural Water, Sea Water, Gas Transfer, Drinking and Household Waters, Aquatic Toxic Metabolites, Hard and Soft Water, Water Disinfection, Physical and Chemical Analysis of Water.

Electroanalytical Chemistry (2 0 0) (ECTS:3)

Migration of ion and conductivity in the electrolyte solution, transport numbers, reference and metal indicator electrodes, membrane electrodes (glass, liquid and crystalline), the standart electrode potentials, cell potentials, Nernst equation, the liquid contact potential, the potential effect on current in the electrolyte cells (ohmic drop, the polarization effects), potentiometric titrations, electrogravimetry, coulometry, the electrodes used for electrolysis, supporting electrolytes, solvents, the types of working electrodes, the basic principles and comparison of voltammetric methods.

Textile Chemistry (2 0 0) (ECTS:3)

Wet and Dry Finishing Operations, Washing and Rinsing, Drying, Sizing and Sizing Removal, Bleaching and Mercerization, Cellulose, Regenerated Cellulose, Finishing of Wool and Synthetic Textile Material, Textile Dying, Chemical Interaction of Fiber with Dye, Chemical Finishing Processes (Finishing)**.**

EIGHTH SEMESTER

The Industrial Chemistry (3 0 0) (ECTS:6)

Agricultural chemical material industries. Food additives, oils and fats, waxes. Soap and detergent industry. Sugar and starch industries. Fermentation industries. Wood chemical materials and paper manufacturing, plastic industries. Synthetic fiber and film industries. Rubber industries, petroleum refining. The production of petrochemicals, dyestuffs.

Polymer Chemistry (3 0 0) (ECTS:6)

Copolymerization: General Properties, copolymerization equation, ratios of monomer reactivities, synthesis of block and graft copolymerizations. Stereochemistry of polymers, structure, orientation, configuration, geometric isomers, stereoregular polymerizations. Polymer solutions, thermodynamics of polymer solutions, ideal and nonideal solutions, Flory-Huggins Theory, molecular weight, types of molecular weight and molecular weight analyses. end-group analyses, colligative properties, light scattering, refractive index, ultrasantrifuge, viscosity, gel-permeation chromatography, thermal analysis. Mechanical properties: viscoelastic deformation, stress-strain interactions ve various deformations. Structure-Feature relationships: random copolymers, block copolymers, and carbon fibers.

Coordination Chemistry (3 0 0) (ECTS:5)

Basic concept of coordination chemistry. General feature of the side goup elements. Nomenclature and isomerism in coordination chemistry. The first studies in coordination chemistry, Werner Model. Coordination models of covelent bonds. Reaction mechanisms in coordination compounds and and their application areas.

Polymer Chemıstry Laboratory (0 0 4) (ECTS:2)

End Group Analyses, colligative properties, light scaterring, refractive index, ultrasantrifuge, viscosity, gel-permeation chromatography. Mechanical properties: viscoelasticity, stress-strain relationships and various deformations. Structure-Feature relationships: random, block copolymers, carbon fibers.

Colloid Chemistry (2 0 0) (ECTS:3)

Colloid chemistry course, colloid definition and classification, surface and colloid chemistry, colloidal solution preparation, hydrophilic and hydrophobic colloids, capillarity, kinatics of colloids, Tyndall effect, the viscosity of collidal solutions, the stability of colloidal solutions, gels and emulsions, the dialysis of colloidal particles, sols, foam. The preparation and stability of colloids, flocculation, micelle aggregates, surface tension, adsorption, electrophoresis, the Tyndall effect on the different colloidal solutions, wetting, lubrication, colloid properties, foam information, and the porperties of adhesion, molecular weight, micelle emulsion and isoelectric point.

Heterocyclic Compound (2 0 0) (ECTS:3)

Introductıon to heterocyclic compounds, nomenclature of heterocyclic compounds, heterocyclic aromatic systems, synthesis of 3 and 4 ring heterocyclic compounds,pyrrole synthesis and reactıons,furan synthesis and reactıons,pyridine and reactions,benzothiophene synthesis and reactıons,benzofuran synthesis and reactions, synthesis of five and six ring compounds containing two hetero atoms.

Chemistry of Artifical Fibers (2 0 0) (ECTS:3)

Basic concepts, development of the fiber chemistry, synthetic fiber and fiber industry in Turkey, inputs, polymers and their general properties, the properties of fiber; geometric properties, physical properties, chemical properties; the structure of polymer which is suitable for production of fiber; crystalline, orientation, stretch-drawing process, the molar mass and chain shape, the linear symmetry, moleculer flexibility, fiber pull methods; dope-tensile, from solution tensile, the natural fiber; animal fibers, vegetable fibers, inorganic fibers, semi-artifical textile fibers; regenerated cellulosic fibers, cellulosic fibers, degenerated protein fibers, artifical fibers; polymide fibers, polyester fibers, acrilic and modacrylic fibers, olefin fibers, vinyl and vinylidene fibers, elestromeric fibers, polyurea fibers, polyester-ether fibers, inorganic fibers, the analysis of fibers; preliminary observations, macroscopic methods, physical methods, chemical methods, organic dyestuff.

Electrochemistry (2 0 0) (ECTS:3)

Electrolyte solutions at equilibrium, kinetics of electrode processes, electrode equilibria, potentiometric techniques, conductometric techniques, corrosion, polarographic and voltammetric techniques.

Chemical Kinetic (2 0 0) (ECTS:3)

The reaction rate, reaction order and molecularity of the reaction rate constant, the determination of the degree of reaction, the effect of temperature on reaction rate and activation energy, collision theory, the theory of absolute reaction rates, the solution of the kinetic study of reactions, complex reactions, chain reactions, catalysis, adsorption kinetics, enzyme reactions, photochemistry.

Quality and Standart (2 0 0) (ECTS:3)

Standart, standardization and its benefits, standardization activities in Turkey, certification Works (product certification, system certification), accreditation and conformity assessment activities, the EU new approach directives and CE conformity marking, the concept of quality and quality systems, the system standards (TS EN ISO 9001, TS EN ISO 14001, TS 18001, TS EN ISO 22000), Total Quality Management.