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

B.SC MPC-COURSE OUTCOMES

B.SC MATHEMATICS

DIFFERENTIATION EQUATIONS

CO1: Able to solve first order differential equations

CO2: Able to perform step-by-step analysis to solve the differential equations using an appropriate method.

CO3: Create and analyze mathematical models using higher order differential equations to solve application problems such as harmonic oscillator and circuits.

CO4: Evaluate first order differential equations including separable, homogeneous, exact, and linear.

SOLID GEOMETRY

CO1: To understand the concepts & advance topics related to two & three dimensional geometry.

CO2: Geometry briefly is used in various daily life applications such as surveying, astronomy, navigation and building and much more.

CO3: Compare the 2D and 3D objects and able to find angles , areas, plane equations ,etc

CO4: Find family of spheres Passing through a circle , tangent planes and normal lines to a sphere.

ABSTRACT ALGEBRA

CO1: Present the relationships between abstract algebraic structures with familiar numbers systems such as the integers and real numbers.

CO2: Generate groups given specific conditions and knowledge of use various canonical types of groups

CO3: Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups

CO4: Develop the ability to form and evaluate conjectures

REAL ANALYSIS

CO1: Use the definitions of convergence as they apply to sequences, series, and functions

CO2: Demonstrate an understanding of limits and how they are used in sequences, series, differentiation and integration.

CO3: Determine the continuity, differentiability, and integrability of functions defined on subsets of the real line

CO4: Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and inerrability

ANALYTICAL SKILLS (FOUNDATION COURSE)

CO1: Making real-time decisions by rapidly assessing the facts and assumptions
CO2: Identifying logical errors, false conclusions and unsubstantiated assertion
CO3: Eliciting information from other using tactful and insightful questioning techniques
CO4: Detecting and taking definitive action to prevent potential problems

RING THEORY & VECTOR CALCULUS

CO1: Integrate functions of several variables over curves and surfaces
CO2: Present concepts and properties of various algebraic structures.
CO3: Discuss the importance of algebraic properties relative to working within various number systems
CO4: Calculate and interpret derivatives in up to three dimensions.

LINEAR ALGEBRA

CO1: Identify and construct linear transformations of a matrix.
CO2: Compute and use Eigen vectors and Eigen values
CO3: Determine the rank, determinant, Eigen values and eigenvectors, diagonalization, and different factorizations of a matrix
CO4: Characterize linear transformations as onto, one-to-one

LAPLACE TRANSFORMS

CO1: An understanding of Fourier series and Laplace Transform to solve real world problems.
CO2: Laplace transform is used for the analysis of linear time-invariant systems
CO3: Analyze and solve engineering problems using Laplace Series
CO4: Approach more advanced aspects of transform methods

NUMERICAL ANALYSIS

CO1: Understand the theoretical and practical aspects of the use of numerical analysis.
CO2: The course will also develop an understanding of the elements of error analysis for numerical methods and certain proofs.
CO3: Establish the limitations, advantages, and disadvantages of numerical analysis
CO4: Analyse and evaluate the accuracy of common numerical methods

NUMBER THEORY

CO-1: Understand the logic and methods behind the major proofs in Number Theory
CO-2: Construct mathematical proofs of statements and find counterexamples to false statements in Number Theory.
CO-3: Determine multiplicative inverses, modulo n and use to solve linear congruence
CO-4: Appropriately integrate technology into mathematical processes

GRAPH THEORY

CO-1: Explain graph theory in a coherent and technically accurate manner
CO-2: Demonstrate knowledge of the syllabus material
CO-3: Reason from definitions to construct mathematical proofs
CO-4: Define and relate basic notions in graph theory

INTEGRAL TRANSFORMS

CO-1: Able to know the use of Laplace transform in system modeling, digital Signal processing, process control, solving Boundary Value Problems

CO-2: Apply Fourier and Laplace transform in solving ODEs and PDEs

CO-3: To analyze properties of special functions by their integral representations and Symmetries.

CO-4: Students will gain a range of techniques employing the Laplace and Fourier Transforms in the solution of ordinary and partial differential equations.

SPECIAL FUNCTIONS

CO-1: Understand purpose and functions of the gamma and beta functions, Fourier series and Transformation

CO-2: Determine types of PDEs which may be solved by application of special functions.

CO-3: Analyze properties of special functions by their integral representations & symmetries.

CO-4: Evaluate different types of integral calculus problems and Fourier series to solve differential equations

ADVANCED NUMERICAL ANALYSIS

CO-1: Understand the theoretical and practical aspects of the use of numerical analysis

CO-2: Apply appropriate theories, principles and concepts relevant to Numerical Analysis

CO-3: Identify the suitable computational technique for a specific type of problems

CO-4: evaluate the literature within the field of Numerical Analysis, analyze and interpret information from a variety of sources relevant to Numerical Analysis

PRINCIPLES OF MECHANICS

CO-1: Develop an understanding of the principles of dynamics

CO-2: Apply Kepler's laws to solve the problems

CO-3: Analyze problems in a systematic and logical manner, including the ability to draw free-body diagrams of rigid body.

CO-4: An ability to calculate centroids and moments of inertia.

FLUID MECHANICS

CO-1: Understand stress-strain relationship in fluids, classify their behaviour .

CO-2: Apply Bernoulli principle and compute pressure drop in flow systems of different configurations

CO-3: Analyze the performance aspects of fluid machinery specifically for centrifugal pump and reciprocating pump

CO-4: Evaluate the pressure distribution for incompressible fluids

APPLIED GRAPH THEORY

CO-1: Explain about graph theory in a coherent and technically accurate manner.

CO-2: Demonstrate knowledge of the graph theory

CO-3: Validate and critically assess a mathematical proof

CO-4: Reason from definitions to construct mathematical proofs;

B.SC PHYSICS

➢ MECHANICS ,WAVES& OSCILLATIONS :

CO1: To understand basic theories related with properties of matter and its applications todetermine values of various physical quantities associated with matter.
CO2: Be able to apply knowledge of the properties of matter to explain naturalphysical processes and related technological advances.
CO3: Be able to solve relevant theoretical problems and use their conceptual understanding of the basic theories of properties of matter.
CO4: To derive equations of various theorems and find the result of various experiments related with properties of matter.

➢ MECHANICS ,WAVES& OSCILLATIONS LAB :

CO1: To develop basic skills to perform experiments to understand the conceptfrom existing theories of properties of matter.
CO2: To perform experiments and interpret the result of observations.
CO3: To design experiments and acquire data inorder to explore physical principles, effectively communicate results and critically evaluate related scientific studies.
CO4: To provide an intellectually stimulating environment to develop skills and interest of students to the best of their practical.

WAVE OPTICS

CO1: Understand the nature of light and principles of Laser and holography.
CO2: Analyze the intensity variation of light due to interference, diffraction and polarization.
CO3: Solve problems in Optics by selecting the appropriate equations and performing numerical or analytical calculations.
CO4: Student can able to operation of optical devices including polarizers, interferometers,and Lasers

WAVE OPTICS LAB

CO1: Understand the phenomena of dispersion of light, interference, diffraction and polarization by conducting experiments in dark room.

CO2: Analyse,interpret and communicate results from Laboratory experiments, orally or in a written laboratory report.

CO3: Student can able to calculate the wavelength of given source of light and determination of refractive indices of different materials by using the above phenomena.

CO4: After completion of this lab student can attain knowledge about interference , diffraction patterns and operation of different Lasers.

THERMODYNAMICS AND RADIATION PHYSICS

CO1: To Read, Understand and interpret physical information –verbal, mathematical and graphical concepts of Thermodynamics.

CO2: To Impact skills required to gather information from resources and use them.

CO3: Ability to employ critical thinking and efficient problem solving skills in all the basic areas

CO4: Students would have developed skills and enthusiasms to the best of their potential.

THERMODYNAMICS AND RADIATION PHYSICS LAB

CO1: Students will be able to Perform experiments and interpret the results of observation, including making an assessment of experimental uncertainties.

CO2: They develop the ability to apply the knowledge acquired in the classroom and laboratories to specific problems in theoretical and experimental Physics.

CO3: To apply the theories learnt and the skills acquired to solve real time problems

CO4: To understand the concepts and significance of the various physical phenomena

ELECTRICITY, MAGNETISM & ELECTRONICS

CO1: To learn about Gauss law and solve the electric field and magnetic field for various geometric objects and to learn basic electronic concepts in analog and digital theory.

CO2: To be Explain all the topics of Experiments, Concepts and Derivations to the student

CO3: Apply the principles of electronics in day to day life.

CO4: Encourage all the students to study higher educational courses in reputed institutes and to enrich the students with creative, logical and analytical skills and to motivate the students towards research side.

ELECTRICITY, MAGNETISM & ELECTRONICS LAB

CO1: To provide a comprehensive understanding of electronic devices and circuits.

CO2: Know the characteristics of diodes, transistors, and logic gates.

CO3: Design simple circuits and mini projects.

CO4: To understand the working of diode and transistor.

MODERN PHYSICS

CO1: To Create awareness on the topics of Atomic & Molecular Physics, Quantum mechanics, Nuclear Physics, and Solid state physics.

CO2: To be Explain all the topics of Experiments, Concepts and Derivations to the student.

CO3: Explain the basic principles of quantum mechanics and apply to Atomic, Molecular structure of energy levels etc..

CO4: Motivate all the students to pursue PG courses in reputed institutes and to endow the students with creative and analytical skills; this will equip them to become entrepreneurs.

MODERN PHYSICS LAB

CO1: To understand the connections of logic gates (AND, OR and NOT) using diodes and transistors. And verification of De Morgan's Theorems . Experimental verification of universal gates.

CO2: Student able to observe the practical to verify the truth tables behind how the logic operation was done.

CO3: Student can used to apply in different electronic circuits.

CO4: To motivate the students to pursue PG courses in reputed institutes and after graduation who excel in the competencies and values required for leadership to serve rapidly to global community.

ANALOG AND DIGITALELECTRONICS

CO1: To experience and understand basic physical fundamentals of Analog and Digital electronics and the key vocabulary to describe them:

CO2: To Apply conceptual understanding of the Electronics to general real-world situations.

CO3: To Gain a knowledge and understanding of fundamental physical concepts like amplifiers , linear integrated circuits, semiconductor devices.

CO4: Students can Apply an understanding of these concepts to various systems and devises. Like FET, MOSFET, DIGITAL IC'S.

ANALOG AND DIGITALELECTRONICS LAB

CO1: To Participate in the methodology by performing lboratory exercises..

CO2: Students can acquire The necessary electronic skills to produce a measurable signal from various sources

CO3: Students will gain the ability to operate basic instruments in Electronics and to prepare laboratory reports describing the result of experiments

CO4: Students will Develop a basis for future learning and work experience

INTRODUCTION TO MICROPROCESSORS AND MICROCONTROLLERS

CO1: To Read, understand and interpret physical information abour micro processors and micro controllers.

CO2: The students should have developed their understanding of core Physics by covering a range of topics.

CO3: The students should have attained a common level in embedded systems.

CO4: To Read, understand and interpret physical information abour micro processors and micro controllers.

INTRODUCTION TO MICROPROCESSORS AND MICROCONTROLLERS LAB

CO1: Students can Perform experiments and interpret the results of observation.

CO2: Students can Participate in the methodology by performing laboratory exercises

CO3: They can Apply an understanding of these concepts to various systems and devices, they can apply number conversions like binary to digital , decimal concersions

CO4: To Understand the relationship between observation and theory and their use in building the basic concepts of programming languages.

COMPUTATIONAL METHODS AND PROGRAMMING

CO1: To Experience and deeply understand selected fundamental principles and the key vocabulary to describe it.

CO2: To Understand the basic structure of the C – rogramming, declaration andUsageof Variables, Constants andOperators.

CO3: They can Employ conceptual understanding to make predictions, and then approach the problem mathematically.

CO4: To Solve equations containing exponential, logarithmic, quadratic, linear and non-linear equations

COMPUTATIONAL METHODS AND PROGRAMMING LAB

CO1: Students can Understand the relationship between observation and theory and their use in building the basic concepts of modern physics.

CO2: Students Understand how major concepts developed and changed over time.

CO3: They Explore important connections between theory, experiment, and current applications.

CO4: They will Develop a basis for future learning and work experience.

ELECTRONIC INSTRUMENTATION

CO1: To understand the basic measurements of Instruments (accuracy, precision, range,resolution, sensitivity and errors)

CO2: They can Apply the knowledge in calibrating the voltmeter, ammeter and measure the internal resistance by using Potentiometer.

CO3: Students can Test and troubleshoot electronic circuits (with respect to input impedance and sensitivity) in measuring voltage with multimeter and Electronic Voltmeter.

CO4: They can Measure the appropriate parameters (Voltage,Time Period, Frequency and Phase angle).

ELECTRONIC INSTRUMENTATION LAB

CO1: To Understand the theory, working principle, specifications and significance of Multimeter

CO2: They are able to measure the electrical parameters (Voltage-A.C & D.C, Current-A.C &D.C and Resistance.

CO3: To acquire knowledge and be able to make experiments on cathode ray oscilloscope

CO4: To learn the usage of electrical systems and be able to acquire a wide range of problem solving skills.

MATERIALS SCIENCE

CO1: To read and understand the use of materials to describe the basic structure of materials at molecular,macroscopic, microscopic scales

CO2: To analyse mathematical methods focuses on the methodologies, processes techniques and mathematical aids in the crystalline and physical properties of polycrystaline materials

CO3: Materials such as semiconductors,metals, composites,nano,carbonsmake our life easier.They are the sources of industrial growth and technological changes

CO4: Students should understand diffusion and electro chemical process in materials.and slove the problems.

MATERIALS SCIENCE LAB

CO1: Students will be able to learn the experimental procedures in properties of magneti. Materials and dielectrics.

CO2: Perform experiments on any materials to identify strength of given objects

CO3: Ability to operate basic instruments in materials science and to prepare laboratory reports describing the result of experiments

CO4: Students should adopt to interpret the data from experiments and by using these practicals they should try to do mini projects.

FUNDAMENTALS OF NANOSCIENCE

CO1: Will be able to acquire a knowledge about the importance of size dependent phenomenon.

CO2: Analyze the difference between top down and bottom up techniques for nanomaterial fabrication

CO3: Will be able to apply nano technology in bio- medical field, optical field and in microelectronic field

CO4: Will identify the different types of polymers and their applications in various fields.

FUNDAMENTALS OF NANOSCIENCE LAB

CO1: Students will be able to perform experiments on nano particles and interpret the results of observations

CO2: They should develop thier skills in the development of nanoparticles,gas sensors

CO3: Students have the ability to evaluate research and academic publications and to work independently with reasearch.

CO4: Students need to plan and carry out large scale projects logically and efficiently

SYNTHESIS AND CHARACTERIZATION OF NANOMATERIALS

CO1: To learn and understand the physical and chemical methods available for synthesis nanostructured materials

CO2: Students should analyse the mechanical properties of bulk nanostructured metals and alloys and carbon nanotubes.

CO3: Students would have to learn how to Apply the electronic microscopic and scanning probe microscopy to characterize the nano materials

CO4: Students sholud explore different kinds of polarization and it's effects on dielectric constants.

SYNTHESIS AND CHARACTERIZATION OF NANOMATERIALS LAB

CO1: Students should experience the different techniques for nano material coatings

CO2: Analyse the success and failure of free electron theroy the Origin of band gap and hall effect.

CO3: Ability to employ how to interpret the thermal dielectric piezoelectric behaviours of materials.

CO4: Students should have knowledge on various types of nano materials and asses the specimen preparation methods for various experiments.

APPLICATIONS OF NANOMATERIALS AND DEVICES

CO1: To study and understand the length of scales that defines nano for metals, semiconductor materials,microelectromechanical systems,electronic structure of nano crystals.

CO2: Students sholud have the ability to develop nano materials with a focus on fundamentals fabrication characterization and applications

CO3: To impact skills required from the subject of nano materials and use the in a correct way

CO4: Students should understand the concepts like mechanical properties of solids,surface modification of nano fibers with nano materials to the best of their knowledge.

APPLICATIONS OF NANOMATERIALS AND DEVICES LAB

CO1: Students have to know to design computing model of nanostructured devices and illustrate fabrication of nano electronic devices and sensors by doing experiments

CO2: They should develop their knowledge to apply medical implants for fast curation

CO3: Ability to demonstrate various tools used for design of MEMS and NEMS

CO4: Students have to take initiative step to classify micro electronics and micro systems and various substrate materials of micro electromechanical system and nano electromechanical system.

RENEWABLE ENERGY

CO1: Students acquire knowledge about the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems.

CO2: Students should known how to establish a context for sustainability and energy.

CO3: Students should apply their acquired knowledge in decreasing the pollution levels.

CO4: Students have to understand and to innovate new kinds of generating energy with renewable sources with no wastage.

RENEWABLE ENERGY LAB

CO1: Students will be able to understand the principal and production of energies experimentally and observe the results.

CO2: Student should analyze the working of solar cell, and solar cooker.

CO3: Students applied their theoretical and practical skills in to solve the real time problems.

CO4: They understand the outline division aspects and utilization of renewable energy sources for both domestics and industrial application

SOLAR THERMAL AND PHOTOVOLTAIC ASPECTS

CO1: Students should obtain the comprehension of solar radiation, characteristics of radiative materials, fabrication of solar cells.

CO2: Understood and acquired fundamental knowledge on the science and engineering of energy technologies and systems.

CO3: Students become capable of analysis and design of energy conversion systems.

CO4: To prepared the students for successful career in the energy industry, energy service companies, energy utility and consultancy agencies and in the academic and R&D institutions.

SOLAR THERMAL AND PHOTOVOLTAIC ASPECTS LAB

CO1: To gain knowledge about the solar flat plate collector, air dryer unit, Photo voltaic panel.

CO2: Students analyze the working of series and parallel combination of solar photovoltaic cells.

CO3: Students applied their theoretical learning's in solar power farms, roof top solar panels, satellites'.

CO4: Understood and acquired fundamental knowledge on the science and engineering of energy technologies and systems.

WIND, HYDRO AND OCEAN ENERGIES

CO1: Students got the awareness about the Wind generation, conversion, hydro power system, tidal energy.

CO2: The students are studying about sources of biomass and different biomass energy conversion systems. The students are able to solve simple problems related to gasifies.

CO3: Students has to apply their knowledge in mini and small hydro power systems.

CO4: The students are studying solar energy and wind energy related systems and Students are getting basic concepts about design of solar and wind energy systems and they are solving problems related to such technologies.

WIND, HYDRO AND OCEAN ENERGIES LAB

CO1: To learn about anemometer, wind generator.

CO2: Students made analysis on vertical and horizontal axes of wind turbine rotors, density of water on the output power of hydroelectric generator.

CO3: Applied their theoretical learning's in estimating the wind power , and evaluating the amplitude and frequency of wind energy.

CO4: Students understood the characteristics of wing energy.

ENERGY STORAGE DEVICES

CO1: Students got to know about electro chemical, magnetic, energy storage devices, fuel cells.

CO2: Students got to know about the lithium batteries, super conducting magnetic storage devices.

CO3: Students should apply their acquired knowledge in decreasing the size of device an increasing the memory.

CO4: Understand battery management systems and state-of-charge estimation.

ENERGY STORAGE DEVICES LAB

CO1: To learn about DC-AC inverter and DC-DC converters.

CO2: Students made analysis on charge and discharge characteristics of storage battery.

CO3: Applied their theoretical learning's in estimating the charging characteristics of a Ni-Cd battery using solar photovoltaic panel.

CO4: Students understood and learn about the hybridization of various energy conversion devices for vehicle electrification.

B.Sc. CHEMISTRY

INORGANIC AND PHYSICAL CHEMISTRY

CO1: Understand the basic concepts of p-block elements

CO2: Explain the difference between solid, liquid and gases in terms of intermolecular interactions.

CO3: Apply the concepts of gas equations, Ph and electrolytes while studying other chemistry courses.

ORGANIC AND GENERAL CHEMISTRY

CO1: Understand and explain the differential behaviour of organic compounds based on fundamental concepts learnt.

CO2: Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.

CO3: Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.

CO4: Correlate and describe the stereochemical properties of organic compounds and reactions.

ANALYSIS OF SALT MIXTURE LAB

CO1: Understand the basic concepts of qualitative analysis of inorganic mixture.

CO2: Use glassware, equipment and chemicals and follow experimental procedures in the laboratory.

CO3: Apply the concepts of common ion effect, solubility product and concepts related to qualitative analysis.

VOLUMETRIC ANALYSIS LAB

CO1: Use glassware, equipment and chemicals and follow experimental procedures in the laboratory

CO2: Understand and explain the volumetric analysis based on fundamental concepts learnt in ionic equilibria

CO3: Learn and identify the concepts of a standard solutions, primary and secondary standards

CO4: Facilitate the learner to make solutions of various molar concentrations : The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

INORGANIC AND ORGANIC CHEMISTRY-2

CO1: Obtain theoretical knowledge about metals and how they help in the preparation of various useful products.

CO2: Gain knowledge about geometrical aspects of compounds, and chemistry about the man made elements.

CO3: Get the knowledge of the bond nature of C-OH and C-X and how they are used in daily life and industries.

CO4: Acquire the knowledge about carbonyl compounds, carboxylic acids and how they become backbone of organic chemistry.

TITRIMETRIC ANALYSIS AND ORGANIC FUNCTIONAL GROUP REACTIONS LAB

CO1: Get hands-on expertise in determining the ions or radicals present in an unknown sample which will help in testing the samples of different kinds.

CO2: Capable in creating healthy society through identifying the levels of different ions present in body fluids and other samples.

CO3: Acquire the knowledge of reactions of some organic compounds by doing experiment.

SPECTROSCOPY AND PHYSICAL CHEMISTRY

CO1: Acquire the knowledge of analysis of materials by using UV and Visible light which helps in identification of impurities and conjugation in organic compounds and biological macro molecules.

CO2: Capable of identifying the functional groups present in organic molecules by using I.R. spectroscopy and molecular structure determination by using NMR spectroscopy which are useful in research.

CO3: Determine the molecular weight of an unknown non-volatile compound by using colligative properties which is most important in knowing about new compounds.

CO4: Acquire awareness on electrochemical aspects and their applications in various electrochemical techniques in determinations. Attain the knowledge on electrodes of and their applications in various electrochemical techniques in determinations, and the behaviour of various compounds in different phases at different conditions by using phase diagrams.

PHYSICAL CHEMISTRY AND IR SPECTRAL ANALYSIS LAB

CO1: Acquire hands-on expertize about the usage of conductivitymeter instead of classical methods.

CO2: Awareness on the interpretation of IR spectra which will be used in identifying the functional groups present in samples taken from different places.

INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY-1

CO1: Get knowledge of complex compounds and some organic compounds, their structures, properties which are very useful in biology and analysis of unknown materials. Acquire Knowledge on the properties of bulk matter such as entropy, free energy etc.

CO2: Can apply this knowledge in qualitative and quantitative analysis and in predicting the direction of spontaneous chemical transformations.

CO3: Can analyse the chemical and thermodynamic properties of new compounds

CO4: Can able to create new compounds depending on the requirement.

ORGANIC CHEMISTRY LAB

CO1: Get hands-on expertise in identifying the functional groups present in an unknown sample which will help in testing the samples of different kinds.

CO2: Capable in creating healthy society through identifying the different compounds present in body fluids and other samples.

INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY-2

CO1: Get knowledge on the reactivity of complex compounds. Acquire knowledge about the preparation of heterocyclic compounds and carbohydrates.

CO2: Can apply this knowledge in qualitative and quantitative analysis.

CO3: Can analyse the importance of natural products in biological systems.

CO4: Can able to create new conditions to speed up a reaction and to get high yields of desired compounds.

PHYSICAL CHEMISTRY LAB

CO1: Get hands-on expertise in determining the some of the properties of a fuel by using viscometer and stalagmometer.

CO2: Acquire knowledge about the rate of the reactions occur in human bodies which will be catalysed by enzymes.

ANALYTICAL METHODS IN CHEMISTRY

CO1: Get aware of the different types of quantitative analysis which are very crucial in research and pharma industries.

CO2: Obtain the knowledge of the processing of experimental data to find the error of analysis through significant figures.

CO3: Attain the information on separation of miscible components by different techniques which are very essential in research and pharma industries.

CO4: Acquire knowledge on how to know the number of compounds present in an unknown material which is very important in research and pharma industries.

ANALYTICAL METHODS IN CHEMISTRY LAB

CO: Acquire experimental knowledge about the determination of some ions which are useful for the life of living things.

ENVIRONMENTAL CHEMISTRY

CO1: Get knowledge about how many types of natural resources are available for us to and how they are being polluted.

CO2: Can apply this knowledge in various fields which cause pollution.

CO3: Can analyse the reasons for pollution caused in various directions.

CO4: Can able to create/develop methods to reduce the pollution.

WATER ANALYSIS LAB

CO: Get hands-on expertise in analyzing the water samples to know the parameters of water which will be helpful in identifying the water samples to be used for different purposes.

GREEN CHEMISTRY

CO1: Realize the adverse effects caused by some chemical compounds and reactions and how to prevent/minimize of those by proposing new routes to synthesize the important compounds which are useful for mankind.

CO2: Obtain the knowledge about some non toxic solvents used for chemical transformations.

CO3: Attain the importance of electromagnetic spectrum in performing some of the crucial reactions in eco-friendly ways.

CO4: Acquire the information of some catalysts which are not poisonous in the manufacturing of various industrial products.

GREEN CHEMISTRY LAB

CO: Obtain experimental knowledge of preparation of some important compounds in green methods by not producing harmful and hazardous chemicals into the environment for the safety of the society.

POLYMER CHEMISTRY

CO1: Gain knowledge of very important class of compounds, polymers and their types.

CO2: Obtain the knowledge about polymerization techniques and the molecular weight calculation.

CO3: Acquire the information of properties of polymers.

CO4: Attain information about additives to be used to prepare polymers which are useful for different purposes.

INSTRUMENTAL METHODS OF ANALYSIS

CO1: Obtain the knowledge of the processing of experimental data to find the error of analysis.

CO2: Acquire the knowledge of analysis of materials by using I.R. spectroscopy and its applications in quality assurance and quality control.

CO3: Attain advanced knowledge on UV and Visible spectroscopy which helps in identification of impurities and conjugation in organic compounds and biological macro molecules in research.

CO4: Get information about separation of mixtures by using latest developments in chromatography and molecular structure determination by mass spectroscopy.

ANALYSIS OF DRUGS, FOODS, DAIRY PRODUCTS & BIO-CHEMICAL ANALYSIS

CO1: Acquire knowledge about the preparation and analysis of some important drugs used as antipyretics, analgesics, antibiotics and for the treatment of malaria, and tuberculosis.

CO2: Attain knowledge about the preparation and analysis of some important antihistamine drugs.

CO3: Obtain knowledge about the preparation and analysis of some important antiepileptic, anticonvulsant, cardiovascular drugs and diuretics.

CO4: Understand the analysis of milk products and other food items and its importance in identification of adulteration through which to build a healthy nation.

FUEL CHEMISTRY AND BATTERIES

CO1: Acquire knowledge about the renewable and non-renewable energy resources as fuels, their consumption and uses in various industries.

CO2: Understand about the different types of petroleum products and their applications.

CO3: Come to know how many useful compounds are present in crude petroleum, some synthetic fuels and lubricants

CO4: Able to generate an electric current in an electro chemical cell which is basis of all batteries and fuel cells.

INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

CO1: Able to grasp the information about the manufacturing and properties of cement, glass and ceramics which are very useful in daily life and how to improve their qualities according the wishes of consumers.

CO2: Can analyse the importance of various fertilizers used for different crops growth.

CO3: Can apply the knowledge of surface coatings in various fields.

CO4: Can able to create new explosives.

ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS

CO1: Acquire the knowledge of analysis of soaps, paints, oils, fertilizers, fuels, glass and cement.

CO2: Can apply this knowledge in various industries.

CO3: Can analyse the importance of fertilizers in agriculture for better yields of crops.

CO4: Can able to create/develop new methods for determinations.

ORGANIC SPECTROSCOPIC TECHNIQUES

CO1: Acquire the knowledge of the latest developments in NMR spectroscopy in the structure determination of organic compounds in research and other related fields.

CO2: Understand the applications of NMR spectroscopy in different fields such as diagnosis, etc.

CO3: Attain the theoretical basis of UV-Visible spectroscopy in structure determination of unsaturated compounds in research and pharma industry.

CO4: Get the knowledge of ESR spectroscopy which is useful in the identification of free radicals in biological systems and other fields.

ADVANCED ORGANIC REACTIONS

CO1: Acquire knowledge about the effect of light on different organic reactions and various physical and chemical processes involved in it.

CO2: Understand the reaction mechanisms of various photochemical reactions to get important compounds in green method.

CO3: Get knowledge on how to anchor some of the functional groups in chemical reactions at various levels to get desired products in good yields.

CO4: Attain information about some recently invented reactions to prepare the important compounds.

PHARMACEUTICAL AND MEDICINAL CHEMISTRY

CO1: Get aware of the terms used in pharmaceutical chemistry and their importance in drug industry and society.

CO2: Obtain the information of some of the basic things about the drugs/medicines which are useful in prevention of some of the diseases.

CO3: Acquire knowledge on the synthesis and activity of some important drugs used for the treatment of most occurring diseases and disorders.

CO4: Get detailed knowledge about HIV-AIDS, its preventive methods, drugs used for that and thereto keep the society healthy and wealthy.

ORGANIC PREPARATIONS LAB

CO1: Obtain experimental knowledge about the preparation of some drugs which are used for the society to diagnose, cure and prevent diseases.

CO2: Skilled persons will be produced by whom pharma industry flourishes and so nation's wealth increases. i.e. employability will be achieved.

CO3: Can able to analyse the routes, reagents and conditions used to get required compound in high yields.

CO4: Can able to create new methods of preparation.

INSTRUMENTAL METHODS OF ANALYSIS LAB

CO1: Acquire hands-on expertize about the usage of instruments instead of classical methods.

CO2: Obtain knowledge about how errors are minimized during experiments using instruments.

CO3: Get aware of some of the important instruments used in medicine for diagnosing some diseases in a very short time which is very useful for the patients and the welfare of the society.

CO4: Skilled persons will be produced through which economy of the nation increases. Get employability skills and helps in life settlement.

PROJECT

CO: Get knowledge about how to do a project, how to do documentation and how to submit the dissertation.

ENGLISH-1

GENERAL ENGLISH-1

CO1- The students attain a good knowledge on viewing society in inspirational way.

CO2- This inspires the students to know the effectively in writing and speaking..

CO3- Demonstrate the use of good vocabulary and writing skills.

CO4- Acquire ability to use soft skills in professional and daily life.

GENERAL ENGLISH-2

CO1- The students attain a good knowledge on viewing society in inspirational way.

CO2- This inspires the students to know the colonizing nature of developed countries.

CO3- Regarding the philosophy observation on society.

CO4- Improve writing skills independently for future needs.

GENERAL ENGLISH-3

CO1-The students participate confidently in any social interactions.

CO2- Demonstrate the use of critical thinking and face any professional discourse.

CO3- Regarding the philosophy observation on society.

CO4- The students enhance conversational skills by observing the professional interviews.

BUSINESS COMMUNICATION

Co1-The students understand the types of business communication and its correspondence.

Co2-This inspires the students to know the effectively in writing and reading.

Co3- Acquire knowledge in preparing good business communication.

Co4- Acquire awareness to prepare agenda for a meeting, circulation of minutes & Minutes of the meeting.

COMMUNICATION AND SOFT SKILLS-2

Co1-Students attain a good level of understanding on the sounds of English.

Co2-Students could manage good intonation with beautiful word accent.

Co3-The speaking skills will be improved with good conversation, interview, presentation and public speaking.

Co4-The students possess good speaking skills with Role play, Debate and Group Discussion.

COMMUNICATION AND SOFT SKILLS-3

CO1-Students attain good soft skills with positive attitude, good body language and their own SWOT analysis. They develop good emotional intelligence with netiquette manners.

CO2-Students develop good paragraph writing with development of ideas and coherence with structure of paragraph.

CO3-Students develop a material idea on paraphrasing and Summarizing.

CO4-They learn techniques of paraphrasing and stages of Summarizing.

SANSKRIT

SANSKRIT POETRY

CO1: To identify and describe distinct charectristics of literary texts.
CO2: To analyze poetic works for their structure and meaning,using correct terminology.
CO3: To display a working knowledge of the genres of poetry by various writers from various cultures and historical eras.
CO4: To gain knowledge on effectively communicate ideas related to the poetic works during class and group activities.

SANSKRIT PROSE

CO1: To gain knowledge it is an important to know the prose forms from the Aranyakas and ancient Upanishads.
CO2:To gain ethical values by reading stories in Sanskrit prose like Panchatanta and Hitopadesa.
CO3:To Improve the knowledge and spoken skill.
CO4:To know the different varieties of people in conversation and inturn improve their knowledge and communication skill.

SANSKRIT GRAMMAR

CO1: By learning Sanskrit grammar one can write and speak correctly and effectively.
CO2: Communicationskills and vocabulary is developed while reading Sanskrit Grammar.
CO3: Able to read and write Devanagari script correctly.

DRAMA

CO1: To gain knowledge on the origin and development of Sanskrit drama .
CO2: To have Skill on conversational language(dialogue)
CO3: By reading Charectors in dramas one can gain knowledge on character building.

UPANISHADS

CO1: Importance of memory power through ancient oral teachings is recognised.

LITERATURE

CO1:By reading Sanskrit literature one can know the different types of literary aspects.

TELUGU

OLD POETRY –

CO1: Students know about the ethical values and morals.
CO2: Students gain the knowledge about How to approach and maintain the administration grounds.
CO3: Students know about the Personality Development.
CO4: To know the Knowledge of Culture, Heritage.
CO5: Students Increases the Skills in Languages and Literature of Telugu Language

MODERN POETRY-

CO1: Students know about the Writing skills in Poetry
CO2: Students gain the knowledge about Story writing
CO3: Students know about Using the language in different Dialects
CO4: To know the Knowledge How to improve various characterizations in daily life.
CO5: Student Increases the Skills in Language and Literature of Telugu Language.

PROSE

CO1: It improves story writing skills by reading of prose lessons the students will know the differences between old and new stories of telugu literature.
CO2: It helps to develop the sentence constructions in drafting.

GRAMMAR

CO1: The Grammar knowledge improves the student's ability to understand Telugu language and Texts properly.
CO2: The Students have the better opportunities in the fields as Lyric writers, Script writers , Anchors, Oraters, in both Print and Electronic media.

HINDI

HINDI-1

CO1 To develop sensitivity towards use of Hindi in the process of communication

CO2 To have knowledge on grammatical aspects and punctuation marks for proper written communication

CO3 To Utilize digital literacy tools to develop grammar skills.

CO4 To Produce appropriate vocabulary and correct word forms to improve spoken and written communication in Hindi.

HINDI-2

CO1 To improve the language skills further - Listening, Speaking, Reading & Writing

CO2 To understand the moral values and life skills taught indirectly through the lessons - Poems, short stories, and essays

CO3 To equip oneself with the improved communicative Hindi skills - with practice in writing and speaking

CO4 To develop creative thinking by going through the poetry, short stories, plays, etc.

HINDI-3

CO1 To gain the ability to Produce appropriate vocabulary and correct word forms

CO2 To Demonstrate ability to think critically by analysing the prescribed lessons from socio-cultural perspective

CO3 To develop creative thinking by analysing the prescribed texts and attemping writing general essays in Hindi

CO4 To develop interest in Hindi Literature by appreciating the prescribed as well as external works of literature through regular reading