Rayat Shikshan Sanstha's

Annasaheb Awate Arts, Commerce & Hutatma Babu Genu Science College, Manchar

Tal. Ambegaon, Dist. Pune

DEPARTMENT OF CHEMISTRY

T.Y.B.Sc.

Course	Course Outcomes
Semester V	
DSEC-I: CH-501: Physical Chemistry- I	After successfully completion, students will be able to: 1. Know historical of development of quantum mechanics in chemistry. 2. Understand and explain the differences between classical and quantum mechanics. 3. Understand the idea of wave function 4. Understanding of De Broglie hypothesis and the uncertainty principle 5. Electromagnetic spectrum, Nature of wave and its characteristics such as wavelength, wave number, frequency and velocity, Energy level diagram, 6. Classification of molecules on the basis of moment of Inertia, 7. Rotational spectra of rigid diatomic molecules, selection rules, nature of spectral lines. 8. Difference between thermal and photochemical processes. 9. Photochemical laws: Grothus - Draper law, Stark-Einstein law, 10. Quantum yield and reasons for high and low quantum yield, 11. factors affecting the quantum yield,
DSEC-I: CH-502: Analytical Chemistry- I	After completion of the course student should be able to 1. Define basic terms in gravimetry, spectrophotometry, qualitative analysis and parameters in instrumental analysis. Such as: Gravimetry, precipitation, solubility product, ionic product, common ion effect, precipitating agent, washing of ppt., drying and ignition of ppt., linearity range, detection limit, precision, accuracy, Sensitivity, Selectivity, Robustness and Ruggedness, electromagnetic radiations, spectrophotometry, Beers law, absorbance, transmittance, molar absorptivity, monochromator, wavelength of maximum absorbance, metal ligand ration, qualitative analysis, group reagent, dry tests, wet test, confirmatory test, recipitation, thermogravimetry, thermogram, percent wt. loss, differential thermal analysis, etc. 2. Identify important parameters in analytical processes or estimations. Example: minimum analyte concentration in particular method, reagent concentration in particular analysis (gravimetry, spectrophotometry, thermogravimetry), reagent for particular analysis, reaction condition to convert analyte into measurable form, drying and ignition temperature for ppt in gravimetry, heating rate thermogravimetry, wavelength in spectrophotometry, group reagent, removal borate and phosphate in qualitative analysis. 3. Explain different principles involved in the gravimetry, spectrophotometry, parameters in instrumental analysis, qualitative analysis. 4. Perform quantitative calculations depending upon equations student has studied in the theory. Furthermore, student should able to solve problems on the basis of theory. 5. Discuss / Describe procedure for different types analyses included in the syllabus. 6. Select particular method of analysis if analyte sample is given to him. 7. Differentiate / distinguish / Compare among the different analytical terms, process and analytical methods. 8. Demonstrate theoretical principles with help of practical. 9. Design analytical procedure for given sample.

	10. Apply whatever theoretical principles he has studied in theory during practical session in laboratory.
DSEC-I: CH-503: Physical Chemistry Practical – I	1. To determine the specific refractivity's of the given liquids A and B and their mixture and hence determine the percentage composition their mixture C. 2. To titrate Cu2+ ions with EDTA photometrically. 3. Titration of a mixture of weak acid and strong acid with strong alkali. 4. To determine the molecular weight of a high polymer by using solutions of different concentrations. 5. Analysis of Riboflavin from vitamin supplementary capsules / syrup / tablet sample by Photoflurometry 6. Analysis of the given vibration-rotation spectrum of HCl(g)
DSEC-II: CH-504: Inorganic Chemistry – I	Explain electroneutrality principle and different types of pi bonding. To understand about inert and labile complexes and stability of complexes in aqueous solutions To know trends in periodic properties of these elements w.r.t. size of atom and ions, reactivity, catalytic activity, oxidation state, complex formation ability, color, magnetic properties, non-stoichiometry, density, melting point, boiling point.
DSEC-II: CH-505: Industrial Chemistry – I	1) The students are expected to learn; Importance of chemical industry, Meaning of the terms involved, Comparison between batch and continuous process, Knowledge of various industrial aspects. 2) The students are expected to learn, Concept of basic chemicals, Their uses and manufacturing process, They should also know the physico-chemical principals involved in manufacturing process. 3) The students are expected to learn. 3)Sugar Industry: The students are expected to learn Importance of sugar industry, Manufacture of direct iii. Consumption (plantation white) sugar with flow diagram. Cane juice extraction by various methods, Clarification by processes like carbonation, vi. Sulphitation, Phosphatation, etc. Concentration of juice by using multiple effect evaporator system, Crystallization of sucrose by using vacuum pan by processes like carbonation, Sulphitation, vii. Phosphatation, etc. Concentration of juice by using multiple effect evaporator system, Crystallization of sucrose by using vacuum pan. Fermentation Industry- The students are expected to learn Importance, Basic requirement of fermentation process, Manufacturing of ethyl alcohol by using molasses and fruit juice. 4) The students are expected to learn, Different types of soap products, Chemistry of soap, Raw materials required for soap manufacture, Meaning of the term's Surfactants, Types of surfactants, Raw materials for detergents, Detergent builders, additives, Washing action of soap and detergents. 5) The students are expected to learn Dyes - Students should know about, Dyes: introduction, Dye intermediates, Structural features of a dye; Classification of dyes, Synthesis, Structures, properties and applications of dyes. Pigments: Students should know about Introduction, Classification and general properties of pigment, Production processes of zinc oxide and iron oxide.
DSEC-II: CH-506: Inorganic Chemistry Practical – I	Preparation of inorganic complexes and spot tests for metal ions and ligands Qualitative and confirmatory tests of inorganic toxicants of any four ions
DSEC-III: CH-507: Organic Chemistry - I	Define and classify polynuclear and hetreonuclear aromatic hydrocarbons. Synthetic applications ethyl acetoacetate and malonic ester To write the mechanism of some named rearrangement reactions and their applications

DSEC-III: CH-508: Chemistry of Biomolecules	Introduction to molecular logic of life: The student will understanding of Cell types, Difference between a bacterial cell, Plant cell and animal cell. Biological composition and organization of cell membrane, structure and function of various cell organelles of plant and animal cell. Concepts of biomolecules, Bonds that link monomeric units to form macromolecule. Carbohydrates: The student will understand the types of carbohydrates and their biochemical significance in living organisms, structure of carbohydrates and reactions of carbohydrates with Glucose as example. Properties of carbohydrates.
DSEC-III: CH-509: Organic Chemistry Practical-I	Perform the quantitative chemical analysis of binary mixture, explain principles behind it. Understand the techniques involving drying and recrystallization by various method. Synthesis of various organic compounds through greener approach.
CH-510 (A) : Introduction to Medicinal Chemistry	Upon completion of the course the student shall be able to understand, 1. The basics of medicinal chemistry, biophysical properties, overview of basic concepts of traditional systems of medicine. 2. Over view of the overall process of drug discovery, and the role played by medicinal chemistry in this process. 3. Biological activity parameters and importance of stereochemistry of drugs and receptors. 4. Knowledge of mechanism of action of drugs belonging to the classes of infectious and non-infectious diseases. 5. Enhancement of practical skills.
CH-511 (A): Environmental Chemistry	Importance and conservation of environment. Organic and inorganic pollutants Water quality parameters
Semester VI	
DSEC-IV: CH-601 : Physical Chemistry-II	1. Electrochemical cells: Explanation of Daniell cell, Conventions to represent electrochemical cells 2. Thermodynamic conditions of reversible cell, Explanations of reversible and irreversible electrochemical cell with suitable example 3. Weiss and Millers Indices, determination of Miller Indices 4. Bravais lattices, space groups, seven crystal systems and fourteen Bravais lattices 5. The Group Displacement Law, Radioactive Disintegration Series
DSEC-IV: CH-602 : Physical Chemistry-III	1. Meaning of the terms-Solution, electrolytes, nonelectrolytes and colligative properties 2. Lowering of vapour pressure of solvent in solution 3. Applying rate laws for solid state reactions 4. Results of kinetics studies 5. phenomena of photoconductivity
DSEC-IV: CH-603 : Physical Chemistry Practical-II	To determine the PKa value of given monobasic weak acid by potentiometric titration. Determination of Pka of given weak acid by pH metry titration with strong base To determine the molecular weight of a given polymer by turbidometry Analysis of crystal structure from X-ray diffraction spectra of any two compounds

DSEC-V: CH-604 : Inorganic Chemistry - II	To understand M-C bond and to define organometallic compounds Understand the phenomenon of catalysis, its basic principles and terminologies. Understand the role of metals in non-enzymatic processes.
DSEC-V: CH-605: Inorganic Chemistry - III	Student will learn the concept of acid base and their theories. Be able to solve simple problems based on Pauling's univalent radii and crystal radii. Different Zeolite Framework Types and their classification
DSEC-V: CH-606: Inorganic Chemistry Practical-II	Estimation of Na by flame photometry by calibration curve method. Purification of water using cation/anion exchange resin and analysis by qualitative analysis /conductometry. Solvent free microwave assisted one pot synthesis of pthalocynin copper (II) complex.
DSEC-VI: CH-607: Organic Chemistry-II	Students will learn the principle of mass spectroscopy, its instrumentation and nature of mass spectrum. Students will understand the principle of UV spectroscopy and the nature of UV spectrum. They will learn types of electronic excitations. Students will understand the principle of IR spectroscopy, types of vibrations and the nature of IR spectrum.
DSEC-VI: CH-608: Organic Chemistry-III	Chemistry of reactive intermediates (carbocations, carbanions, free radicals, carbenes, nitrenes, benzynes etc Introduction, Isolation, Classification. Citral- structure determination using chemical and spectral methods, Synthesis of Citral by Barbier and Bouveault Synthesis.
DSEC-VI: CH-609: Organic Chemistry Practical-II	Determination of functional group of organic compound from given IR spectra. Estimation of glucose Caffeine from tea leaves
CH-610 (A) : Chemistry of Soil and Agrochemicals	Know the different components and properties of soil. Know classification of soil on the basis of pH. Identify the problematic soil and recommend method for their reclamation. Know the different plant nutrients required for plants and their functions. Know the role of various fertilizers and manures required for plant growth. Know the various methods and their techniques in analysis of soil. Know importance of manures as compared to chemical fertilizers. Know various techniques to protect the plants. Have the knowledge of various pesticides, insecticides, fungicides and herbicides.
CH-611(A): Analytical Chemistry-II	Explain different principles involved in the analyses using solvent extraction, basics of instrumental chromatography, HPLC, GC, and atomic spectroscopic techniques. Perform quantitative calculations depending upon equations students has studied in the theory. Furthermore, student should able to solve problems on the basis of theory. Discuss / Describe procedure for different types analyses included in the syllabus. Select particular method of analysis if analyte sample is given to him.