V. S. R. Government Degree & P.G College
Movva -521 135
Department of Physics

B.Sc. PHYSICS SYLLABUS for Mathematics Combinations

Course outcomes:

On successful completion of this course, the students will be able to

Course-I: MECHANICS, WAVES AND OSCILLATIONS	1. Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross section. 2. Apply the rotational kinematic relations, the principle and working of gyroscope and it applications and the precessional motion of a freely rotating symmetric top. 3. Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation. 4. Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence. 5. Examine phenomena of simple harmonic motion and the distinction between undamped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator. 6. Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical systems. 7. Figure out the formation of harmonics and overtones in a stretched string and acquire the knowledge on Ultrasonic waves, their production and detection and their applications in different fields.
Practical Course 1: Mechanics, Waves and Oscillations	1. Perform experiments on Properties of matter such as the determination of moduli of elasticity *viz.*, Young's modulus, Rigidity modulus of certain materials; Surface tension of water, Coefficient of viscosity of a liquid , Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values. 2. Know how to determine the acceleration due to gravity at a place using Compound pendulum and Simple pendulum. 3. Notice the difference between flat resonance and sharp resonance in case of volume resonator and sonometer experiments respectively. 4. Verify the laws of transverse vibrations in a stretched string using sonometer and comment on the relation between frequency, length and tension of a stretched string under vibration.

	5. Demonstrate the formation of stationary waves on a string in Melde's string experiment. 6. Observe the motion of coupled oscillators and normal modes.
Course-II: WAVE OPTICS	1. Understand the phenomenon of interference of light and its formation in (i) Lloyd's single mirror due to division of wave front and (ii) Thin films, Newton's rings and Michelson interferometer due to division of amplitude. 2. Distinguish between Fresnel's diffraction and Fraunhoffer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating. 3. Describe the construction and working of zone plate and make the comparison of zone plate with convex lens. 4. Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity.. 5. Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasers and their applications in different fields. 6. Explain about the different aberrations in lenses and discuss the methods of minimizing them. 7. Understand the basic principles of fibre optic communication and explore the field of Holography and Nonlinear optics and their applications.
Practical Course II: Wave Optics	1. Gain hands-on experience of using various optical instruments like spectrometer, polarimeter and making finer measurements of wavelength of light using Newton Rings experiment, diffraction grating etc. 2. Understand the principle of working of polarimeter and the measurement of specific Rotatory power of sugar solution. 3. Know the techniques involved in measuring the resolving power of telescope and dispersive power of the material of the prism. 4. Be familiar with the determination of refractive index of liquid by Boy's method and the determination of thickness of a thin wire by wedge method.
Course-III: HEAT AND THERMODYNAMICS	1. Understand the basic aspects of kinetic theory of gases, Maxwell-Boltzman distribution law, equipartition of energies, mean free path of molecular collisions and the transport phenomenon in ideal gases. 2. Gain knowledge on the basic concepts of thermodynamics, the first and the second law of thermodynamics, the basic principles of refrigeration, the concept of entropy, the thermodynamic potentials and their physical interpretations. 3. Understand the working of Carnot's ideal heat engine, Carnot cycle and its efficiency. 4. Develop critical understanding of concept of Thermodynamic potentials, the formulation of Maxwell's equations and its applications.

	5. Differentiate between principles and methods to produce low temperature and liquefy air and also understand the practical applications of substances at low temperatures. 6. Examine the nature of black body radiations and the basic theories.
Practical Course-III: Heat and Thermodynamics	1.Perform some basic experiments in thermal Physics, viz., determinations of Stefan's constant, coefficient of thermal conductivity, variation of thermo-emf of a thermocouple with temperature difference at its two junctions, calibration of athermocouple and Specific heat of a liquid.
Course-IV: ELECTRICITY, MAGNETISM AND ELECTRONICS	1. Understand the Gauss law and its application to obtain electric field in different cases and formulate the relationship between electric displacement vector, electric polarization, Susceptibility, Permittivity and Dielectric constant. 2. Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances. 3. Understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents. 4. Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves. 5. Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Qfactor, Power factor and the comparative study of series and parallel resonant circuits. 6. Describe the operation of p-n junction diodes, zener diodes, light emitting diodes and transistors. 7. Understand the operation of basic logic gates and universal gates and their truth tables.
Practical Course IV: Electricity, Magnetism and Electronics	1. Measure the current sensitivity and figure of merit of a moving coil galvanometer. 2. Observe the resonance condition in LCR series and parallel circuit. 3. Learn how a sonometer can be used to determine the frequency of AC-supply. 4. Observe the variation of magnetic field along the axis of a circular coil carrying current using Stewart and Gee's apparatus. 5. Understand the operation of PN junction diode, Zener diode and a transistor and their V-I characteristics. 6. Construct the basic logic gates, half adder and full adder and verify their truth tables. 7. Further, the student will understand how NAND and NOR gates can be used as universal building blocks.

Course V: MODERN PHYSICS	1. Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics. 2. Develop critical understanding of concept of Matter waves and Uncertainty principle. 3. Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications. 4. Examine the basic properties of nuclei, characteristics of Nuclear forces, salient features of Nuclear models and different nuclear radiation detectors. 5. Classify Elementary particles based on their mass, charge, spin, half life and interaction. 6. Get familiarized with the nano materials, their unique properties and applications. 7. Increase the awareness and appreciation of superconductors and their practical applications.
Practical Course V: Modern Physics	1. Measure charge of an electron and e/m value of an electron by Thomson method. 2. Understand how the Planck's constant can be determined using Photocell and LEDs. 3. Study the absorption of α-rays and β-rays, Range of β-particles and the characteristics of GM counter. 4. Determine the Energy gap of a semiconductor using thermistor and junction diode.

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VSR GOVERNMENT DEGREE & P.G COLLEGE, MOVVA
DEPARTMENT OF BOTANY

NAME OF THE PROGRAMME: B.Z.C/BT.B.C-(BOTANY)

PROGRAMME OUTCOMES (PO):

PO1. Knowledge and understanding: Origin of life, diversity of plants in terms of structure, function, reproduction and ecological roles. Plant systematics, role of plants in ecosystem and different phytogeographic regions of India and World.

PO2. Intellectual skills: Student able to carry out independent survey or research in various areas of the subject. Logical interpretation of ideas and concepts into a organised form by searching in internet.

PO3. Practical skills: Giving opportunities to students to handle equipments, conduct experiments practically both in field and laboratory.

PO4. As a Botanist: Aware and understand local plant resources, assess and access plant diversity, its importance for society and ecology, health and hazards, legal and environmental issues and conservation of biodiversity practice with responsibility.

PO5. Ethics: Students will able to learn ethical principles to mitigate environmental issues and biodiversity conservation

PO6. Acquire the skills in handling scientific instruments, scientific data collection and developing logical and scientific conclusions.

PO7. Promote students to go for Higher Education and also employment opportunities in industries, diagnostics, quality control and research

PROGRAMME SPECIFIC OUTCOMES (PSO):

PSO1. Develop the fundamental skills to function effectively as professionals and continue learning within the field of Biology.

PSO2. Learn modern technologies in multidisciplinary environment and apply appropriate techniques, resources to explore plants.

PSO3. Create an awareness of the impact of chemistry on the environment, society, appraise role of green chemistry in environment sustainability.

COURSE OUTCOMES OF BOTANY (CO):

SEM-I- Theory

Title of the Paper: Fundamentals of Microbes and Non-vascular plants	
Course Code: **1003BOT20**	
At the completion of this course a student will be able to:	
CO-1	Understand origin of life on the earth, diversity among viruses and transmission of plant viral diseases and their control
CO-2	Understand prokaryotic cell structure, mode of nutrition, reproduction special groups of bacteria
CO-3	Understand and identify morphological characters, reproduction in Fungi & Lichens (Rhizopus and Puccinia) and economic importance
CO-4	Understand and describe the characteristics and life history of Algae (*Spirogyra* and Polysiphonia), its economic importance
CO-5	Understand, Recall and explain the evolutionary trends among amphibians of plant kingdom for their shift to land habitat

SEM-I- Practical

Title of the Paper: Fundamentals of Microbes and Non-vascular plants	
Course Code: **1003BOT20PE**	
At the completion of this course a student will be able to:	
CO-1	Demonstrate the techniques of use of lab equipment, preparing slides and identify the material and draw diagrams exactly as it appears
CO-2	Observe and identify microbes and lower groups of plants on their own
CO-3	Understand and identify morphological and reproductive structures of algae
CO-4	Understand and identify the external and reproductive structures of fungi (Phytophthora, Albugo, Penicillium and Puccinia)
CO-5	Identification of Tobacco mosaic disease, Citrus canker and Blast of Rice

SEM-II-Theory

Title of the Paper: Basics of Vascular Plants & Phytogeography	
Course Code: **2003BOT20**	
At the completion of this course a student will be able to:	
CO-1	Understand the diversity of habitats, Classify and compare Pteridophytes based on their morphology, anatomy, reproduction and life cycles
CO-2	Understand the morphological structure and life history of Gymnosperrms
CO-3	Critically understand various taxonomical aids for identification of Angiosperms and distinguishing features of various systems of classification.
CO-4	Analyze the morphology of the most common Angiosperm plants of their localities and recognize their families.
CO-5	Understand and Locate different phytogeographical regions of the world and India and can analyze their floristic wealth.

SEM-II-Practical

Title of the Paper: Basics of Vascular Plants & Phytogeography	
Course Code: **2003BOT20PE**	
At the completion of this course a student will be able to:	
CO-1	Demonstrate the techniques of section cutting, preparing slides, identifying of the material and drawing exact figures.
CO-2	Compare and contrast the morphological, anatomical and reproductive features of vascular plants
CO-3	Identify the local angiosperms of the families prescribed to their genus and species level and prepare herbarium
CO-4	Exhibit skills of preparing slides, identifying the given twigs in the lab and drawing figures of plant twigs, flowers and floral diagrams as they are.
CO-5	Prepare and preserve specimens of local wild plants using herbarium techniques

SEM-III: Theory

Title of the Paper: Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity	
Course Code: **3003BOT20**	
At the completion of this course a student will be able to:	
CO-1	Imparting an insight into organization of tissues and tissue systems in plants Understand the internal structure of the most evolved group of plants Angiosperm.
CO-2	Understand, Illustrate and interpret various aspects of Angiosperm embryology
CO-3	Discuss the basic concepts of plant ecology, and evaluate the effects of environmental and biotic factors on plant communities
CO-4	Appraise various qualitative and quantitative parameters to study the population and community ecology
CO-5	Understand; Correlate the importance of biodiversity and consequences due to its loss. Enlist the endemic/endangered flora and fauna from two biodiversity hot spots in India and assess strategies for their conservation

SEM-III: Practical

Title of the Paper: Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity	
Course Code: **3003BOT20PE**	
At the completion of this course a student will be able to:	
CO-1	Get familiarized with techniques of section making, staining and microscopic study of vegetative, anatomical and reproductive structure of plants
CO-2	Observe externally and under microscope, identify and draw exact diagrams of the material in the lab
CO-3	Demonstrate application of methods in plant ecology and conservation of biodiversity and qualitative and quantitative aspects related to populations and communities of plants

CO-4	Can understand hot spots of biodiversity
CO-5	Able to recognize different threatened group of plants.

SEM-IV Paper-IV Theory

Title of the Paper: Plant Physiology and Metabolism	
Course Code: **4003BOT20A**	
At the completion of this course a student will be able to:	
CO-1	Understand plant structures in the context of physiological functions of plants in relation to water
CO-2	Understanding of the mechanisms for procurement of mineral ions by plants and mineral nutrition and the role these minerals play in organic molecule synthesis and use
CO-3	Know the physiological details of photosynthesis and metabolites synthesized by plants respiration.
CO-4	Learn detailed pathway of carbohydrate metabolism
CO-5	Learn about the growth and development of plants and its regulations.

SEM-IV Paper-IV Practical

Title of the Paper: Plant Physiology and Metabolism	
Course Code: **4003BOT20APE**	
At the completion of this course a student will be able to:	
CO-1	Understand the concept of Osmosis, Water potential through Rheodiscolor leaf
CO-2	Demonstrate the process of Transpiration through cobalt chloride and Ganong's photometer
CO-3	Isolate different photosynthetic pigments chromatographic technique
CO-4	Identify the deficiency of different mineral elements through photographs
CO-5	Understand the path of water in plant body through Ascent of sap

SEM-IV: PAPER-V Theory

Title of the Paper: Cell biology, Genetics and Plant breeding	
Course Code: **4003BOT20B**	
At the completion of this course a student will be able to:	
CO-1	Distinguish prokaryotic and eukaryotic cells and design the model of a cell Understand and explain the structure and composition of plant cell wall, plasma membrane
CO-2	Understand the morphology, types, structure and organization of DNA in Chromosomes
CO-3	Understand Mendelian laws of inheritance and concepts of Linkage and Crossing over in inheritance

CO-4	Understand the traditional plant breeding methods and selection process for improved varieties
CO-5	Understand the importance of biotechnology in Crop improvement using mutations, Somaclonal variations and molecular markers

SEM-IV: PAPER-V Theory

Title of the Paper: Cell biology, Genetics and Plant breeding	
Course Code: **4003BOT20BPE**	
At the completion of this course a student will be able to:	
CO-1	Understand the structure of a plant cell and it's organelles
CO-2	Understand and study various stages of mitosis and DNA packing through micrograph
CO-3	Study the effect of temperature on permeability of cell membrane
CO-4	Solve numerical problems on Mendel's laws of inheritance
CO-5	Understand and demonstrate emasculation and bagging in hybridization technique

SEM-V PAPER-VIC-Theory

Title of the Paper: Plant Tissue Culture	
Course Code: **5003BOT20A**	
At the completion of this course a student will be able to:	
CO-1	Understand the basic principles and methodology involved in plant tissue culture
CO-2	Identify various facilities required to set up a plant tissue culture laboratory
CO-3	Acquire a critical knowledge on sterilization techniques related to plant tissue culture
CO-4	Demonstrate skills of callus culture through hands on experience.
CO-5	Understand the biotransformation technique for production of secondary metabolites

SEM-V PAPER-VIC-Practical

Title of the Paper: Plant Tissue Culture	
Course Code: **5003BOT20APE**	
At the completion of this course a student will be able to:	
CO-1	Identify and handle various equipment in plant tissue culture lab
CO-2	Learn the procedures of preparation of media.
CO-3	Demonstrate skills on inoculation, establishing callus culture and Micro propagation
CO-4	Acquire skills in observing and measuring callus growth
CO-5	Perform some techniques related to plant transformation for secondary Metabolite production

SEM-V PAPER-VIC-Theory

Title of the Paper: Mushroom Cultivation	
Course Code: **5003BOT20B**	
At the completion of this course a student will be able to:	
CO-1	Understand the structure and life of a mushroom and discriminate edible and poisonous mushrooms
CO-2	Identify the basic infrastructure to establish a mushroom culture unit
CO-3	Demonstrate skills preparation of compost and spawn
CO-4	Acquire a critical knowledge on cultivation of some edible mushrooms
CO-5	Explain the methods of storage, preparation of value-added products and marketing

SEM-V PAPER-VIC-Theory

Title of the Paper: Mushroom Cultivation	
Course Code: **5003BOT20BPE**	
At the completion of this course a student will be able to:	
CO-1	Identify and discriminate different mushrooms based on morphology
CO-2	Understand facilities required for mushroom cultivation
CO-3	Demonstrate skills on preparation of spawn, compost and casing material.
CO-4	Exhibit skills on various cultivation practices for an edible mushroom
CO-5	Understand Value Added Products.

EMPLOYMENT OPPORTUNITIES:

After completion of this course students can get employment in:

- Botanical survey of India.
- National and International Virology laboratories.
- Biodiversity conservation centers.
- Plant growth centers.
- Biology instrumentation labs.
- Molecular Biology Research centers.
- Biotechnology research centers.
- National and International Forensic laboratories.

	Course Outcomes of Commerce Department
	Financial Accounting
	Course Outcome:
CO-I	Preparing financial statements in accordance with appropriate standards.
CO-I I	Prepare ledger accounts using double entry bookkeeping and record journal entries accordingly
CO-III	Interpreting the business implications of financial statement information
CO-IV	Preparing accounting information for planning and control and for the evaluation of finance.
CO-V	Prepare Bank reconciliation statement from incomplete statement
CO-VI	Explain the purpose of double entry system to understanding the accounting system properly. Preparation of ratification errors.
	Business organisation and management
CO –I	To provide introduction about business organization
CO –II	To make them aware about different forms of business
CO –III	To develop knowledge about evolution of management thoughts
CO –IV	To better understanding of planning and decision making
CO –V	To give an idea about organisation structure and different types of organisation
CO-VI	To make them familiarize with recruitment process and stages in selection
CO-VII	To provide idea about motivation, importance of communication and Principles of coordination
	Business Environment
CO –I	To make the students aware about the Business and Business Environment.
CO –II	To develop entrepreneurial awareness among students.
CO –III	To motivate students to make their mind set for thinking entrepreneurship as career.
	Business Economics
CO –I	To provide students knowledge of Micro Economic concepts and inculcate an analytical approach to the subject matter.
CO –II	To arouse the students interest by showing the relevance and use of various economic theories.
CO –III	To apply economic reasoning to solve business problems.
	Banking Theory & Practice
CO –I	To familiar the students with the fundamentals of banking operations
CO –II	To build up the capability of for knowingBanking concepts and operations.
CO –III	To make the students aware of banking business and practices.

CO –IV	To make understandable to the students regarding th new concepts introduced in the banking system.
	Advanced Accounting
CO –I	To provide knowledge of various accounting concepts
CO –II	To impart the knowledge about accounting methods, procedures and Techniques.
CO –III	To acquaint students with practical approach to accounts writing by using software package and by learning various accounts.
	BUSINESS STATISTICS:
CO –I	To familiarizes the concept of statistics
CO –II	To provide practical exposure on calculation of measures of average
CO –III	To provide practical exposure on calculation of measures of correlation and irrigation
CO –IV	To introduce the students about the concept of provability
CO –V	To provide practical exposure on calculation of trend analysis
	MARKETING
CO –I	To develop an idea about marketing and its functions
CO –II	To enhance the students on consumer behaviour
CO –III	To familiarize students about product and its classifications
CO –IV	To make them understand pricing policies
CO –V	To introduce the concept of sales forecast
	Corporate Accounting
CO –I	Enable the students to understand about amalgamation , absorption and external reconstruction
CO –II	To make them aware about accounts of banking companies
CO –III	Keep them aware about accounts of insurance companies
CO –IV	Enable the students to gain an idea of liquidation of companies
CO –V	To introduce and develop knowledge of holding companies accounts
	COST ACCOUNTING
CO –I	Aimed to familiarize the concept of cost accounting
CO –II	Helps to gather knowledge on preparation of cost sheet in its practical point of view
CO –III	To facilitate the idea and meaning of material control with pricing methods
CO –IV	Develop the knowledge about remuneration and incentives
CO –V	To introduce the concept of overhead cost.
	MANAGEMENT ACCOUNTING
CO –I	To enlighten the students thought and knowledge on management Accounting
CO –II	Helps to give proper idea on financial statement analysis in practical point of view
CO –III	To introduce the concept of fund flow and cash flow statement

CO –IV	To provide knowledge about budget control keeping in mind the scope of the concept
CO –V	To develop the know-how and concept of marginal costing with practical problems
	Income tax
CO –I	The student will be versed in the fundamental concepts of different aspects of income tax.
CO –II	The students can understand Income Tax system properly, and can get the knowledge of different tax provisions.
CO –III	To give knowledge about Submission of Income Tax Return, Advance
	Tax, and Tax deducted at Source, Tax Collection Authorities under the
	Income Tax Act, 1961
	Business Laws
CO –I	Make the students understand about business and corporate law
CO –II	Develop knowledge on contract and various types of contracts
CO –III	To help the students to understand the concept of sale of goods
CO –IV	Make the students understand about companies and its types
CO –V	To equip the students with proper knowledge about Foreign exchange
	Auditing
CO –I	Students will be versed in the fundamental concepts of Auditing
CO –II	To give knowledge about preparation of Audit report,
CO –III	To provide knowledge and develop understanding of methods of audit in specialized areas.
	GOODS AND SERVICE TAX
CO –I	To enable the students to learn the concepts indirect tax and GST from the pre-GST period to post- GST period.
CO –II	To understand the importance of indirect taxes (GST) in the Indian and global economy and its contribution to the economic development.
CO –III	To comprehend the principles of taxations, objectives of taxes and its impact, shifting and incidence process of indirect taxes in the market orientated economy.
CO –IV	To understand the implications of GST on the taxable capacity consumers, dealers and of the society at large and its changes.
CO –V	To make them to be a tax consultant in preparing the tax planning, tax management. Payment of tax and filing of tax returns
	Management Theory Practice
CO1	Understand the concepts related to Business Management .
CO2	Demonstrate the roles, skills and functions of management.
CO3	Analyze effective application of PPM knowledge to diagnose and solve organizational problems and develop optimal managerial decisions.

CO4	Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.
	Business Economics
CO1	To outline expert knowledge about the concept of managerial economics, to analyze the students to understand the concepts of demand, utility and demand forecasting.
CO2	To Organize an insight in the basic features of production and cost function.
CO3	To explain the students to familiarize with different market structures and its importance
CO4	To experiment impart knowledge on the concepts of pricing and pricing policy
CO5	To understand Pricing Practices of Firms
	Business Environment
CO1	To understand the concept of business and elements of business environment
CO2	To explain the effects of government policy on the economic environment of business.
CO3	To improve the ability to recognize and manage legal risks in business decision making.
CO4	To understand and appreciate the social aspects of business.
CO5	To develop an idea of international environment and recent issues in environment.
	FINANCIAL ACCOUNTING AND PACKAGES
CO1	To understand the fundamental accounting concepts and the elements of financial statement.
CO2	To acquire the knowledge on preparation of financial statements.
CO3	To understand the financial statement analysis.
CO4	To gain knowledge on various cost management techniques
CO5	To provide hands on experience on accounting tally and gain proficiency in creating solutions in financial accounts and management.
	INFORMATION TECHNOLOGY FOR BUSINESS
CO1	To explain the role of Information Technology in Business
CO2	To illustrate the Information Technology Infrastructure
CO3	To describe Information Systems Support to for Business Functions
CO4	To represent Data, Knowledge and Implication of Decision Support Systems
CO5	To relating Strategic Advantage and Information Technology
	QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS
CO1	To provide students with knowledge of mathematical models for quantitative analysis of managerial problems in Industry
CO2	To develop the ability to evaluate the forecasting models like correlation and regression analysis.
CO3	To enable the students understanding probability concepts and its applications in business.
CO4	To evaluate the probability distributions and its applications in industry.
CO5	To understand the significance of testing of hypothesis in managerial decision-making.
	BUNINESS LAWS

CO1	To familiarize the students with the various provisions of Company Act related to health, safety and welfare and SEBI Guidelines.
CO2	To enable the students to understand Prevention of Money Laundering Act
CO3	To provide conceptual understanding about Competition Act and Consumer Protection Act
CO4	To equip the students with the basic concepts of FEMA and Cyber Laws
CO5	To impart knowledge on Business Ethics, Ethical practices and guidelines
	RESEARCH METHODOLOGY
CO1	To understand basic concepts of research and formulate research problems and process.
CO2	To generate an awareness of research design and data collection methods.
CO3	To develop and understand of sampling design and techniques.
CO4	To understand how to analyse and interpretation of the data.
CO5	To provide expert knowledge about to write a research report and thesis
	HUMAN RESOURCE MANAGEMENT
CO1	To cover the basic concepts of Human Resource management
CO2	To contribute the development of human resource planning, implementation, and evaluation of employee recruitment, selection, and retention plans and processes)
CO3	To develop, implement, and evaluate employee orientation, training, and development programs
CO4	To develop, implement, and evaluate employee orientation, training, and development programs
CO5	To administer and contribute to the design and evaluation of the performance management program
CO6	To develop the students' ability to learn concepts like compensation, employee welfare, and industrial relation issues
	MARKETING AND PUBLIC RELATIONS
CO1	Understand the concepts of marketing and to know the changing context of marketing environment.
CO2	Appreciating the knowledge of consumer behavior in implementing the marketing strategies to satisfy target customer and also distinguish between Marketing Information System and Market Research
CO3	Conceptual understanding of product management and issues relating with marketing of services
CO4	Understand different price strategies and the dynamics of channel management

CO5	Be able to know the elements of promotion mix and the importance of integrated marketing communications
	FINANCIAL MANAGEMENT
CO1	To understand theperspective on financial management function in the company and in its relation to domestic and international economy.
CO2	To provide illustration on financial management practices and policies, processes, techniques and strategies those are used in the financial management.
CO3	To develop knowledge on the type and characteristics of problems and the possibility of the occurrence of financial management problems,
CO4	To develop planning skill and monitoring skill in financial management functions effectively
CO5	To apply the appropriate working capital management strategy to face the company challenges
	E-BUSINESS
CO1	To remember and understand the basic concepts of E-commerce, E-business Internet and World Wide Web
CO2	To understand how different technologies are implemented in e-Business.
CO3	To analyse the role of e-marketing and advertisements in e- Business
CO4	To analyse the impact of CRM and SCM on e-Business.
CO5	To learn about different types of electronic payment system, protocols, security schemes and cash less economy.
	MS EXCEL &TALLY PRACTICALS (1L + 1T + 1P)
CO1	To familiarize Students with basic to intermediate skills for using Excel in the classroom vis-à-vis Business Applications,
CO2	To provide students hands on experience on MS Excel Utilities,
CO3	To gain proficiency in creating solutions for Data Management and Reporting.
CO4	To provide hands on experience on accounting tally and gain proficiency in creating solutions in financial account and management

CO5	To acquire knowledge on ledger creation and inventory creation.
	BUSINESS COMMUNICATION SKILLS
CO1	To explain the importance of business correspondence and differentiate between formal and informal communication.
CO2	To impart knowledge in completing forms and learning and understanding the different accents and dialects
CO3	To prepare and deliver effective business presentation with modern days technology.
CO4	To develop the art of business reporting system with good vocabulary and with lucid numerical presentations
CO5	To explain the importance of feedback mechanism motivating others and building team management skills.
	ENTREPRENEURSHIP DEVELOPMENT & BUSINESS MODELS
CO1	To understand the concept of Entrepreneurship and role of women entrepreneurs.
CO2	To know the importance of ideas in entrepreneurship and the ability to assess business potentiality of ideas.
CO3	To know the need for financial planning and preparation of business plans.
CO4	To analyze various business models in the emerging scenario.
CO5	To provide insights of business excellence models
	ADVANCED COST ACCOUNTING
CO1	To understand the basic concepts and processes used to determine product costs. And to interpret cost accounting statements.
CO2	To analyse and evaluate information for cost ascertainment in process, batch and job costing.
CO3	To analyse and evaluate the methodology for costing of operating and service industry
CO4	To scrutinize various types of manufacturing waste and present a comprehensive cost system for recognizing and reporting waste costs.

CO5	To appraise the need for reconciliation between cost and financial accounts along with the preparation of a reconciliation statement. And explain the utility – concept and preparation of different types of budgets.
	FINANCIAL STATEMENT ANALYSIS
CO1	To make student aware of the concepts, principles, and objectives of Financial Statement.
CO2	To provide an understanding of Gabelli Utility Trust Balance Sheet .Earnings etc.
CO3	To develop an idea of Ratio Analysis and Classifications of Ratios.
CO4	To acquaint the students with the various Statement of Changes of Financial Ratios
CO5	To understand the Methods of Calculating Cash Flows from Operating Activities
	TAX PLANING AND MANAGEMENT
CO1	To develop of the course is to make student aware of the concepts, functions, processes and practices of Measures of the State for Tax Evasion .
CO2	Students are able to understand the benefits and perquisites of salaried persons.
CO3	It provides an understanding of the tax planning for firms and Hindu Undivided Family.
CO4	It provides an understanding of the tax planning on managerial decisions.
CO5	Students are able to understand the tax planning on foreign collaborations and joint ventures.
	GOODS AND SERVICE TAX-1
CO1	To develop an idea about GST, CGST, SGST and IGST.
CO2	To have an idea on GST Act 2017.
CO3	To understand the registration process in GST.
CO4	To understand various problems and advantages on input tax credit.
CO5	To know the importance of practical work in GST.
	Event Management
CO1	To develop orientation towards Event Management: Design, Size and Types of Events – Event Team – Code of Ethics.
CO2	To have an idea of Event Marketing – Marketing Mix – Sponsorship. Promotion.
CO3	To understand Developing the Theme – Conducting Rehearsals – Providing Services: Catering, Accommodation – Managing the Environment

CO4	To understand Managing Meetings. Operations and Logistics: Logistics – Policies – Procedures – Performance Standards – Functional Areas
CO5	To know the importance of Occupational Safety and Health – Incident Reporting, Crowd Management and Evacuation: Crowd Management Plan – Major Risks Management
	MOOCS
CO1	To provide students with audio and video content relating with the contemporary subjects.
CO2	To improve the self-learning capabilities of the students
CO3	To help the learners to learn continuously while doing the course and after the course completion.
CO4	To provide opportunity for learner to interact directly with world class teachers who are offering courses on MOOCs platform.
CO5	To expose the learners with peer learning facility
	INTERNATIONAL BUSINESS
CO1	To identify the new projects of International Business
CO2	To understand Role of world Trade Organization (WTO
CO3	To develop Foreign exchange market mechanism
CO4	To enable the students to understand The European Union and NAFTA
CO5	To imparts skills in the Developing global competitiveness
	CORPORATE ACCOUNTING
CO1	To understand financial statements (comprising statement of comprehensive income, balance sheet, statement of cash flow, statement of changes in equity and notes to accounts) from a user perspective such an equity investor, lender, financial analyst and management.
CO2	To analyse the user perspective on the role of International financial reporting system
CO3	To describe the importance of valuation of shares and elaborate the methods of valuation of shares.
CO4	To prepare the consolidated statement of financial statement and the consolidated statement of profit or loss.

CO5	To know the concepts of new trends in inflation accounting and human resource accounting
	MANAGEMENT & COST AUDIT
CO1	Understand importance of Managerial uses of cost and management audit
CO2	Describe the Techniques for assessing managerial efficiency
CO3	Develop user perspective on Familiarity with industry cost structure-Precautions for including Cost Audit Report.
CO4	Prepare the method of Post checking work..
CO5	Know the concepts and new trends in Process of manufacturing-various expenses-Sales Prescribed.
	GOODS AND SERVICE TAX & CUSTOMS
CO1	The objective of the course is to make student aware of the concepts, functions, processes and practices of GST.
CO2	Students are able to understand SGST, CGST, and IGST.
CO3	It provides an understanding of procedure for registrations and filing process of GST returns.
CO4	To acquaint the students with different duties which are involved in Customs Act.
CO5	Students are able to understand the valuation of goods along with Customs value inclusions and exclusions.
	DIRECT TAXES
CO1	To aware of the concepts, functions, processes and practices of Income tax.
CO2	To understand the income tax exemptions under various heads and carry forward provisions.
CO3	To provide an understanding of the Calculation of income tax of agricultural income, salary income, and other incomes.
CO4	To acquaint the students with different modes of submission of income tax statements.
CO5	To understand the calculation of wealth tax and changes in wealth tax act.

Department of Political Science

POLITICAL SCIENCE Course-Outcomes	
Basic Concepts of Political Science	After Completion of this course the student would be able to: **CO1:** Analyze what is Politics and explaining the approaches to the Study of Political Science – Normative, Behavioral, Post Behavioral, Feminist. **CO2:** Assessing the theories of State (Origin, Nature, Functions): Contract, Idealist, Liberal and Neo-Liberal Theories. **CO3:** Distinguish nationality, nation and understand the Varieties of nationalism. **CO4:** Understand the civil and Social rights and distinguish universal and differential citizenship. **CO5:** Understanding basic concepts of Liberty, Equality, Rights, Law and Justice.
Political Institutions(Concepts, Theories and Institutions)	After Completion of this course the student would be able to: **CO1:** gain knowledge on Constitutional law, theory of separation of powers. **CO2:** understand the structural form of modern state, parliament and presidential forms. **CO3:** understand the features of federal and unitary forms of government. **CO4:** gain knowledge on democracy, models of democracy. **CO5:** Know the nature, role and functions of judiciary and understand judicial review.
Indian Constitution	After Completion of this course the student would be able to: CO1: Understand the ideological legacy of the Indian national movement on the constituent assembly. CO2: Understand the emergence, evolution, structure and composition of Indian Constitution. CO3: Know and understand the fundamental rights and directive principles and analyze the differences between them. CO4: Gain knowledge on unitary and federal features in the Indian constitution. CO5: Know the values of the Indian constitution and understand the nature and role of higher judiciary in India.
Indian Political Process	After Completion of this course the student would be able to: CO1: Understand the Indian Political Process and evaluation of party system in India. CO2: Analyze the electoral process and voting behavior in India. CO3: Gain knowledge on powers, functions and role of election commission in Indian political system. CO4: Describe various challenges to Indian democracy. CO5: Understand the need for electoral reforms and women

	representation in parliament.
Indian political thought	After Completion of this course the student would be able to: CO1: Understand the traditions of ancient Indian political thought revealed by great thinkers MANU and KAUTILYA CO2: Know the great works of RAMMOHAN ROY on religious and social reform. CO3: Analyze the drain theory and poverty theory of Dadabai Naoroji. CO4: Understand and compare the Hindu culture nationalism and Islamic Communitarian Nationalism CO5: Understand the democratic Egatitarianism of Gandhi, Jawaharlal Nehru, Dr.B.R .Ambedkar and M.N.Roy.
Western political thought	After Completion of this course the student would be able to: CO1: Understand and acquire the knowledge about classical western political thoughts of plato and aristotile. CO2: Know the early medieval to the beginning of modern thought revealed by ST.Augustine and Machiavelli. CO3: Know the liberal thoughts of Thomas Hobbes, John Locke and Rousseau. CO4: Know the liberal democratic thought of Jeremy Bentham and john Stuart mill. CO5: Understand the philosophical idealism and its critique revealed by Hegel and Karl Marx.
Principles of public administration	After Completion of this course the student would be able to: CO1: understand the nature and scope of public administration. CO2: differentiate administration theories like- Classical theory, Human relations theory and rational decision making theory. CO3: analyze the importance of co-ordination and leadership in an organization. CO4: understand the principles of organization, structure and its hierarchy. CO5: gain knowledge on theories of motivation.
International relations	After Completion of this course the student would be able to: CO1: Gain Knowledge on basic concepts of International relations. CO2: understand approaches-Idealism, classical realism and modern realism of International relations. CO3: analyze the Causes and effects of first and second world war. CO4: gain knowledge on Origins of First Cold war, new cold war and the end of cold war. CO5: understand the structure, functions and role of UNO in the protection of international peace.
Indian foreign policy	After Completion of this course the student would be able to: CO1: understand determinants, Continuity and change in Indian foreign policy.

	CO2: gain knowledge on Evolutionary growth of Non-Aligned movement. CO3: Understand the India's relations with USA and Russia. CO4: analyze India's' role in south Asian Association of regional co-operation. CO5: gain knowledge of trends in India's Foreign Policy.
Contemporary Global Issues	After Completion of this course the student would be able to: CO1: understand meaning, nature, scope and types of globalization. CO2: analyze the role of Anchors of Global Political Economy. CO3: Understand the Nation state in context of Globalization and its consequences. CO4: analyze the Contemporary global issues-Ecological and terrorism issues. CO5: gain knowledge on world trade organization and Functionality of BRICS.

Course Outcomes of Department of English

CourseOutcomes	
A Course in Communication and Soft Skills	By the end of the course the learner will be able to: ● Use grammar effectively in writing and speaking. ● Demonstrate the use of good vocabulary. ● Demonstrate an understanding of writing skills. ● Acquire ability to use soft skills in professional and daily life confidently. ● Use the tools of communication

A Course in Reading & Writing Skills	By the end of the course the learner will be able to: ● Use reading skills effectively. ● Comprehend different texts. ● Interpret different types of texts. ● Analyse what is being read ● Build up a repository of active vocabulary. ● Use good writing strategies. ● Write well for any purpose. ● Improve writing skills independently for future needs.
A Course in Conversational Skills	By the end of the course the learner will be able to: ● Speak fluently in English. ● Participate confidently in any social interactions ● Face any professional discourse. ● demonstrate critical thinking enhance conversational skills by observing professional interviews

COURSE OUTCOMES OF DEPARTMENT OF TELUGU

	Course Name	Course Outcome
1.	Classical Telugu Literature	• This course enables students to learn about the ancient history and the society. It improves the vocabulary and develops the literary Aptitude and observes Telugu poems in morphological nature. It also imbibes Subject Promoted Culture, customs, moral and literary values.
2.	Modern Telugu Literature	• This course enables the students to learn about the social situations of the people, observe the nature of the people and situations, Artist's life and their dedication about Art and also learn importance of the Arts, dignity of Labour, Aesthetic nature of the drama. • This course also empowers the knowledge of

		Telugu Language and Literature.
3.	Creative Writing	• This course enables the students to use punctuations while writing. • This course enables students to learn the primary points of the Language and characteristics of a Sentences being used in day to day life. • This course enables to improve communication skills. • It also enables to learn and write about the features of the modern poem, story and essays. • This course enables them to know about translation and difficulties that arise during translation. • This course enables them to observe and Differentiate between Print Media and Electronic Media.

COURSE OUTCOMES B.SC (COMPUTER SCIENCE)

PROBLEM SOLVING IN C	Course Learning Outcomes: Upon successful completion of the course, a student will be able to: 1. Understand the evolution and functionality of a Digital Computer. 2. Apply logical skills to analyse a given problem 3. Develop an algorithm for solving a given problem. 4. Understand 'C' language constructs like Iterative statements, Array processing, Pointers, etc. 5. Apply 'C' language constructs to the algorithms to write a 'C' language program.
OBJECT ORIENTED PROGRAMMING USING JAVA	At the end of this course student will: 1. Understand the concept and underlying principles of Object-Oriented Programming 2. Understand how object-oriented concepts are incorporated into the Java Programming language

	3. Develop problem-solving and programming skills using OOP concept 4. Understand the benefits of a well structured program 5. Develop the ability to solve real-world problems through software development in high-level programming language like Java 6. Develop efficient Java applets and applications using OOP concept 7. Become familiar with the fundamentals and acquire programming skills in the Course Outcomes
DATA STRUCTURES USING C	1. Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms 2. Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs. 3. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs 4. Demonstrate different methods for traversing trees 5. Compare alternative implementations of data structures with respect to performance 6. Compare and contrast the benefits of dynamic and static data structures implementations 7. Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack. 8. Discuss the computational efficiency.

SOFTWARE ENGINEERING	1. Ability to gather and specify requirements of the software projects. 2. Ability to analyse software requirements with existing tools 3. Able to differentiate different testing methodologies 4. Able to understand and apply the basic project management practices in real life projects 5. Ability to work in a team as well as independently on software
DATA BASE MANGEMENT SYSTEMS	**Course Outcomes** On completing the subject, students will be able to: 1. Gain knowledge of Database and DBMS. 2. Understand the fundamental concepts of DBMS with special emphasis on relational data model. 3. Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database 4. Model database using ER Diagrams and design database schemas based on the model. 5. Create a small database using SQL. 6. Store, Retrieve data in database.
OPERATING SYSTEMS	**1.** Analyse the concepts of processes in operating system and illustration of the scheduling of processor for a given problem instance. **2.** Identify the dead lock situation and provide appropriate solution so that protection and security of the operating system is also maintained. **3.** Analyse memory management techniques,

	concepts of virtual memory and disk scheduling. **4.** Understand the implementation of file systems and directories along with the interfacing of IO devices with the operating system.

BCOM COMPUTERS (COURSE OUTCOMES)

INFORMATION TECHNOLOGY	At the end of the course, the students is expected to demonstrate the following cognitive abilities (thinking skill) and psychomotor skills. A. Remembers and states in a systematic way (Knowledge*) 1 . Describe the fundamental hardware components that make up a computer's hardware and the role of each of these components 2. understand the difference between an operating system and an application program, and what each is used for in a computer 3. Use technology ethically, safely, securely, and legally 4. Use B. Explains (Understanding*) 5. Apply standard statistical inference procedures to draw conclusions from data 6. Retrieve information and create reports from databases 7. Interpret, produce, and present work-related documents and information effectively and accurately C. Critically examines, using data and figures

	(Analysis and Evaluation**) 8. Analyze compression techniques and file formats to determine effective ways of securing, managing, and transferring data 9. Identify and analyze user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing based systems. 10. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions. 11. Identify and analyze computer hardware, software D. Working in 'Outside Syllabus Area' under a Co-curricular Activity(Creativity) Design, implement, and evaluate a computing-based solution to meet a given set of
E-COMMERCE & WEB DESIGNING	At the end of the course, the students are expected to DEMONSTRATE the following cognitive abilities (thinking skill) and psychomotor skills. A. Remembers and states in a systematic way (Knowledge*) 1. Understand the foundations and importance of E-commerce 2. Define Internet trading relationships including Business to Consumer, Business-toBusiness, Intra-organizational. 3. Describe the infrastructure for E-commerce. 4. Discuss legal issues and privacy in E-Commerce. 5. Understand the principles of creating an effective web page, including an in-depth consideration of information architecture B. Explains (Understanding* 1. Recognize and discuss global E-commerce issues. 2. Learn the

	language of the web: HTML and CSS. C. Critically examines, using data and figures (Analysis and Evaluation**) 1. Analyze the impact of E-commerce on business models and strategy. 2. Assess electronic payment systems 3. Exploring a web development framework as an implementation example and create Dynamically generated web site complete with user accounts, page level security, modular design using css D. Working in 'Outside Syllabus Area' under a Co-curricular Activity (Creativity) Use the Systems Design Approach to implement websites with the following steps: • Define purpose of the site and subsections • Identify the audience • Design and/or collect site content • Design the website theme and navigational structure • Design & develop web pages including: CSS Style Rules, Typography, Hyperlinks, Lists, Tables, Frames, Forms, Images, Behaviors, CSS Layouts E. Build a site based on the design decisions and progressively incorporate tools a
	At the end of the course, the students is expected to DEMONSTRATE the following cognitive abilities (thinking skill) and psychomotor skills. B. Remembers and states in a systematic way (Knowledge*) 12. Develop programming skills 13. Declaration of variables and constants use of operators and expressions 14. learn the syntax and semantics of programming language 15. Be familiar with programming environment of C

PROGRAMMING WITH C & C++	and C++ 16. Ability to work with textual information (characters and strings) & arrays C. Explains (Understanding*) 17. Understanding a functional hierarchical code organization 18. Understanding a concept of object thinking within the framework of functional model 19. Write program on a computer, edit, compile, debug, correct, recompile and run it D. Critically examines, using data and figures (Analysis and Evaluation**) 20. Choose the right data representation formats based on the requirements of the problem 21. Analyze how C++ improves C with object-oriented features 22. Evaluate comparisons and limitations of the various programming constructs and choose correct one for the task in hand. D. Working in 'Outside Syllabus Area' under a Co-curricular Activity(Creativity) Planning of structure and content, writing, updating and modifying computer programs for user solutions E. Exploring C programming and Design C++ classes for code reuse (Practical skills***)
DATA BASE MANAGEMENT SYSTEM	At the end of the course, the students is expected to DEMONSTRATE the following cognitive abilities (thinking skill) and psychomotor skills. A. Remembers and states in a systematic way (Knowledge*) 1. Understand the role of a database management system in an organization. 2. Understand basic database

	concepts, including the structure and operation of the relational data model. 3. Understand and successfully apply logical database design principles, including E-R diagrams and database normalization 4. Understand Functional Dependency and Functional Decomposition 5. Explains (Understanding*) 6. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS. 7. Perform PL/SQL programming using concept of Cursor Management, Error Handling, Packages 8. Critically examines, using data and figures (Analysis and Evaluation**) 9. Apply various Normalization techniques 10. Model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model D. Working in 'Outside Syllabus Area' under a Co-curricular Activity(Creativity) Design and implement a small database project E. Construct simple and moderately advanced database queries using Structured Query
Database Management Systems	**CO-1.**Student knows database

	structure and its design **CO-2**. Students are able to understand Different data models used for database design **CO-3.** Students are able to understand database transactions and data recovery **CO-4.** Students can use DML,DDL,DCL commands to manipulate data in the database
e-Commerce	**CO-1**. Evaluate e-commerce markets and transactions, including supply chains • **CO-2.**Assess the effect of changing technology on traditional business models and strategy **CO-3.**Analyze e-commerce business needs and resources and match to technology considering human factors and budget constraints **CO-4.**Create, modify, enhance and publish a simple e-commerce web site.
Web Technology	**CO-1**. To understand the web architecture and web services. **CO-2**. To practice latest web technologies and tools by conducting experiments. **CO-3**. To design interactive web pages using HTML and Style sheets. **CO-4**. To study the framework and building blocks of .NET Integrated Development Environment.

BSC WEB ENABLED TECHNOLOGY (OUTCOMES)

FUNDAMENTALS OF COMPUTERS WEB &PYTHON	Upon successful completion of the course, a student will be able to: 1. Understand the working of a digital computer. 2. Analyze a given problem and develop an algorithm to solve the problem. 3. Improve upon a solution to a problem. 4. Use the Python language constructs in the right way and Design programs in Python. 5. Acquire skills to implement and test Python programs.
Graphic Designing and Web designing (Illustrator Advanced Photoshop &Wordpress)	Upon successful completion of the course, a student will be able to: 1. Develop skills in digital imaging using Photoshop which is useful for webpage design. 2. Acquire skills in creation of logos and emblems with the help of Illustrator. 3. Understand basic principles of Web designing. 4. Setup a domain and hosting account. 5. Create websites with the help of Word press
OOPís through JAVA	At the end of this course student will: 1. Understand the concept and

	underlying principles of Object-Oriented Programming 2. Understand how object-oriented concepts are incorporated into the Java programming language 3. Develop problem-solving and programming skills using OOP concept 4. Understand the benefits of a well structured program 5. Develop the ability to solve real-world problems through software development in high-level programming language like Java 6. Develop efficient Java applets and applications using OOP concept 7. Become familiar with the fundamentals and acquire programming skills in the Java language.
HTML, CSS & Java Script	Upon successful completion of the course, a student will be able to: 1. Create a static webpage. 2. Acquainted with HTML basic tags, frames, lists, table, etc. 3. Create a webpage using cascading style sheets and HTML. 4. Validate web pages with the help of javascript
PHP & MySQL	After completing this course satisfactorily, a student will be

	able to: 1. Introduction to web development with PHP 2. How to code a PHP application 3. Introduction to relational databases and MySQL 4. How to use PHP with a MySQL database 5. How to use the MVC pattern to organize your code 6. How to test and debug a PHP application 7. How to work with form data 8. How to code control statements 9. How to work with strings and numbers 10. How to work with dates 11. How to create and use arrays 12. How to work with cookies and sessions 13. How to create and use functions 14. How to use regular expressions, handle exceptions, and validate data

BSC WEB ENABLED TECHNOLOGY (OUTCOMES)

Fundamentals of Computer and C-Programming	1. To explore basic knowledge on computers 2. Learn how to solve common types of computing problems. 3. Learn basic constructs of computer programming languages 4. Learn data types and control structures of C 5. Learn to map problems to programming features of C. 6. Learn to write good portable C programs.
Fundamentals of IoT and Applications	1. To study fundamental concepts of IoT 2. To understand roles of sensors in IoT 3. To Learn different protocols used for IoT design 4. To be familiar with data handling and analytics tools in IoT 5. Appreciate the role of big data, cloud computing and data analytics in a typical IoT system.

MATHEMATICS Course-Outcomes	
Paper	After completion of the course students will be able to
DIFFERENTIAL EQUATIONS	• Extract the solution of Differential Equations of the I order and I Degree by variable seperable Homogeneous and Non Homogeneous methods. • Find the solution of DE of the I order and of Degree Higher than the First by using methods solvable for p, x, y and Clairaunt's form. • Compute all the solutions of II and higher order Linear Differential Equations with constant and variable coefficients of Homogeneous and Non Homogeneous. • Compute all the solutions of higher order Linear Differential Equations by using method of Variation of Parameters. • Cauchy Euler Equation.
SOLID GEOMETRY	• Describe various forms of equation of a Plane,Straight Line,Sphere,Cone and Cylinder. • Find the angle between Planes, Bisector planes, Perpendicular distance from apoint to a plane, Image of a line on a plane, intersection of two lines. • Define co planar lines and illustrate. Compute the angle between a Line and a Plane, length of perpendicular from a point to a Line. • Define Skew lines, Calculate the shortest distance between two skew lines.
GROUP THEORY	• Define Group, Subgroup, Centre, Normaliser of a Subgroup. • Prove Legrange's Theorem. • Find Cycles and Transpositions of given Permutations. • Define cyclic groups and prove Cayley's Theorem. • Define Homomorphism, Kernel of a Homomorphism, Isomorphism, and Fundamental theorem of Homomorphism for Groups. • Define Normal Subgroups, Quotient Groups.

REAL ANALYSIS	• Define different types of Sequences. • Discuss the behavior of the Geometric Sequence. • Define Convergent and Divergent of a Sequence and Monotonic Sequence. • Prove Cauchy First Limit Theorem and Second Limit Theorem. • Give examples for Convergence, Divergence and Oscillating Series. • Discuss the behavior of the Geometric Series. • Verify whether the given series is Convergent or Divergent by using different tests. • Define Limit and Continuity of a Function and Uniform Continuity. • Define Derivability of a Function on an interval, at a point. • Prove the Mean Value Theorems- Roles, Legrange and Cauchy. • Define Riemann Integral, Fundamental Theorem of Integral Calculus and Mean Value Theorems.
RING THEORY AND VECTOR CALCULUS	• Define a Ring, Sub ring, Boolean Ring, Zero Divisor of a Ring, Integral Domain, Characteristic of a Ring and Ideal. • Define Homomorphism of a Ring, Image and Kernel and Fundamental theorem of Homomorphism of a Ring. • Find and interpret the Gradient, Curl, Divergent for a Function at a given point. • Interpret Line, Surface and Volume Integrals. • Evaluate Integrals by using Green's,Stoke's and Guass Theorems
LINEAR ALGEBRA	• Define Vector Space, Sub Space, Linear Span and Linear Sum of two Sub Spaces. • Define Linear Combination of Vectors, Linear Independence and Linear Dependence of Vectors. • Define Basis and Dimension of a Vector Space. • Define Inner Product Space, Norm of a Vector, Schwartz, Bessel's and Triangle Inequality Theorems and Parallelogram Law. • Define the Linear Transformations, Rank and Nullity. • Find the Characteristic Equation, Eigen Values and Vectors of a Matrix. • Prove Cayley- Hamilton Theorem. • Solve the System of Simultaneous Linear Equations.
NUMERICAL ANALYSIS	• Define errors, and their types. • Derive general error formula.

	• Solve problems using Bisection method and iteration method. • Solve problems using False position, Newton Raphson, Muller's methods. • Define Errors in polynomial interpolation, Finite difference, forward, backward and central differences. • Detect errors using differences tables. • Solve problems using Newton's formulae for interpolation, Guass central difference, Stirling's central difference, Bessel's formula. • Solve problems using Legrange's formula, divided difference and backward difference, Relation between divided and backward differences,Relation between central and backward differences.
ADVANCED NUMERICAL ANALYSIS	• Define Curve fitting and solve problems using Least Square Curve fitting procedure. • Solve problems using Newton's Forward Difference and Backward Difference formulae. • Derive Guass formula and Stirling formula using Newton Forward and Backward formulae. • Find maxima and minima of differential difference equation. • Solve problems using Trapezoidal rule,Simpson's 1/3, 3/8 rules, Weddel's rule, Euler formula. • Solve problems using Direct methods, Matrix Inversion ,Guassian Elimination, Guass- Jordan,Jacobi's, and Guass Siedal methods. • Find the solution of ordinary differential equationsby Euler, Taylor, Picard's and Runge - Kutta methods.
INTEGRAL TRANSFORMATIONS	• Find solutions of ordinary differential equations, differential equations with constant and variable coefficient. • Find solutions of simultaneous ordinary differential equations and partial differential equations. • Define Laplace and Inverse Laplace Transforms and solve problems using them. • Define Fourier Sine and cosine Transforms, Scale and Shifting properties and solve problems using them. • Define Finite and Infinite Fourier Sine and cosine Transforms, and solve problems using them.

DEPARTMENT OF BIOTECHNOLOGY

Course Outcomes

Semester I –Bio molecules and Bio analytical techniques BT 101	**CO1.** Impart complete knowledge about structure and function of different biomolecules (proteins, lipids, nucleic acids, and carbohydrates) found in living cells. . **CO2.** Impart complete knowledge on classification of biomolecules. **CO3.** Impart knowledge on physical and chemical properties of biomolecules. **CO4.** Bioanalytical tools are cell-based bioassays that give a measure of the effect and presence of known and unknown chemicals in complex environmental samples **CO5.** Course will impart knowledge on the principle, working, maintain and calibrations of bioanalytical tools and techniques for industrial and research purpose. **CO6.** Students will be able to learn underlying principle of techniques such as electrophoresis, microscopy, spectroscopy, centrifugation and chromatography.
Semester II - Microbiology, Cell & Molecular Biology	**CO1.** To acquire skills and competency nmicrobiological laboratory practices applicable to microbiological research or

BT 201	clinical methods, including accurately eporting observations and analysis. CO2. Course will provide practical knowledge about different types of bacteria, virus and fungi found in environment. **CO3.** Course will impart knowledge on isolation and identification techniques. **CO4.** Course will impart knowledge on role of cell organelles, cell division and its regulation. **CO5.** The course particularly aims at understanding structure , synthesis and replication of nucleic acids. **CO6.** Acquire knowledge on enzymology and steps in gene expression and regulation.
Semester III - Immunology & r-DNA technology **BT 301**	Course will provide technical knowledge as o how different diseases are caused and various responses mediated by living cells to combat pathogen attack. Course will provide sound knowledge of how mmune system deals with various pathogens, different processes and cell types nvolved in prevention of disease. Students will understand mechanism of

	different hypersensitivity reactions. Students will become aware about concept and action mechanism of vaccines. Understand the mechanism of action and the use of restriction enzymes in biotechnology esearch and recombinant protein production. Understanding on application of genetic engineering techniques in basic and applied experimental biology and proficiency in designing and conducting experiments nvolving genetic manipulation.
Semester – IV - Plant &Animal Biotechnology **BT 401 (i)**	The course will provide complete exposure as how plant and animal cells are solated, cultured and genetically manipulated n laboratory. The course will provide information hoe cell suspension cultures can be utilized for molecular farming for commercially synthesizing products such as vaccines, hormones, proteins, enzymes, etc.. Understand the mechanism of different gene ransfer methods in plants and animals. Understand the applications of Transgenic plants and animals.
Semester – IV - Environmental & Industrial Biotechnology	ent Biotechnology is to describe existing and emerging technologies that are important in

BT 401 (ii) **CO1.**	he area of environment. Course will impart knowledge on principles and techniques which underline the application of biosciences, address environmental issues including pollution, mineral resource, renewable energy and water recycling. Develop skills associated with screening of ndustrially Important Strains. Understand principles underlying design of Fermentor and Fermentation Process Understand the steps involved in production of various biotechnological products.
Semester – V - Cell biology and genetics (syllabus according to 2018-2019 regulations)	Course will impart knowledge on isolation and identification techniques. Course will impart knowledge on role of cell organelles, cell division and its egulation. Course on molecular Biology & genetics will enhance the knowledge base about functional and structural organization of nucleic acid. Acquire knowledge on different gene mutations and their causative agents Acquire knowledge on Mendelian principles and their applications in biology and different

	epistatic gene interactions.
Semester V - Molecular Biology	The course particularly aims at understanding structure , synthesis and replication of nucleic acids. cquire knowledge on process of translation and translation. Acquire knowledge on enzymology and steps n gene expression and regulation
Semester VI - Computer Science, Biostatistics& Bioinformatics **CO1.**	informatics is an interdisciplinary area that is he interface between the biological and computational sciences. The primary goal of his course is to uncover how various tools and techniques of bioinformatics can be utilized in studies pertaining to macromolecules (DNA, RNA, protein). CO2. After completing this course students will be able to analyze, interpret and study biological data (sequence, structure, etc) stored in various databases available on nternet. CO3.Understand the various Statistical Tools or Analysis of Biological Data.
Semester VI - Microbial Biotechnology (cluster elective)	Develop an understanding of the various aspects of Bioprocess Technology. Develop skills associated with screening of ndustrially Important Strains.

	Understand principles underlying design of Fermentor and Fermentation Process. Course will impart knowledge on principles and techniques which underline the application of biosciences, address environmental issues including pollution, mineral resource, renewable energy and water recycling. Course will have a specific focus on bioremediation and treatment of polluted effluent.
Semester VI - rDNA Technology (cluster elective)	**CO1.** Understand the mechanism of action and the use of restriction enzymes in biotechnology research and recombinant protein production. **CO2.** Explain the steps of a bacterial transformation and various selection processes for identifying transformants **CO3.** Understanding on application of genetic engineering techniques in basic and applied experimental biology and proficiency in designing and conducting experiments involving genetic manipulation.
Semester VI –Plant and Animal Biotechnology (cluster elective)	**CO1.** The course will provide complete exposure as how plant and animal cells are isolated, cultured and genetically manipulated in laboratory. **CO2.** The course will provide information hoe cell suspension cultures can be utilized

	formolecular farming for commercially synthesizing products such as vaccines, hormones, proteins, enzymes, etc.. **CO3.** Understand the mechanism of different gene transfer methods in plants and animals. **CO4.** Understand the applications of Transgenic plants and animals.

DEPARTMENT OF ZOOLOGY

Name of the Programme: B.Z.C (zoology)

SEM-I (Theory

Title of the Paper: Animal diversity-Biology of Non Chordates	
Course Code: 1003ZOO20	
At the completion of this course a student will be able to:	
CO-1	Describe general taxonomic rules on animal classification
CO-2	Classify Protozoa to coelenterata with taxonomic keys.
CO-3	Classify Phylum Platy helminthes to Annelida phylum using examples from parasitic adaptation and vermi composting
CO-4	Describe Phylum Arthropoda to Mollusca using examples and importance of insects and Molluscans
CO-5	Describe Echinodermata to Hemi chordata with suitable examples and larval stages relation to the phylogeny

SEM- I (Practical)

Title of the Paper: Animal diversity - Biology of Non-Chordates
Course Code: 1003ZOO20PE

At the completion of this course a student will be able to:	
CO-1	To understand the importance of preservation of musium specimens
CO-2	To identify animals based on special identifying charectors
CO-3	To understand the different organ systems through demo or virtual dissections
CO-4	To maintain different a net,l labbled record of identified museum specimens

SEM- II (Theory)

Title of the Paper:Animal diversity- Biology of Chordates	
Course Code: 2003ZOO20	
At the completion of this course a student will be able to:	
CO-1	Describe general taxonomic rules on animal classification of Chordates
CO-2	Classify Protochordata to Mammalia with taxonomic keys
CO-3	Understand Mammals with specific structural adaptations
CO-4	Understand the significance of dentition and evolutionary significance
CO-5	Understand the origin and evolutionary relationship of different phyla from Protochordata to Mammalia

SEM-II (Practical)

Title of the Paper: Animal diversity-Biology of Chordates	
Course Code: 2003ZOO20PE	
At the completion of this course a student will be able to:	
CO-1	To understand the taxidermic and other methods of preservation of chordates
CO-2	To identify Chordates based on special identifying charecters
CO-3	To understand internal anatomyvof animals through demo or virtual dissections,thus directing the student for "empathy toward the fellow living beings"
CO-4	To maintain a neat,labelled record of identified museum specimens

SEM-III (Theory)

Title of the Paper: Cell Biology, Genetics, Molecular biology and Evolution	
Course Code: 3003ZOO20	
At the completion of this course a student will be able to:	
CO-1	To understand the basic unit of the living organisms and to differentiate the organisms by their cell structure
CO-2	Describe fine structure a d function of plasma membrane and different cell organelles of eukaryotic cell.
CO-3	To understand history bof origin of branch of genetics, gain knowledge on heridity, interaction of genes, various types of inheritance pattters existing in animals
CO-4	Acquiring in-depth knowledge on various of aspects of genetics involved in sex determination,human karyotyping and mutations of chromosomes resulting in various disorders
CO-5	Understand the central dogma of molecular biology and flow of genetic information from DNA to protiens.

SEM-III (Practical)

Title of the Paper: Cell Biology,Genetics, Molecular biology and Evolution	
Course Code: 3003ZOO20PE	
At the completion of this course a student will be able to:	
CO-1	Acquainting and skill enhancement in the usage of laboratory microscope
CO-2	Hands-on experience of different phases of cell division by experimentation
CO-3	Develop skills on human karyotyping and identification of chromosomal disorders
CO-4	To apply the basic concept of inheritance for applied research
CO-5	To get familiar with phylogeny geological history of origin and evolution of animals

SEM -IV Paper 4 (Theory)

Title of the Paper: Animal Physiology,Cellular Metabolism and Embryology	
Course Code: 4003ZOO20	
At the completion of this course a student will be able to:	
CO-1	Understand the functions of important animal physiology systems including digestion,cardio- respiratory and renal systems.
CO-2	Understand the muscular system and the neuro- endocrine regulation of animal growth, development and metabolism with a special knowledge of hormonal control of human reproduction.
CO-3	Describe the Structure, classification and chemistry of biomolecules and enzymes responsible for sustenance of life in living organisms
CO-4	Develop broad understanding to basic metabolic activities pertaing to the catabolism and anabolism of various biomolecules
CO-5	Describe the key events in early embryonic development starting from the formation of gametes upto gastrulation and formation of primary germ layers.

SEM -IV Paper 4 (Practical)

Title of the Paper:Animal Physiology,Cellular Metabolism and Embryology	
Course Code: 4003ZOO20PE	
At the completion of this course a student will be able to:	
CO-1	Identification of an organ system with histological structure
CO-2	Deducing human health based on the information of composition of blood cells
CO-3	Demonstration of enzymes activity in vitro
CO-4	Identification of various biomolecules of tissues by simple colorimetric methods and also quantitative methods
CO-5	Identification of different stages of earl embryonic development in animals

SEM -IV Paper 5(Theory)

Title of the Paper: Immunology and Animal Biotechnology	
Course Code:4003ZOO20	
At the completion of this course a student will be able to:	
CO-1	To get knowledge of the organs of Immune system,types of immunity,cells and organs of immunity.
CO-2	To describe immunological response as to how it is triggered (antigens) and regulated (antibodies)
CO-3	Understand the applications of Biotechnology in the fields of industry and including animal cell/tissue culture,stem cell technology and genetic engineering.
CO-4	Get familiar with the tools and techniques of animal biotechnology

SEM -IV Paper 5 (Practical)

Title of the Paper: Immunology and Animal Biotechnology	
Course Code:4003ZOO20PE	
At the completion of this course a student will be able to:	
CO-1	Acquainting students with immunological techniques vis-a-vis theory taught in the class room
CO-2	Interconnect the theoretical and practical knowledge of immunity with the outer world for the development of a healthier life.
CO-3	Demonstrate basic laboratory skills necessary for biotechnology research
CO-4	Promoting application of the lab techniques for taking up research in higher studies

SEM -V Paper 6(a) Theory

Title of the Paper: Sustainable Aquaculture Management	
Course Code: 5003ZOO20	
At the completion of this course a student will be able to:	
CO-1	Evaluate the present status of aquaculture at the Global level and National level
CO-2	Classify different types of ponds used in aquaculture

CO-3	Demonstrate induced breeding carps
CO-4	Aquire critical Knowledge on commercial important of shrimps
CO-5	Identify fin and shell fish diseases.

SEM-5 Paper 6(a)

Title of the Paper: Sustainable Aquaculture Management	
Course Code: 5003ZOOPE	
At the completion of this course a student will be able to:	
CO-1	Identify the charecters of fresh water cultivable species
CO-2	Estimate physico chemical charecters and water used for Aquaculture
CO-3	Examine the diseases of fin and shell fish
CO-4	Suggest measures to prevent diseases in aquaculture

SEM-V Paper 7(a) Theory

Title of the Paper:Post harvest technology of Fish and Fisheries	
Course Code: 5003ZOO20	
At the completion of this course a student will be able to:	
CO-1	Identify the type of Preservation methods employed in aquaculture
CO-2	Choose the suitable processing methods in aquaculture
CO-3	Maintain the standard quality control protocols laid down in aqua industry
CO-4	Identify the best food quality assurance system

SEM-V Paper 7(a) Practical

Title of the Paper: Post harvesting of Fish and Fisheries

DEPARTMENT OF ELECTRONICS

Circuit Theory and Electronic Devices	**CO1**: Apply concepts of electric network topology, nodes, branches, loops to solve circuit Problems including the use of computer simulation. **CO2**: Apply time and frequency concepts of analysis. **CO3**: Synthesize the network using passive elements. **CO4**: Know about amplifier circuits, switching circuits and oscillator circuits their design and use in electronics. **CO5**: Design and construction of a power supply.
Digital Electronics	**CO1**: Develop a digital logic and apply it to solve real life problems. **CO2**: Analyze, design and implement combinational logic circuits. **CO3**: Classify different semiconductor memories. **CO4**: Analyze, design and implement sequential logic circuits. **CO5**: Simulate and implement combinational and sequential logic circuits using VHDL
Analog circuits and Communication	**CO1**: Understand the fundamentals and areas of applications for the integrated circuits. **CO2**: Analyze important types of integrated circuits. **CO3**: Demonstrate the ability to design practical circuits that perform the desired operation. **CO4**: Select the appropriate integrated circuit modules to build a given application. **CO5**: Use of different modulation and demodulation techniques used in analog communication. **CO6**: Identify and solve basic communication problems. **CO7**: Analyze transmitters and receiver circuits.

Micro processers systems	**CO1**: The student can gain good knowledge on microprocessor and implement in practical Applications. **CO2**: Design system using memory chips and peripheral chips for 16 bit 8086microprocessor. **CO3**: Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors. **CO4**: Understand multi core processor and its advantages.
Microcontroller and Interfacing	**CO1**: The student can gain good knowledge on microcontrollers and implement in practical Applications. **CO2**: Learn Interfacing of Microcontroller. **CO3**: Get familiar with real time operating system.
Microprocessors (INTEL 8085)	**CO1**: Study architecture of 8085. **CO2**: Recognize PIN configuration of 8085 and its description **CO3**: Observe classification of instructions **CO4**: Illustrate Interfacing of I/O devices **CO5**: Demonstrate Programmable peripheral device (8255)
Electronic Communication systems	**CO1**: The student can gain good knowledge on analog and digital communication. **CO2**: Understand basic elements of a communication system. **CO3**: Conduct analysis of baseband signals in time domain and in frequency domain. **CO4**: Demonstrate understanding of various analog and digital modulation and demodulation techniques. **CO5**: Analyse the performance of modulation and demodulation techniques in various transmission environments.

Electronic Instrumentation	**CO1**: Measurement of R, L, C, Voltage, Current, Power factor, Power, Energy. **CO2**: Ability to measure strain, displacement, Velocity, Angular Velocity, temperature, Pressure, Vacuum, and Flow.
Power Electronics	**CO1**: Explain the characteristics of various power semiconductor devices and analyze the static and dynamic characteristics of SCR's. **CO2**: Design firing circuits for SCR. **CO3**: Explain the operation of rectifiers with different loads. **CO4**: Analyze the operation of different type's choppers.

ECONOMICS

Course - Outcomes

Micro economic Analysis	After completion of this Course the student would able to **CO1:** Analyze the difference between Macro and Micro Economic analysis. **CO2:** Understand Various terms related to the Micro economic analysis with the help of examples of real life. **CO3:** Understand various laws and principles of consumption, production, and income distribution **CO4:** Critically examines using data and Figures **CO5:** Draws critically diagrams and graphs to explain and examine the application of various laws and principles of microeconomic analysis.
Macroeconomic Analysis	After completion of this course the student would be able to CO1: Gain knowledge about various concepts, laws and principles of macroeconomic theory. CO2: Understand the difference between various concepts and components of national income. CO3: Analysis the theories of macroeconomics.

	CO4: Understand consumption and investment function. CO5: Knows the price indexes, inflation and trade cycle.
Development Economics	After completion of this course the student would able to CO1: Gain knowledge about various concept and indicators relating to economic growth and development. CO2: Understand characteristics of developing economies, factors contributing to development model and strategies of growth. CO3: Analysis the theoretical aspects of models. CO4: Gain knowledge about economic model and strategies. CO5: Analysis empirical evidences to support the strategies.
Economic development of India and Andhra Pradesh	After completion of this course the student would be able to CO1: Gain knowledge about leading issues of Indian economic development. CO2: Understand available resources, demographic issues, general problems of poverty and unemployment and relevant policies. CO3: Knows about Indian Tax System, recent changes issues of public expenditure and public debt.

	CO4: Analysis leading issues of current importance relating to Indian and AP economy. CO5: Knows the achievement of Indian economy with reference to the objectives of planning and policy and make critical evaluation.
Statistical Methods for Economics	After Completion of this course the student would be able to CO1: Gain knowledge about statistical methods various formulae used to measure Central Tendency, correlation, regression. CO2: Understand the importance of statistics and its applications. CO3: Analysis and solving given date and information CO4: Interpret data and suggest solution economic problems. CO5: Knows about different types of Bar diagrams, Pie diagrams and it uses in economic analysis.
Contemporary Indian Economy	After Completion of this course the students would be able to. CO1: analyze Demographic Feature of India and AP. CO2: Understand the trends in urbanization. CO3: Know about unemployment and its dimensions.

	CO4: Evaluate land use and cropping pattern in India and AP. CO5: understand social security schemes women empowerment etc.
Public Finance	After Completion of this course the student would be able to CO1: Understand about nature and scope of Public Finance. CO2: Know about Principle of maximum social advantage theory etc. CO3: Gain Knowledge about taxes and its related topics. CO4: Classification of public expenditure and Public debt and Knows about redemption of public debt. CO5: Analyze the central and state budgets and its related topics.

DEPARTMENT OF HISTORY

COURSE OUT COMES

Course 1 - His1101 Ancient India History And Culture Up To 600 A.D	
1	The Learner Knows The Ancient Heritage And Livelihood Of The Indians.
2	The Learner Aware About How Man Is Differs From The Animals.
3	The Learner Under Stands Religious Tolerance Of Muslim Rulers In India
Course 2 - His2101 Early Medieval Indian History And Culture 600ad-1526 A.D	
1	The Learner Evaluates The Caused And Consequences Of Muslim Invasions On India.
2	The Learner Gets Knowledge About Cultural And Patronage Of Of Art And Architecture Of Muslim Rules In India.
3	The Learner Understands Religious Tolerance Of Muslim Rulers In India
Course 3 -His3101 Late Medieval Of Colonial History Of India 1526ad-1857A.D	
1	Learner Aware About The Golden Age Of Mughals.
2	The Learner Analyses The Factors that Lead to British Imperialism In India
3	The Learner Criticizes The Weakness Of Native Indian Rules.
Course 4 - His4101 Social Reform Movement And Freedom Struggle 1820ad-1974 A.D	
1	The Learner Understands The Conditions Of Original Indian Society Pre Veiling At The Time Of Early Vedic Age
2	The Learner Aware About The Beginning Of Freedom Movement
3	The Students Understand The Methods Which Adopted By Indians Against The British
Course 5 - His5101 Early Modern Old History 1453ad-1815 A.D	
1	To Make The Students Under Stand About Various Revolutions Started In That Period Around The World.
2	To Enlighten The Students About Industrial Revolution.
Course -6 - His6101 History And Culture Of Andhra . From Satavahana To 1857 A.D	
1	To Create Awareness Among The Students About Various Dynasties That Ruled Andhra
2	To Make Understand The Students About Qutub Shahis And Asaf Jahis.
3	To Know The Impact Of 1857 Revolt On Andhra

Course 7 - His7101 History Of Modern World 1815to 1945 A.D	
1	The Learner Aware About The Modern World
2	The Learner Knows The Cause And Consequences Of World War.
3	The Students Can Understand The World After Second World War.
Course 8 His8101 History Of Modern Andhra	
1	To Create Awareness Among The Students About Modern Andhra.
2	To Enlighten The Students About The Formation Of Andhra State.
3	To Make Under Stand The Students That How Unified Andhra Was Formed.

VSR GOVERNMENT DEGREE AND PG COLLEGE MOVVA
DEPARTMENT OF CHEMISTRY
COURSE OUTCOMES

SEMESTER – I

Course I (Inorganic &Physical Chemistry) 60 hrs. (4h/w)

Course outcomes:

At the end of the course, the student will be able to;

1. Understand the basic concepts of p-block elements

2. Explain the difference between solid, liquid and gases intermsof intermolecularinteractions.

3. Apply the concepts of gas equations,pHandelectrolyteswhilestudying herchemistrycourses.

LABORATORY COURSE -I **30**hrs (2 h / w)

Practical-I Analysis of SALT MIXTURE

(At the end of Semester-I)

Qualitative inorganic analysis (Minimum of Six mixtures should be analyzed)

50 M

Course outcomes:

At the end of the course, the student will be able to;

1. Understand the basic concepts of qualitative analysis of inorganic mixture

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

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

SEMESTER – II

Course II – (Organic & General Chemistry) 60 hrs (4h/w)

Course outcomes:

At the end of the course, the student will be able to;

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

2. Formulate the mechanism of organic reactions by re calling and correlating the fundamental properties of the reactants involved.

3. Learnandidentifymanyorganicreactionmechanismsincluding free radical Substitution, Electrophilic AdditionandElectrophilicAromaticSubstitution.

4. Correlateanddescribethestereochemicalpropertiesoforganiccompoundsand reactions.

LABORATORY COURSE-II 30hrs (2 h / w)

Practical-II Volumetric Analysis

(At the end of Semester-II)

Course outcomes:

At the end of the course, the student will be able to;

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

2. Understandandexplainthevolumetric analysisbasedonfundamental conceptslearnt in ionic equilibria

3. Learnandidentifythe concepts of a standard solutions, primary and secondary standards

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

SEMESTER – III

Course III (ORGANICCHEMISTRY&SPECTROSCOPY) 60hrs (4 h / w)

Course outcomes:

At the end of the course, the student will be able to;

1. Understand preparation, properties and reactions of haloalkanes, haloarenes and oxygen containing functional groups.

2. Use the synthetic chemistry learn tin this course to do functional group transformations.

3. To propose plausible mechanisms for any relevant reaction

LABORATORY COURSE -III30hrs (2 h / w)

Practical Course-IIIOrganic preparations and IR Spectral Analysis

(At the end of Semester- III)

Course outcomes:

Onthecompletionofthecourse,thestudentwillbe abletodothefollowing:

1. how to use glassware, equipment and chemicals and follow experimental procedures in the laboratory

2. how to calculate limiting reagent, theoretical yield, and percent yield

3. how to engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately

4. how to dispose of chemicals in a safe and responsible manner

5. how to perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration.

6. how to create and carry out work up and separation procedures

7. how to critically evaluate data collected to determine the identity, purity, and percent yield of products and to summarize findings in writing in a clear and concise manner

SEMESTER - IV

Course IV (INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY) 60hrs (4 h / w)

Course outcomes:

At the end of the course, the student will be able to;

1. To learn about the laws of absorption of light energy by molecules and the subsequent photo chemical reactions.

2. To understand the concept to quantum efficiency and mechanisms of photochemical reactions.

LABORATORY COURSE -IV 30hrs(2 h / w)

Practical Course-IV Organic Qualitative analysis 50 M

(At the end of Semester- IV)

Course outcomes:

At the end of the course, the student will be able to;

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

2. Determine melting and boiling points of organic compounds

3. Understand the application of concepts of different organic reactions studied in theory part of organic chemistry

SEMESTER - IV

CourseV(INORGANIC &PHYSICAL CHEMISTRY) 60 hrs (4 h / w)

Course outcomes:

At the end of the course, the student will be able to;

1. Understand concepts of boundary conditions and quantization, probability distribution, most probable values, uncertainty and expectation values

2. Application of quantization to spectroscopy.

3. Various types of spectra and the IR use in structure determination.

SEMESTER - IV

Course V LABORATORY COURSE 30hrs (2 h / w)

Practical-Course -V Conductometric and Potentiometric Titrimetry 50 M

Course outcomes:

At the end of the course, the student will be able to;

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

2. Apply concepts of electrochemistry in experiments

3. Be familiar with electro analytical methods and techniques in analytical chemistry which study an analyte by measuring the potential (volts) and/or current (amperes) in an electrochemical cell containing the analyte

Course6-B: Analytical Methods in Chemistry-1

(Skill Enhancement Course (Elective), Credits: 05)

I. Learning Outcomes:

Students after successful completion of the course will be able to:

1. Identify the importance of solvent extraction and ion exchange method.

2. Acquire knowledge on the basic principles of volumetric analysis and gravimetric analysis.

3. Demonstrate the usage of common laboratory apparatus used in quantitative analysis.

4. Understand the theories of different types of titrations.

5. Gain knowledge on different types of errors and their minimization methods.

Course6-B: Analytical methods in chemistry-1-PRACTICALSYLLABUS

IV. Learning Outcomes:

On successful completion of this practical course, student shall be able to:

1. Estimate iron(II) using standard Potassium dichromate solution

2. Learn the procedure for the estimation of total hardness of water

3. Demonstrate the determination of chloride using Mohr’s method

4. Acquire skills in the operation and calibration of pH meter

5. Perform the strong acid vs strong base titration using pH meter

Course7-B: Analytical Methods in Chemistry-2

(Skill Enhancement Course (Elective), Credits: 05)

Max Marks: 100+50

I. Learning Outcomes:

Students after successful completion of the course will be able to:

1. Identify the importance of chromatography in the separation and identification of compounds in a mixture

2. Acquire a critical knowledge on various chromatographic techniques.

3. Demonstrate skills related to analysis of water using different techniques.

4. Understand the principles of spectrochemistry in the determination of metal ions.

5. Comprehend the applications of atomic spectroscopy.

Course7-B: Analytical Methods in Chemistry-2- PRACTICAL SYLLABUS

V. Learning Outcomes:

On successful completion of this practical course, student shall be able to:

1. Perform the separation of a given dye mixture using TLC

2. Learn the preparation of TLC plates

3. Demonstrate the separation of mixture of amino acids using paper chromatography

4. Acquire skills in using column chromatography for the separation of dye mixture