AKDENİZ UNIVERSITY
GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
DEPARTMENT OF CHEMISTRY
COURSE CONTENT OF
THE PHD PROGRAM

70303601 SILICONE TECHNOLOGY

Chemical structure of silicones, synthesis of silanes, chemistry of organomodified silanes and technological usage.

730303602 CERAMIC CHEMISTRY

Structure of ceramics, thermochemistr of ceramics, ceramic systems, properties of ceramics, synthesis of ceramic systems, special ceramics.

730303605 ADVANCED SEPARATION PROCESSES

Properties and uses of the separation techniques, single equilibrium processes, the factors effecting the purity of the producs, multistage separation processes, multistage separations of the feeds with two components, distillation, multistage separations of the feeds with multicomponens. Liquid-luquid separations, rates of mass transfer, The efficiency of the contacted separation devices, stage efficieny

.

730303604 GROUP THEORY AND CHEMICAL APPLICATIONS

Introduction to symmetry. Basic concepts of group theory. Point groups of molecules. Representations of the groups. Group theory and quantum mechanics. investigation of MO theory by group theory. Spectroscopy and molecular vibrations in group theory.

730303606 STABILITY OF FOOD PRODUCTS

Open-dating. basic deterioration and preservation means of foods. Scientific investigation of shelf-life. Methods used in shelf-life determination. Review of studies for open-dating of foods and food products such as cerals, flour, macaroni, snack-foods, poultry, fresh meat, fish, milk products, canned and frozen fruits and vegetables, concentrated fruit juices, coffee and tea.

730303608 THERMODYNAMIC PROPERTIES OF WATER SORBTION IN FOODS

Basic concepts related to water activity. Measurement of water activity. Critical evaluation of methods fro moisture contect determination. General properties of moisture sorption isotherms. Uses of moisture sorption isotherms in various areas: crispness and hardness, packaging predictions, storage conditions, dry ingredient mixing.

730303609 ADVANCED CHEMICAL THERMODYNAMICS

The laws of thermodynamics, thermochemistry and its applications, bond energies, calorimetry, heat of reactions, partial molar quantities, statistical thermodynamics, Maxwell demon chemical equilibrium, homogenous and hetereogeneous equilibria

730303610 STATISTICAL THERMODYNAMICS

The fundamental principles of statical thermodynamics, an assembly of independent localised particles, atomic crystals: the Einstain treatment and the Debye modification, an assembly of non-localised particles, the partition functions for independent non-localiesd molecules and the properties of gaseous systems, the caonical and grand canonical ensembles.

730303611 OLEFIN METATHESIS AND METATHESIS POLYMERİZATİON

The olefin metathesis reaction, catalyst systems, the metal carbene/ metallacyclobutane mechanism, ethene and terminal alkenes, acyclic disubstituted and trisubstituted ethenes, acyclic functionalized alkenes, acyclic dienes, acetylenes, ring-opening metathesis polymerization, monocyclic alkenes and polyenes, polycyclic alkenes, cross-metathesis between cyclic and acyclic olefins, applications of the olefin metathesis reaction

730303612 KINETICS OF ENZYMES

General kinetics principles of enzyme reactions, steady-state approach in enzyme kinetics, reactions with two substrates, effect of hydrogen ion concentration, molecular kinetics, kinetic isotope effect, mechanisms in enzyme reactions, immobilized enzyme systems.

730303613 ORGANOMETALLİC CHEMISTRY

Historical development and current trends in organometallic chemistry, energy, polarity and reactivity of the M-C bond. Reactions and synthesis of organometallics, usage of organometallics in industry.

730303614 CHEMISTRY OF CARBOHYDRATES

Structural analysis: Stereochemistry, conformation, conformational analysis, optical methods of structural analysis, carbohydrate conformations, Carbohydrate reactions at C - 1, Reactions of chain hydroxyles, Structural analyses with periodate and lead tetraacetate, Methyllation techniques, Chemistry of amino sugars, Polysaccharides.

730303616 NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

Theory of the NMR, Chemical shift, Spin-spin coupling, Analysis of complex spin systems, 1H-NMR, 13C-NMR: applications and interpretation of the spectrum, Two dimensional NMR spectroscopy techniques: COSY, HETCOR, INADEQUATE

730303617 ORGANIC RADICALS

Historical and definition of radicals, classification of radical reactions, carbon, nitrogen and oxygen centered long lived radicals, radical initiators, addition of radicals to aliphatic unsaturated systems, homolytic aromatic substitution, radicals in synthesis and biosynthesis, detection of radicals (NMR, ESR or EPR and CIDNP).

70303618 COLLOID CHEMISTRY

This course includes the colloidal systems and their properties. The main topics covered in this course are; The colloidal state, classification of colloidal systems, preparation and

purification of colloidal solutions, kinetic and optical properties of colloidal systems, interface systems (liquid-gas, liquid-liquid, solid-gas, solid-liquid), charged interfaces, stability of disperse systems, rheology (viscosity, non-Newtonian flow, viscoelasticity) and the properties of emulsions, foams and aerosol.

730303624 CONDUCTING POLYMERS

Introduction, Basic definitions, classification of polymers. Chemical, physical and electrical properties of conducting polymers. Synthesis and characterization, chemical and electrochemical methods. Applications of conducting polymers, electrochromic devices, light emitting diodes, solar cells, sensors, biosensor, nano-wires.