V. S. M. COLLEGE (A): RAMACHANDRAPURAM

COURSE OUTCOMES

M.Sc. ORGANIC CHEMISTRY

GENERAL CHEMISTRY-I

CO1: Get access to have the broad overview on how the science of quantum mechanics can be applied to find the qualitative and quantitative interpretation of various scientific chemical outcomes. This would enable them to take up research in theoretical chemistry for those who are interested in the area of mathematics.

CO2: Acquire sound knowledge on basic theoretical principles about the science of spectroscopy which is important for analysis of samples besides knowing molecular parameters of any matter by using various spectrophotometers such as IR, UV-Visible which have their own industrial applications.

INORGANIC CHEMISTRY-I

CO1: After learning this course the student can able to know different theories in chemical bonding structures, metal clusters, bonding in coordination compounds and electronic spectra of transition compounds.

CO2: After learning this course the student can able to apply the knowledge to construct MOT diagrams for coordination compounds, to give structure to metal cluster compounds, to know distortion in coordination complexes and to predict electric and magnetic properties of complexes.

CO3: After learning this course the student can able to analyse colour spectra of transition compounds

CO4: After learning this course the student can able to draw MOT for more complex compounds and colour spectra of some transition metal complexes.

ORGANIC CHEMISTRY-I

CO1: Understand the differences between reaction intermediates

CO2: Apply the stereo chemical principle to asymmetric synthesis

CO3: Compare the preparations and properties of heterocyclic compounds

CO4: Assemble the structure of natural products

PHYSICAL CHEMISTRY-I

CO1: Get basic knowledge of theoretical and experimental principles required to explain synthesis, mechanism and yield of chemical transformations in various physical states such as gases, solutions etc. which help the students in planning research after post graduation as well as enhance their job securing skills.

CO2: Able to know the basic knowledge on light sensitized reactions and its applications which help to explain qualitative and quantitative ideas of certain facts such as study of synthesis of proteins, mechanisms of solar cells etc. besides their applications in the analytical chemistry such as fluorimetry, phosphorometry through the ideas of quantum yield.

INORGANIC CHEMISTRY -I LAB

CO1: The student can able to understand the difference between qualitative and quantitative analysis. They are able to know how to handle the glass ware. What precautions are to be taken at the time of lab experiment and with chemicals.

CO2: The student can able to apply to Identify the cations and anions in a mixture or salt and ability to prepare inorganic complexes.

CO3: The student can able to analyse both Qualitatively and quantitatively.

CO4: The student can able to plan and prepare regents to do new Analysis.

ORGANIC CHEMISTRY-I LAB

CO1: Recognize the different methods for synthesis of organic compounds

CO2: Apply this knowledge to prepare new drugs used for the society to diagnose, cure and prevent diseases

CO3: Analyze the report and get ideas to improve yield and obtaining pure compound

CO4: Design new routes to preparation of new drugs

PHYSICAL CHEMISTRY-I LAB

CO1: Become familiar to basic thermodynamic and kinetic methods as a part of physical chemistry study.

CO2: Enable to know the thermodynamic study of complex matter in terms of phase rule which finds lot of industrial applications.

CO3: Can analyse the speed of reactions/order of reactions etc which helps them in basic research.

GENERAL CHEMISTRY-II

CO1: Obtain brief overview on how to apply certain quantum mechanical techniques to explain various physical properties of matter such as bond energies, bond length, etc. in both ground and excited states with the idea of basic theories such as MO, VB theory and Hybridization.

CO2: Get familiarity in symmetry ideas of molecules and various mathematical techniques such as matrix models of vectors during symmetry operations can be represented as character tables by using which their spectral properties can be predicted.

CO3: Gain knowledge on how to process experimental data before it can be finalised to find the error of analysis by applying models of statistical mathematics through significant figures.

INORGANIC CHEMISTRY-II

CO1: After learning this course the student can able to explain metal-metal bonding, organometallic compounds and mechanism of coordination compounds.

CO2: After learning this course the student can able to generalize the M-M bond existence, ferrocene properties, stability of coordination compounds and electron transfer reactions.

CO3: After learning this course the student can able to predict stability of coordination compounds, mechanism involved in redox system of coordination compounds.

CO4: After learning this course the student can able to develop a new idea on stability of complexes like metallocenes and they go insight into the inner and outer sphere mechanism of coordination compounds.

ORGANIC CHEMISTRY-II

CO1: Understand the different types of organic reactions

CO2: Demonstrate the addition, elimination and substitution reactions

CO3: Solve the substitution and elimination problems

CO4: Assemble the spectral knowledge to determine the structure of compounds

PHYSICAL CHEMISTRY-II

CO1: Acquire knowledge on the techniques of NMR and ESR which play an important role in the identification of chemical products and molecular parameters which helps them in research as well as in getting employment.

CO2: Able to know the properties of bulk matter such as entropy, free energy etc., which predict the direction of spontaneous chemical transformations, yield etc., through the science of statistical thermodynamics based on probability approach i.e. by using ideas of partition functions.

CO3: Get knowledge on electrochemical aspects on various chemical substances (electrolytes, electrodes) and their applications which plays important role in the synthesis of organic products and analysis of samples by various electrochemical techniques such as potentiometry, voltametry, etc., which have their importance in chemical analysis as well as an advancement in chemistry through research after the completion of their post graduation.

INORGANIC CHEMISTRY-II LAB

CO1: The student can able to understand the difference between qualitative and quantitative analysis. They are able to know how to handle the glass ware. What precautions are to be taken at the time of lab experiment and with chemicals.

CO2: The student can able to apply the volumetric methods to estimate the ions present in the sample by using different techniques, know the preparation and purification of different inorganic compounds.

CO3: The student can able to Analyse the samples a quantitatively.

CO4: The student can able to generalize the errors during the experiment and try to reduce it.

ORGANIC CHEMISTRY-II LAB

CO1: Identify the method to separate an organic mixture

CO2: Use this knowledge to testing the samples

CO3: Analyses the properties of sample

CO4: Creating healthy society through identifying the different compounds and their separation present in the body fluids and other samples

PHYSICAL CHEMISTRY-II LAB

CO1: Get hands-on experience with various instruments like potentiometer, pH meter, conductivity meter, colorimeter for the estimation of samples.

CO2: Helps this quantitative analysis to meet some of the industrial applications

CO3: This knowledge helps to create new methods of analysis.

ORGANIC REACTION MECHANISMS-I AND PERICYCLIC REACTIONS

CO1: Getting information about how some reactions are faster with retention of configuration at the reaction site in the formed product.

CO2: Importance of asymmetric synthesis in stereochemistry, particularly Topocity in chiral molecules

CO3: Synthetic designing of pharmaceutical molecule.

CO4: Know about reversible and single step reactions called Pericyclic reactions.

ORGANIC SPECTROSCOPY-I

CO1: Basic concepts of UV-Visible spectrophotometry and structural aspects of chromophore and auxochrome

CO2: Quantitative identification of various functional groups in organic molecules.

CO3: H1NMR and C13NMR provides qualitative and quantitative structure determination of organic molecules.

CO4: Determination of molecular weight and formulae of organic molecules.

ORGANIC SYNTHESIS-I

CO1: C-C single bond forming routes are known via enolates and carbenes.

CO2: C=C bond generation routes will be known.

CO3: Synthetic applications of hydroboration reaction when thexyl borane and 9-BBN are used.

CO4: Knowledge about protecting groups in synthesizing desired products and phase transfer catalysts.

CHEMISTRY OF NATURAL PRODUCTS

CO1: Understand the biological importance of natural products

CO2: Apply this knowledge to daily life for for medicinal use

CO3: Analyse the synthesis and biosynthesis of natural products

CO4: Synthesis of new drugs

MULTISTEP SYNTHESIS OF ORGANIC COMPOUNDS LAB

CO: Knowledge about how starting molecules are converting into desired products.

ESTIMATIONS AND CHROMATOGRAPHY LAB

CO1: Get proper idea about how functional groups are helped in determinations.

CO2: Knowledge about separation and purification of organic compounds.

ORGANIC REACTION MECHANISMS-II AND ORGANIC PHOTOCHEMISTRY

CO1: Can understand the radical reactions and molecular rearrangements which are important to predict mechanism path and products.

CO2: Can acquire knowledge about the methodologies in asymmetric synthesis for designing pharmaceutical active molecules.

CO3: Can apply this knowledge in pharma industry.

CO4: Get information about how compounds absorb light energy and undergo transformations.

ORGANIC SPECTROSCOPY-II

CO1: Get knowledge about conformation and configuration of chiral cyclohexanone derivatives.

CO2: Can analyse the NMR spectra.

CO3: Can apply in structural elucidation of organic molecules.

CO4: Can able to separate and purify the compounds.

ORGANIC SYNTHESIS-II

CO1: Get knowledge about the importance of organo silanes in synthetic organic chemistry.

CO2: Can able to know some oxidizing reagents.

CO3: Can attain the information of the synthetic applications of reducing agents.

CO4: Can apply the retro synthetic analysis in synthesis of new molecules.

BIO-ORGANIC CHEMISTRY

CO1: Understand the different types of polymers present in the body fluids
CO2: Describe the activities of antibiotics and anti malarials.
CO3: Analyse the structure and activity of vitamins.
CO4: Discuss the importance of nucleic acids in living organisms.

CHROMATOGRAPHIC SEPARATION, ISOLATION AND IDENTIFICATION OF NATURAL PRODUCTS LAB

CO: Get knowledge about the separation and purification of natural products and synthesized organic compounds.

SPECTRAL IDENTIFICATION OF ORGANIC COMPOUNDS (UV, IR, H1-NMR, C13 NMR AND MASS) LAB

CO: Can acquire knowledge about the isolation of various organic compounds from naturally occurung samples.

COMPREHENSIVE VIVA-VOCE

CO: Get knowledge about the topics which were studied in the two years of PG Course.