

SIR C R REDDY COLLEGE FOR WOMEN ELURU

M.Sc Organic Chemistry

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CourseTitle	Course code	COs
General Chemistry-I	CHE101	CO1: Derivation and interpretation of Schrodinger wave equation and understanding the fundamental postulates of Basic quantum mechanics
		CO2: Development of operators for physically measurable properties and familiar with some Mathematical concepts of wave functions
		CO3: To solve the simple quantum mechanical problems such as simple harmonic oscillator, particle in one dimensional & three dimensional box , rigid rotor , simple Harmonic oscillator
		CO4: The basic principles of different spectroscopic techniques such as Microwave ,IR employed in molecular spectroscopy
		CO5: To calculate some physical properties of molecules by using rotational and vibrational spectrum
		CO6: Applications of Raman and Electronic Spectroscopy for chemical analysis.

Course Title	Course code	COs
Inorganic Chemistry-I	CHE102	CO1: Predicting geometries of various simple molecules Using VSEPR, VBT and MO theories
		CO2: Learning various aspects of inorganic chains, rings, Cages and 3d series of metal ions
		CO3: Splitting of d-orbitals in various geometries, and to predict the stability of complexes.
		CO4 : Determination of spectral properties of complex compounds and predict the colour, magnetic properties of the complex compounds.
		CO: 5 Interpret the electronic spectra of complex compounds and Explain Orgel and Tanabe-Sugano diagrams

Course Title	Course code	COs
Inorganic chemistry Practical-I	CHEP01	CO1: Analyze radicals present in a compound
		CO2: Handle of chemicals and apparatus
		CO3: Analyze the principles involved in the preparations of complex compounds
		CO4: Weigh and prepare the solutions
		CO5: Eliminate the interfering anions

Course Title	Course code	COs
Organic Chemistry-I	CHE103	CO 1: To determine the stereochemistry of different organic molecules and various possible conformations of Organic compounds
		CO2: Apply Huckel's and Craig's rule to differentiate between aromatic and non aromatic compounds
		CO3: The construction of various heterocyclic rings using different organic transformations
		CO4: Different natural products with biological activity and their synthesis
		CO5: Describe the optical isomerism exhibited by the molecules, which are not having asymmetric carbons

Course Title	Course code	COs
Organic chemistry Practical-I	CHEP02	CO1: Acquire hands on experience on for the handling of Equipment, Glassware, Chemicals and safety measurements
		CO2: Develop the skills like preparation of solutions, crystallization techniques, checking the purity of Compounds and collection of pure samples
		CO3: Correlate theoretical knowledge in the various steps of compound preparation
		CO 4: Adopt the Techniques like Acetylation, Benzoylation, Nitration, Methylation, Condensation, Bromination, Deamination in the Preparation of Organic compounds
		CO 5: Adopt the principles like Beckman's Rearrangement and Hoffmann's Rearrangement for Preparation of Organic Compounds

CourseTitle	Course code	COs
Physical Chemistry-I	CHE104	CO1: Understanding thermodynamic functions, deriving Various relations and their applications
		CO2: Study of chemistry of surface active agents- Polymers and polymerization and determination of average molecular weight of polymers
		CO3: Deriving different theories of rates of reactions, study of different effects on rates of reactions, Predicting rates of complex and fast reactions. Predicting the catalytic mechanisms and rates of Chain reactions
		CO4: Understanding photo physical and photochemical processes and their applications

CourseTitle	Course code	COs
Physical chemistry Practical-I	CHEP03	CO1: Estimation of HCl and CH ₃ COOH with standard NaOH by using conductivity meter
		CO2: To determine cell constant and dissociation Constant of weak acid
		CO3: Determination of CST of phenol-water system and study of the effect of impurity on miscibility Temperature
		CO4: Determination of partial molar volume
		CO5: Develop skill in procedure, principle and instrumental methods applied in analyzing practical tasks by using conductivity meter

SEMESTER II

CourseTitle	Course code	COs
General Chemistry-II	CHE201	CO1: Solving Schrödinger wave equation of H-atom and application of perturbation and variation method for He – atom and SHO to determine ground state energy
		CO2: Identification of symmetry elements in molecules and finding out point group
		CO3: Classification of errors and minimization of errors Application of statistical methods to study random errors
		CO4: Obtaining fundamental knowledge on computers and their applications to solve chemical problems
		CO5: Study of FORTRAN-77 programming language and apply its applications in chemistry

CourseTitle	Course code	COs
Inorganic Chemistry-II	CHE202	CO1:The basic concepts of structure and bonding of Metalclusters
		CO2:Acquire knowledge on ligands and fluxional molecules, different organic ligands and metalcomplexes
		CO3:Methods to determine stability of metal complexes And bio-inorganic chemistry
		CO4:Different types of reaction mechanisms of metal Complexes and electron transfer reactions

CourseTitle	Course code	COs
Inorganic Chemistry Practical-II	CHEP201	CO1: Determination of some metal ions by using classical methods of analysis like volumetric and gravimetric methods
		CO2:Estimation of quantity of some metal ions in the Presence of other metal ions
		CO3:Handle the chemicals and apparatus
		CO4:Prepare and standardize the solutions, and Indicators and buffer solutions
		CO5:Analyze the concepts of solubility rules

CourseTitle	Course code	COs
Organic Chemistry-II	CHE203	CO1: Analysis of the various features of aliphatic and aromatic nucleophilic substitution and elimination Reactions
		CO2: Study of Addition to Carbon–Carbon Multiple Bonds and Addition to Carbon-Hetero Multiple Bonds
		CO3: Understanding and applying Molecular Rearrangements
		CO4: Identification of organic molecule by using UV, IR, NMR and Mass data
		CO5: Study of protecting groups

CourseTitle	Coursecode	COs
Organic Chemistry Practical -II	CHEP202	CO1: Separation of two compounds into individual compounds by adopting solubility method
		CO2: Identification and conformation of functional group(s) present in each of compound
		CO3: Preparation of one solid derivative for the conformation of each of the functional group(s)
		CO4: Separation of two compounds into individual compounds by adopting solubility method

Course Title	Course code	COs
Physical Chemistry-II	CHE204	CO1:Acquire knowledge on theories and principles of NMR,ESR spectroscopy and studying the NMR spectra of different compounds
		CO2: Ability to understand the entropy changes at transition point, understanding third law of thermodynamics and study of thermodynamics of Microstates
		CO3:Construction of cells applications, deriving some Theories of conductance of electrolytes
		CO4:Study of advanced electrochemistry, electrode Kinetics and applying electro analytical techniques for the analysis

Course Title	Course code	COs
Physical Chemistry Practical -II	CHEP203	CO1: Students determined rate constant of the oxidation of iodide ion with per sulphate ion and studied the equilibrium constant of $KI_3 \rightleftharpoons KI + I_2$ by partition coefficient method and determination of unknown concentration of potassium iodide
		CO2:They learned about determination of Coordination Number of cuprammonium cation
		CO3:They carried potentiometric titration to determine concentration of Fe(II) and P^H metric titration to determine the concentrations of $NaHCO_3$ and Na_2CO_3 respectively
		CO4:They carried out conductometric titration of mixture of HCl, CH_3COOH against standard NaOH and studied Beer-Lambert's law by Iron-thiocyanate system colorimetrically

SEMESTER III

Course Title	Course code	COs
Organic Reaction Mechanism and Pericyclic Reactions	CHE301	CO1: Understand the differences between aliphatic nucleophilic and electrophilic reactions with suitable examples
		CO2: Develop an idea on asymmetric synthesis and its principle and apply some techniques for the determination of enantiomeric excess
		CO3: Explain the reaction conditions for the organic reactions based on the orbital correlation diagrams
		CO4: Ability to identify the reaction conditions of sigma tropic reactions in number of organic synthesis

CourseTitle	Course code	COs
OrganicSpectroscopy-I	CHE302	CO1: Explain the basic principles of UV- Visible spectroscopy, working principle and outline of UV spectroscopy
		CO2:Able to interpret the IR Spectroscopy and theirbasic principles
		CO3:Explain the basic principle and able to interpret the outline of NMR spectroscopy
		CO4:Ability to identify the mass fragments of organic molecules

CourseTitle	Course code	COs
Estimationsand chromatography lab	CHEP302	CO1:AbilitytoEstimate the organic compounds by volumetric titrations
		CO2:Explain and separate the mixture of organiccompounds by using Column chromatography
		CO3:Become skillful to do estimations and separationsof the different organic compounds

CourseTitle	Course code	COs
Modern Organic Synthesis-I	CHE303	CO1: Able to perform and operate various Organic reactions that lead to the formation of C-C single bonds
		CO2: Able to perform and operate various organic reactions that lead to the formation of C-C double bonds.
		CO3: Able to perform and operate various unactivated C-H bond reactions, Hydro boration and Organo boranes. Apply them in modern organic synthesis.
		CO4:Able to utilize various reagents to protect and deprotect the functional groups, Elucidate the mechanism of Phase transfer catalysts in modern Organic reactions.

CourseTitle	Coursecode	COs
Multi step Synthesis of organic Compounds lab	CHEP301	CO1:Ability to prepare organic drugs in the laboratories
		CO2:Explain and identify the various stages of drug preparation
		CO3:Become skillful to isolate different functional group substituted organic compounds

CourseTitle	Course code	COs
Chemistry Of Natural Products	CHE304	CO1:Ability to do isolation and identification, synthesis of some of important alkaloids
		CO2:Explain and identify the methods to isolate and synthesize some of terpenoids
		CO3:Become skillful to isolate and synthesize the naturally occurring drugs like Steroids
		CO4: Ability to identify the differences Between flavonoids and isoflavonoids and isolation of these compounds

SEMESTER IV

Course Title	Course code	COs
Organic Reaction Mechanism –II and Organic Photo Chemistry	CHE401	CO1: Ability to explain the evidence for existence of freeradicals, generation, stability and reactivity of freeradicals
		CO2: Explain the applications of asymmetric synthesis like chiral substrate controlled and chiral reagentcontrolled asymmetric synthesis
		CO3: Explain theory and practice of common photochemical and physical methods and able to execute these experimentally
		CO4: Ability to explain the basic concepts offundamentals of photochemistry

CourseTitle	Course code	COs
OrganicSpectros copy-II	CHE402	CO1: Able to explain the concepts of Optical Rotatory Dispersion and CD spectroscopy
		CO2: Become skillful to explain the advanced techniques of NMR spectroscopy
		CO3: Able to Analyze the structures of the organic compounds by using spectral data
		CO4: Ability to do experimental work on separation techniques and chromatographic techniques

CourseTitle	Course code	COs
Chromatographic Separation and Isolation & identification of Natural Products	CHEP402	CO1: Ability to isolate organic drugs in the laboratories
		CO2: Explain and identify the various stages of drug isolation
		CO3: Become skillful to separate the organic compounds by using Thin Layer Chromatography

CourseTitle	Course code	COs
Modern Organic Synthesis- II	43303	CO1: Able to learn about the properties and handling conditions of various organo silane reagents and able to perform the synthetically viable reactions with organo silanes.
		CO2: Able to learn the properties and handling conditions of various oxidizing agents and can be able to perform reactions with oxidizing agents which are synthetically very viable.
		CO3: Able to learn the properties and handling conditions of various reducing agents and can be able to perform reactions with oxidizing agents which are having great synthetic utility.
		CO4: Able to learn the concepts of retero synthesis to perform the disconnections /FGI /FGA for a molecule (Reterosynthetic analysis) that lead to design the probable synthetic path for the selected organic molecule.

CourseTitle	Course code	COs
Spectral Identification of Organic Compounds	CHEP401	CO1: Ability to design the structure of the organic compounds in the laboratories using spectral data
		CO2: Explain the concepts to detect the structure of the compounds using spectral data
		CO3: Become skillful to analyzing the spectral data and sample analysis

CourseTitle	Course code	COs
Bio Organic Chemistry	43304	CO1:Able to explain the importance of enzymes and biopolymers and their synthesis
		CO2:Explain the applications of some important Antimalarial and antibiotics and able to synthesize these compounds in the laboratories
		CO3:Able to understand the occurrence, isolation and synthesis of some important vitamins
		CO4:Ability to explain the differences between DNA and RNA, and become skillful of advanced techniques of DNA technology