

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

COURSE OUTCOMES

M.Sc. ANALYTICAL 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 reagents to do new Analysis.

ORGANIC CHEMISTRY-I LAB

- CO1:** Recognise 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 compound

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.

SEPARATION METHODS-I

- CO1:** By learning this course, the student can able to explain the basics of chromatography, chromatographic techniques and parameters involved in it. Discuss which method is to be applicable to separate the components in the samples depending upon their physical nature.
- CO2:** By learning this course, the student can able to apply chromatographic techniques to separate the biological samples.
- CO3:** By learning this course the student can able to Analyse the components in the sample both qualitatively and quantitatively.
- CO4:** By learning this course the student can acquire knowledge to construct a new method to separate the components in the sample.

QUALITY CONTROL & TRADITIONAL METHODS OF ANALYSIS-I

- CO1:** The student can understand the basic concepts of quality control, quality assurance, decomposition techniques, oxidant-reductant systems used in chemical analysis.
- CO2:** The student can apply this knowledge in Pharmaceutical & various chemical Industries to analyse the samples.
- CO3:** It is used to analyse the experimental data after the quantitative analysis of the sample.
- CO4:** The student can able to create new methods for chemical analysis by understanding the concepts which are introduced in this course.

APPLIED ANALYSIS-I

- CO1:** Student can able to understand the different methods & experimental processes to analyse various chemical constituents which are present in different types of materials.
- CO2:** Able to apply the knowledge to analyse the samples of different materials quantitatively.
- CO3:** The student can able to analyse experimental data and express the ideas whether the particular material is suitable for intended purpose.
- CO4:** The student can able to create new analytical methods based on the concepts introduced in this course.

INSTRUMENTAL METHODS OF ANALYSIS-I

- CO1:** After learning this course the student can able to understand the principle and instrumentation of Spectroscopic techniques. Able to explain the difference between the different Spectroscopic techniques.
- CO2:** After learning this course the student can able to interpret the data of the samples with different Spectroscopic techniques which helps in characterization of the compounds.
- CO3:** After learning this course the student can able to Analyse the components both Qualitatively and quantitatively.
- CO4:** After learning this course the student can acquire the knowledge on the spectroscopic technique and try to minimize the errors occurred during the analysis.

CLASSICAL METHODS OF ANALYSIS-I LAB

- CO1:** The student can able to understand the difference between the qualitative and quantitative analysis.
- CO2:** The student can able to apply to quantify ions by volumetric, gravimetric analysis and chromatographic methods.
- CO3:** The student can able to estimate the ions present in the sample by using different techniques.
- CO4:** The student can able to know the preparation of reagents and how to handle it carefully.

INSTRUMENTAL METHODS OF ANALYSIS-I LAB

- CO1:** The student can able to understand the difference between classical methods and instrumental methods of Analysis.
Understand the difference between qualitative and quantitative analysis.
- CO2:** The student can able to measure the EMF, colour intensity, pH of samples by using instruments like potentiometer, colorimeter, pH meter and Flame Photometry.
- CO3:** The student can able to analyse the sample both qualitatively and quantitatively.
- CO4:** The student can able to plan ,to do with number of samples.

SEPARATION METHODS-II

- CO1:** After learning this course the student can able to explain the principle and instrumentation of Paper, Thin and Ion-exchange chromatography.
- CO2:** After learning this course the student can able to predict the method to separate the biological samples and to separate cations and anions.
- CO3:** After learning this course the student can able to analyse the components both Qualitatively and quantitatively.
- CO4:** After learning this course the student can able to collect some samples and do analysis.

TRADITIONAL METHODS OF ANALYSIS-II

- CO1:** Student can be able to understand the concepts of Precipitation which is used for gravimetric & electrogravimetric methods, oxidant-reductant systems & quantitative determination methods for some drugs.
- CO2:** Able to apply the knowledge to analyse different Inorganic & Organic constituents which are present in different materials particularly in medicine.
- CO3:** Student can able to analyse whether the particular reagent is used for precipitation of the analyte of interest.
- CO4:** Student can be able to create new methods based on the concepts introduced in this course.

APPLIED ANALYSIS-II

- CO1:** Student can be able to understand the different methods and experimental processes to analyse various chemical constituents which are present in different types of materials.
- CO2:** Student can able to apply the knowledge to analyse the samples of different materials quantitatively.
- CO3:** The student can be able to analyse the experimental data and express the ideas whether the particular material is suitable for intended purpose.

CO4: Able to create new analytical methods which are used for qualitative and quantitative analysis of a sample, based on the concepts introduced in this Course.

INSTRUMENTAL METHODS OF ANALYSIS-II

CO1: After learning this course the student can able to Explain the principle and instrumentation of different techniques like Elemental Spectroscopy, Thermal methods, Electro-Analytical methods, Radio chemical methods of Analysis.

CO2: After learning this course the student can able to know which method will be employed for the Analysis of different parameters of the compounds like mass, temperature, enthalpy, EMF, etc.

CO3: After learning this course the student can able to Analyse the components both Qualitatively and quantitatively.

CO4: After learning this course the student can able to plan to get more samples and do analysis.

CLASSICAL METHODS OF ANALYSIS-II LAB

CO1: The student can able to understand the difference between the qualitative and quantitative analysis.

CO2: The student can able to apply quantify ions by volumetric, gravimetric analysis and chromatographic methods.

CO3: The student can able to estimate the ions present in the sample by using different techniques.

CO4: The student can able to know the preparation of reagents and how to handle it carefully.

INSTRUMENTAL METHODS OF ANALYSIS-II LAB

CO1: The student can able to understand the difference between classical methods and instrumental methods of Analysis.
Understand the difference between qualitative and quantitative analysis.

CO2: The student can able to measure the EMF, Colour intensity, pH of samples by using instruments like potentiometer, colorimeter, pH meter and Flame Photometry.

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

CO4: The student can able to plan to do with number of samples.

COMPREHENSIVE VIVA-VOCE

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