

# **DEPARTMENT OF BIOTECHNOLOGY**

## **COURSE OUTCOMES (COs)**

### **SEMESTER – I, PAPER – I MICROBIOLOGY AND CELL BIOLOGY**

- CO –I To know about the historical development and about great contributors of Microbiology.
- CO –II Apart from that to learn about several types of microscopes like Compound, Phase contrast, Fluorescent and Electron microscopes.
- CO –III To know about different types of staining techniques ,Bacterial structure, Viral replications , importance of microbial nutrition.
- CO –IV To attain complete knowledge on microbial growth and its control and also about cell biology.

### **SEMESTER – II, PAPER – II**

#### **MACROMOLECULES, ENZYMOLOGY AND BIOENERGETICS**

- CO –I To attain knowledge on the chemical structure and composition of DNA and RNA, types of DNA, DNA sequencing methods. To learn the concept of prokaryotic and eukaryotic genes, c-value and the detailed structure of chromosome.
- CO –II To study about all amino acid structures, its physicochemical properties, primary, secondary, tertiary and quaternary structures of proteins.
- CO –III To know about carbohydrates and their classification, lipids and their structural properties. To gain knowledge on enzymes, its mechanisms and assay of enzymes and also to study Bioenergetics.

### **SEMESTER – III ,PAPER – III BIOPHYSICAL TECHNIQUES**

- CO –I To describe the information about UV and Visible Spectrophotometer- its principle instrumentation and applications.
- CO –II To ascertain details about different types of chromatographic techniques their principles and applications.
- CO –III To perceive the knowledge about electrophoresis and their types and also applications.
- CO –IV To know about Isotopic tracer techniques ,centrifugation - its types principles and applications

#### **SEMESTER – IV ,PAPER – IV IMMUNOLOGY**

- CO –I To acquire awareness on Immune system – types and it's main pathways of complement system.
- CO –II To learn about antibody structure, classes it's diversity, antigens, antigenicity and complement system.
- CO –III To improve knowledge on different types of immunity and Major Histocompatible Complex.
- CO –IV To perceive knowledge on hypersensitivity, it's types ; vaccination , principles and it's types, and also to know about different types of immunological techniques.

#### **SEMESTER – V, PAPER – V MOLECULAR BIOLOGY**

- CO-I To learn about prokaryotic and eukaryotic genome structures and it's details, Watson and Crick model, enzymology of DNA replication, proof of semi conservative replication, rolling circle replication of DNA and also to know differences between pro and eukaryotic DNA replication to understand the transcription mechanism in pro and eukaryotes and enzymes involved in the transcription.
- CO-II To acquire knowledge on genetic code pro and Eukaryotic protein synthesis wobble hypothesis, post translational modification and alo to learn about gene expression and it's regulation.

#### **SEMESTER – V, PAPER – VI RECOMBINANT DNA TECHNOLOGY**

- CO-I To learn about different types of restriction endonucleases enzymes used in molecular cloning and cloning vehicles to attain knowledge on ligation of DNA linkers usage , screening methods and also construction of c DNA libraries to study about PCR and different types of blotting techniques.
- CO-II To know about methods of gene transfer with reference from *Agrobacterium tumifacians* and also the applications of rDNA technology in agriculture ,medicine and DNA fingerprinting in plant transformation.

## **SEMESTER –VI, PAPER – VI PLANT AND ANIMAL BIOTECHNOLOGY**

CO-I To pursue the knowledge on histological perspectives of plant tissue culture ,basic requirements for tissue culture laboratory, aseptic techniques and also about different types of cultures.

CO-II To learn about applications of plant tissue culture, cryopreservation.

CO-III To attain knowledge on animal cell and tissue culture, MTT based assay,characterstics of cells in culture and cell lines, maintains of cell lines subculture and cryopreservation to acquire the knowledge of rDNA products like recombinant vaccines,transgenic animals,stemcells ,gene therapy and also about Intellectual Property Rights.

**BOTANY**  
**COURSE OUT COMES**

**PAPER- I**

**Microbial Diversity, Algae And Fungi**

- Co1 Explain the Origin of life theories & Discovery of microorganisms With Special types of bacteria
- Co2 Describe the structure, Replication diseases caused & control measures of Viruses
- Co3 Understand the Cell structure ,Nutrition ,reproduction & Economic importance of Bacteria
- Co4 Discuss about Thallus organization ,Reproduction & Economic importance of different types of Algae
- Co5 Describe the types of non chlorophyllus thallophyte of Fungi including their economic importance

**PAPER-II**

**Diversity Of Archegoniate And Plant Anatomy**

- Co1 Discuss about Bryophytes in which Evolution of sporophyte Thallus to leaf structures
- Co2 Describe the 1st true land plants with vascular systems of pteridophytes
- Co3 Describe the naked seed producing plants like Pinus & Gnetum (Gymnosperms).
- Co4 Explain the Tissues & Tissue systems in histological organization
- Co5 Discuss the Anomalous secondary growth in different plants & some local timber yielding plants

**PAPER-III**

**Plant Taxonomy And Embryology**

- Co1 Explain the general introduction of plant taxonomy , nomenclature rules with taxonomic resources
- Co2 Discuss about types of classification , Bentham Hookers, Engler prantles & phylogeny origin & evolution of Angiosperms
- Co3 To study the detailed information on plant taxonomy of Polypetalous
- Co4 Understand the taxonomic families belongs to Gamopetalae
- Co5 Explain the reproduction in plants , development of male & female gametes , zygote formation , embryo development & endosperm role in embryo development

**PAPER-IV**

**Plant Physiology And Metabolism**

- Co1 Explain the importance & properties of water in relation to plant physiological activities
- Co2 Discuss about role of mineral nutrients, Nitrogen metabolism & Enzymes activity in plants
- Co3 Describe the photosynthetic pathways & Translocation of organic solutes in plants

- Co4 Understand the respiration cycles through oxidative phosphorylation & lipid metabolism
- Co5 Explain the growth in plants, role of phytohormones, vernalization & photoperiodism.

#### **PAPER-V**

##### **Cell Biology, Genetics & Plant Breeding**

- Co1 Understand the nature, structure of cell and their organelles', chromosomal organization & special type of chromosomes.
- Co2 Discuss about DNA as a genetic material, structure of DNA & RNA, cell divisions with significance.
- Co3 Explain the Mendel's laws of inheritance an over view of linkage & crossing over
- Co4 Explain the process of plant breeding methods to crop improvement
- Co5 Discuss about Biotechnological aspects of plant breeding in crop improvement

#### **PAPER-VI**

##### **-Plant Ecology And Phytogeography**

- Co1 Discuss about Ecological factors & interaction between plants and animals
- Co2 Understand the productivity of an ecosystem ,energy transformation in food chain & food webs, recycling of elements in atmosphere
- Co3 Understand the population & community ecology through ecological succession
- Co4 Explain the phytogeography, distributional regions of India & World
- Co5 Describe the biodiversity hot spots & seed bank resources in India, levels, loss & conservation of Biodiversity

#### **PAPER-VII**

##### **Nursery Gardening And Floriculture**

- Co1 Infrastructure ,seasonal activities & management of a good nursery
- Co2 Garden Design , home gardening , garden operations, landscaping & computer applications in landscaping, some famous gardens in India
- Co3 Propagation of plants through vegetatively and also using horticulture methods
- Co4 Knowledge ,techniques to production of ornamental plants & Bonsai designing
- Co5 Knowledge on Environmental awareness & cultivation methods to improve the production of commercial floriculture to get self employment

# Chemistry

## Course Outcomes (U.G)

### Semester-I -Paper-I Inorganic and Organic Chemistry

**CO-I** To make student understand the modern periodic table which stand the backbone in understanding Chemistry and the periodic properties like Atomic and Ionic size Ionization Energy Electron Affinity Electro negativity and making student understand the P-Block elements of Group 13&14 Elements in a periodic table.

**CO-II** They know the Classification ,Nomenclature of Organo metallic compounds.

**CO-III** Students become eligible to study the subject initially by understanding the basic things for chemical reactions i.e. Substrate and Reagents Types of reagents Electrophilic and Nucleophilic Homolytic and heterolytic fission & Inductive effect etc.

**CO-IV** Many of the daily used materials are organic compounds and majority of them are hydrocarbons therefore this topic makes the concept regarding their formation.

**CO-V** They know about the Basic of the alkenes and alkynes and describe the structure of Benzene with respect to the chemical point of view.

### Semester-II- Paper-II Physical and General chemistry

**CO-I** Physical chemistry is the branch of chemistry which supports in different ways to understand the subject theoretically which needs the help of certain tools and the mathematical tools are important amongst it thus understanding the mathematical ideas the subject can be better enriched.

**CO-II** The research and the development has evolved to the level high and as a result of that the human life standard has thus enhanced day by day medicinal, infrastructural home utilities etc facilities like electronic equipments.

**CO-III** The drugs may used any of the states of the matter like solid, liquid, gaseous state.

**CO-IV** In majority of the daily routine thing used for its surface utilization and therefore understanding the surface phenomenon.

**CO-V** The students will gain Knowledge about Different types of Hybridisation.and also the concept of Hydrogen bonding and describe the MOT Theory of Homo and Hetero Atomic molecules. the importance of optical isomerism and understand the terms of Enantiomers, Diastereomers and Meso compounds.

### **Semester-III- Paper-III Inorganic and Organic Chemistry**

**CO-I** The students will be an Understand the trends in atomic and physical properties of d-block elements .

**CO-II** The students will gain Knowledge about Conductors. Semiconductors and Insulators used in daily life.

**CO-III** The students will an Understand the shapes and structures of metal carbonyls.

**CO-IV**The students will be an Understand the distinguish aliphatic and aromatic halogenated organic compounds and they know the preparation methods for the halogenated organic compounds.The students will Understand the interpret reactivity of aldehydes and ketones.

**CO-V** The students write different preparation methods for carboxylic acids and their derivatives.and also understand the design reactions of carboxylic acids and their derivatives of active methylene compounds.

### **Semester-IV- Paper-IV Spectroscopy & Physical Chemistry**

**CO-I** The students will gain an understand the Spectroscopy and how to analyzed the unknown organic compounds by using instrumentation of spectrophotometers of IR spectroscopy Electronic spectroscopy and proton magnetic resonance spectroscopy.

**CO-II** The fundamentals of electronic structure and bonding in conjugated and aromatic systems by using Electronic spectroscopy

**CO-III** Students will be provided with an introduction to the fundamentals of electrochemistry and solution properties. And understand how simple ions added to aqueous solution affect the structure of water.

**CO-IV** The students Understand why a solution conducts electricity and how it can be measured.and the relationship between the cell potential, and also how to measure a standard electrode potential using a standard reference electrode.

**CO-V** Defines the importance of phase diagrams in the field of material science. And define the importance of basic definitions Phase,Equilibrium,Component,Degree of freedom and phase rule concept.

## **Semester-V - Paper-V- Inorganic,Physical and Organic Chemistry**

- CO-I** The students will gain an understand how to classify of coordination compounds,Valence bond theory,Hybridisation.
- CO-II** Describe the electronic selction rules and correlate the intensity and wavelength of Coordination geometry.
- CO-III** The students will gain an understand the classification and nomenclature &named reactions of nitro hydrocarbons.
- CO-IV** They know the nomenclature,classification of primary,secondry,tertiary &quaternary amines and its synthesis and applications of nitrogen compounds.
- CO-V** Students will gain an understanding of the first law of Thermodynamics and how to express its mathematical application and calculate energy.

## **Paper-VI- Inorganic,Physical and Organic Chemistry**

**CO I :** The students able to describe bonding models that can be applied to a consideration of the properties of transition metal complex. The students familiar about the inorganic halogen compounds, coordination compounds and transition elements.

**CO II :** They know the biological significance of elements. And also gain the knowledge about the structure and functions of Hemoglobin, Chlorophyll.

**CO III :** The students understanding of heterocyclic chemistry which includes various methods for ring synthesis and application of those methods for the preparation of specific groups of heterocyclic systems.

**CO IV :** They find the carbohydrates in our food, and understand the structure of glucose and fructose.

**CO V :** The students define what are amino acids, and which elements present in our body and also the synthesis and applications of amino acids.

## **Semester-VI – Elective Paper-VII Inorganic,Physical and Organic Chemistry**

**CO-I** The course aims to familiarize students with the principles of analytical chemistry and Basic analytical techniques including volumetric analysis.

**CO-II** The students should be able to make the solutions of various molar concentrations.

**CO-III** The students know the how to separate impurities in solvents by solvent extraction.

**CO-IV** The students know the how to separate a components in mixture in industrials.

**CO-V** The students also understand the different chromatographic methods in practical purposes.

### **Cluster Paper-VIII-(A-1): Polymer Chemistry**

**CO-I** The students will gain knowledge about, how to estimate the number- and weight-average molecular masses of polymer samples given the degree of polymerization and mass fraction of chains present.

**CO-II** The students an understanding of Converting monomer to long chain polymer and understanding of polymerization processes.

**CO-III** The students identify the repeat units of particular polymers and specify the isomeric structures which can exist for those repeat units

**CO-IV** They describe the role of rubber-toughening in improving the mechanical properties of polymers.

**CO-V** The students know the how to manufacture of plastics in Industrial level.

### **Cluster Paper-VIII-(A-2): Instrumental methods of analysis**

**CO-I** The fundamentals of electronic structure and bonding in conjugated and aromatic systems by using Electronic spectroscopy.

**CO-II** The students how to detect a signals and they know the advantages of FTIR.

**CO-III** They know the single and double beam spectrophotometers and Fluorescence.

**CO-IV** They know the how to handling of Gas and liquid chromatography by using different samples in industrial purpose.

**CO-V** The students an understanding of separation of ions by using mass, charge ratio.

### **Cluster Paper-VIII-(A-3):**

#### **Analysis of Drugs, Foods, Dairy products and Bio chemical analysis**

**CO-I** The students know the information about how drugs perform in daily clinical practice.

**CO-II** They know the Molecular structure of Paracetmol and Aspirin.

**CO-III** They Know the different anti histamine drugs like Allegra, zyrte.

**CO-IV** The students know about analysis of milk, and identify the fat, acidity present in Milk products.

**CO-V** They know about the how to estimate blood composition in clinical analysis.

#### SEMESTER -I

- COURSE CODE: CHE -10301
- COURSE TITLE: CHE -101- IN ORGANIC CHEMISTRY

CO1: Explain the basics of crystal field theory, CFSE and its calculations splitting of d-orbital, structures (trigonal, square planar, pyramidal, pentagonal), its applications and MOT of coordinate bond, M.O diagram

CO2: Explain the general characteristics of the Non-Transition elements, special features of individual elements Synthesis, properties & structure of some Non-Transition elements

CO3: learn to Reactivity of metal complexes, inert & labile complexes, kinetics & mechanism of substitution reactions, acid & base hydrolysis reaction

CO4: Understand the preparation, properties, structures, VBT, MOT, EAN of the metal carbonyls and metal nitrosyls

- COURSE CODE: CHE -10302
- COURSE TITLE: CHE- 102 - ORGANIC CHEMISTRY

CO1: Explain the aromatic, non aromatic, benzenoid and non benzenoid compounds it follows the Huckel rule, structure and synthesis of some aromatic compounds

CO2: learn to the aliphatic and aromatic substitution reactions classification of substitution reactions NGP, Bandings, reactivity of substrate and examples

CO3: Explain the representation of organic molecules and Optical isomerism: Molecular Symmetry and Chirality, classification-configuration of cis and trans, R-S isomers some examples

CO4: learn to the Type of reactions and mechanisms and some examples, thermodynamic and kinetic requirements and controls, potential energy diagrams (allyl and arynes, free radicals)

- COURSE CODE: CHE- 10303
- COURSE TITLE: CHE -103 -PHYSICAL CHEMISTRY

CO1: Explain the Quantum mechanical results of operator algebra, momentum and energy. the Schrödinger's equation, particle in a box and some modals, And approximate methods (first order, non degenerate)

CO2: learn to the chemical dynamics of rate laws, collision theory, Lindeman-Hinshelwood (RRKM) theory and applied photochemical reactions (H, Br, HCl), Autocatalysis-H, O reactions

CO3: Analyze the thermodynamic derivation of phase rule, solid-liquid, thermal analysis and applications, Two component system

CO4: Analyzed The Electro Chemistry Debye Huckel- Onsager equation, limitations examples activity and activity coefficients EMF method their limitations and reversible electro chemical cells (liquid junction potential), electro catalysis

➤ COURSE CODE: CHE -10304

- COURSE TITLE: CHE -104 - SPECTROPHOTOMETER GROUP THEORY AND ANALYTICAL METHODS

CO1: Explain the basic principles of spectroscopy and electromagnetic spectrum, width of spectral lines. And UV & visible spectroscopy (Beers-Lambert's law) some examples are Cr & Mg in mixtures.

CO2: To analyze symmetry and group theory, sub groups and classification point symmetry group, symbols ( $C_n, C_{nv}, D_{nh}$ ) etc.

CO3: To analyze analytical methods and types of errors, significant figures their examples and calibration of weights, glass wear.

CO4: Explain the basic principles of thermal methods and radio analytical methods their examples.

## COURSE OUTCOMES

### SEM-II

- COURSE CODE: CHE 20301
- COURSE TITLE: CHE 201 IN ORGANIC CHEMISTRY

CO1: Explain transition metal  $\pi$ -complexes understand organic molecules their preparation, properties, structures and reactivity.

CO2: To learn electronic spectra of complexes Frank-condon principle - Russell-Saunders coupling - spectroscopic term symbols - selection rules - break down of selection rules - Orgel Diagrams for  $d^1$  to  $d^9$  configurations.

CO3: To explain magnetic properties of transition metal complexes and calculation of magnetic moment from magnetic susceptibility of examples Ti (III), V (III),  $VO^{2+}$ , Cr (III), Mn (II), Fe (III), Co(II), Ni (II) and Cu (II).

CO4: To analyze catalysis reactions, classification, redox reactions other types of catalyzed reactions in their examples.

- COURSE CODE: CHE 20302
- COURSE TITLE: CHE 202 ORGANIC CHEMISTRY

CO1: Explain the elimination reactions and etherification and their types, factors, molecular rearrangement some reactions.

CO2: Explain the stereochemistry of geometric isomerism, classification and conformational analysis and their reactivity of cyclic & acyclic molecules examples of some isomerism.

CO3: Explain the nomenclature of heterocyclic compounds (Hantzsch-Widman) three & four member cycles their synthesis and chemical properties.

CO4: Explain the definition, general methods of isolation, isoprenoid rule, classification and synthesis of terpenoids.

- COURSE CODE: CHE 20303
- COURSE TITLE: CHE 203 PHYSICAL CHEMISTRY

CO1: Explain the Quantum Chemistry Angular momentum - Generalised Angular momentum, Electronic structure of Atoms and molecular orbital theory of Hückel

file their applications and examples.

CO2: To learn surface chemistry, vapour process, Gibbs adsorption isotherm BET equation and micelles their classification CMC reactions.

CO3: Explain the Classical Thermodynamics, Statistical Thermodynamics, Derivation of Gibbs- Durham's equation, calculation of thermodynamic properties in terms of partition functions – Heat capacity, chemical equilibrium and equilibrium constant in terms of partition functions .

CO4: Explain the Reversibility and irreversibility, Dissolution and deposition, voltage, charge transfer, polarography reactions in electro chemistry.

➤ COURSE CODE: CHE 20304

- COURSE TITLE: CHE 204 –BIO INORGANIC, BIO ORGANIC BIO  
PHYSICAL & CHEMOTHERAPY

CO1: Explain the bio inorganic chemistry, hydrolytic metallo enzymes, importance of metal in biology and metal complexes.

CO2: To learn carbohydrates lipids and fatty acids their structures and biological importance of bio organic chemistry.

CO3: To learn bio physical chemistry, polymers, enzymes(DNA & RNA) Structures and functions.

CO4: To Explain chemotherapy, anti materials and anti biotics, their structures and synthesis structure activity relationship.

## COURSE OUTCOMES

### SEM-III

- COURSE CODE: CHE 30301
- COURSE TITLE: CHE 301 - ORGANIC CHEMISTRY-I

CO1: To Learn Addition Reaction C-C, C=C, C=O, C=N reactions and some named reactions, rearrangements, examples

CO2: learn to the reagents in uses in organic synthesis reactions examples (AlCl<sub>3</sub>, BF<sub>3</sub>, N-Bs, DDQ-etc)

CO3: Explain the some organo metallic reagents their uses in organic reactions (Zn, Co, Me, Rh, Pd, Ni)

CO4: Explain the Topicity, Prochirality, Pro stereoisomerism-Substrate Selectivity, Diastereo selectivity, classify cation of Asymmetric Synthesis ,some examples

- COURSE CODE: CHE 30302
- COURSE TITLE: CHE 302 - ORGANIC CHEMISTRY-II

CO1: To Learn Replacement and Hantzsch-Widman nomenclature of five membered, six membered and fused heterocycles and their synthesis

CO2: learn to the Benzofused Five and Six Membered Heterocyclic Compounds, their synthesis and functions

CO3: Explain The Polymer Reactions, Stereo specific Polymers, Preparation of Polymers based on different types of polymers and synthesis

CO4: Analyzed the oxidation and reduction reaction ,difference between the oxidation and reduction ,some examples

COURSE CODE: CHE 30303

COURSE TITLE: CHE 303 –ORGANIC SPECTROSCOPY AND ITS APPLICATIONS

CO1: To define the UV spectroscopy ,ORD and Circular dichrosim principle , some examples

CO2: To analyzed the IR spectroscopy ,FT-IR spectroscopy, values and applied some

carbonyl compounds

CO3: To explain the NMR spectroscopy, C13 NMR spectroscopy and their applications classification of Copings (ABX, AMX, ABC, A2B2 etc), COSY, NOESY, DEPT, HSQC, HMBC.

CO4: To analyzed the Mass spectroscopy values, types. Molecular ion pike, Ei, CI, FD and FAB, examples of mass spectral fragmentation of organic compounds with respect to their structure determination.

➤ COURSE CODE: CHE 30304

• COURSE TITLE: CHE 304 – GENERAL CHEMISTRY

CO1: To analyzed the structure, bio synthesis, biological importance, classification of Vitamins And Prostaglandins

CO2: To analyzed the structure, bio synthesis, biological importance, classification of enzymes as a tool for drug development (aspirin).

CO3: Knowldged for drug discovery and principle of drug desining, classification of drug some examples their biological importance.

CO4: Knowldged for different types of chromatography techniques used for modern separation methods.

## COURSE OUTCOMES

### SEM-IV

- COURSE CODE: CHE 40301
- COURSE TITLE: CHE 401 - ORGANIC SYNTHESIS-I

CO1: Learn to the organometallic reagent used for organic reactions(B,S,Si,Pa).

CO2: Knowledge for some rearrangements used in organic reactions, classification of rearrangements (C,N,O) and aromatic rearrangements.

CO3: Knowledge for different types of reactions involved in organic synthesis, used for PTC, microwave, enamine, ionic liquid .

CO4: Learn to the molecular orbital symmetry used for organic molecules, electrocyclic reactions, classification,  $4n+2$  rule .

- COURSE CODE: CHE 40302
- COURSE TITLE: CHE 402 - ORGANIC SYNTHESIS-II

CO1: : Knowledge for different types of organic reactions Disconnection Approach, Classification of organic reactions-C,C=C,C-X, Two C=X some examples.

CO2: Knowledge for different types of organic reactions, protecting group, one group two group and some examples.

CO3: Learn to the differences types of photo chemical reaction used in examples and cycle, acyclic compounds.

CO4: Learn to the molecular orbital symmetry used for organic molecules cyclo addition reactions some examples and sigma tropic rearrangements.

COURSE CODE: CHE 40303

COURSE TITLE: CHE 403 –CHEMISTRY OF NATURAL PRODUCTS

CO1: Knowledge for basics skeleton, nomenclature and bio synthesis of steroids and hormones.

CO2: Analyzed for accuracy, isolation, structure elucidation and physico logical action, classification and biosynthesis of alkaloids.

CO3: Knowledge for synthesis, properties, structure and metabolism of proteins and

peptides.

CO4: Learn to accuracy, isolation, structure elucidation and synthesis biological importance of flavanoids & isoflavanoids .

➤ COURSE CODE: CHE 40304

• COURSE TITLE: CHE 404 – GREEN CHEMISTRY

CO1: Knowledge for principle, atom economy and scope of green chemistry used in organic reactions.

CO2: Knowledge for synthesis of some examples used in multistep synthesis.

CO3: Understand the classification, characterization and applications of nonmaterial's.

CO4: Explain the structure synthesis and conformation of nucleic acid nucleotide.

**DEPARTMENT OF COMMERCE**

**COURSE OUTCOMES**

**SEMESTER-I:**

**DSC 1A-FUNDAMENTALS OF ACCOUNTING:**

**CO1:** Enhanced the Knowledge and capacity to understand the Basics of Accounting

**CO2:** Improved the Capacity to prepare subsidiary Books, Trial Balance and how to rectify the Errors.

**CO3:** Trained students to Acquire knowledge to solve the problems faced in Partnership business

**CO4:** Enhance the Knowledge to understand the Favorable and unfavorable Balance for bank reconciliation statement

**CO5:** Knowledge given to Use of basic Accounting data from an organization to Prepare Annual Financial statements like Trading, Profit& Loss Account and Balance Sheet.

**DSC 2A-BUSINESS ORGANIZATION**

**CO1:** Trained to understand the basics of Business Organization and Knowledge given to see the business matters not only in the few of Economics, but also in Society point of view.

**CO2:** Comprehensive knowledge given to a student to turn as entrepreneur

**CO3:** Develop interest to understand different forms of business organization.

**CO4:** Create interest to know about different Companies like Public &Private in analytical way.

**CO5:** Knowledge given to Prepare documents to incorporate a Company

**DSC 3A-BUSINESS ECONOMICS**

**CO1:** Enhanced interest to know about Scope of Business Economics in Micro and Macro point of view.

**CO2:** Created Interest to know about the Demand Analysis

**CO3:** Enhanced knowledge given to understand Elasticity of Demand

**CO4:** Enhanced Knowledge given to understand the Classification of Cost and Revenue

**CO5:** Practical Knowledge given to Understand about BEP and Implementation to gain more Profits as an entrepreneur

## **SEMESTER-II:**

### **DSC- 1B FUNDAMENTALS OF ACCOUNTING-II**

**CO1:** Student trained to know the different methods of Depreciation and its effect in calculation of Profit& Loss in Final Accounts

**CO2:** Enable Students to know about the Provisions and Reserves and gained knowledge to prepare the aforesaid Accounts

**CO3:** Gained Knowledge about bills and Procedure to Write entries and maintain Accounts in the Books of Drawer and Drawee

**CO4:** Capacity to maintain Consignment Accounts, Consignment is giving way to expand Business.

**CO5:** Gained knowledge about joint venture and in Preparation of Joint Venture Accounts which is useful to Promote Project Culture in business.

### **DSC 2B-BUSINESS ENVIRONMENT**

**CO1:** Gained knowledge about business Environment which is under stand to Businessman.

**CO2:** Advantage taken to acquaint with economic factors influencing, balanced regional development.

**CO3:** Attained knowledge about five years Planning System which besides the Economic Growth and GNP in India

**CO4:** Advanced Information relating to Economic Policies and Union Budget known by the Students.

**CO5:** Process in Political and Legal Environment in Business and Social justice acquainted.

### **DSC 3B-BUSINESS ECONOMICS-II**

**CO1:** Achieved Knowledge about Production and Cost, which is essential to become an Entrepreneur.

**CO2:** Acquainted with Marketing Structures and Policies of Price Determination.

**CO3:** Benefited with the Knowledge of Marginal Productivity and Utility of Distribution

**CO4:** Attained Knowledge about National Income and Economic System.

**CO5:** Gained Comprehension Knowledge about Structural Reforms

**SEMESTER – III:**

**DSC-1C CORPORATE ACCOUNTING**

**CO1:** Gained basic knowledge of accounting for share capital

**CO2:** Find out issue and redemption of debenture, accounting treatment for convertible and non-convertible debentures and Employee Stock option

**CO3:** Perceived the need of Valuation of Good will and methods for Valuation of Goodwill

**CO4:** Being expertise on valuation of shares

**CO5:** Be aware in presentation and Preparation of company final accounts

**DSC-2C BUSINESS STATISTICS**

**CO1:** Gained knowledge of Statistics in Collection of Data, Graphic Presentation of Data using Computers to become Statistician.

**CO2:** Experienced Practical Knowledge in Implementation of Measures of Central Tendency

**CO3:** Gained Perception on the utilization of Dispersion and Skewness

**CO4:** Acquired Comprehensive Knowledge on Measures of Relation and Regression Analysis

**CO5:** Attained Knowledge on analysis of Time series and Index numbers

**DSC-3: BANKING THEORY & PRACTICE**

**CO1:** Perceived Knowledge on Banking, Commercial Banking Vs Central Banking

**CO2:** Made them a Perfect Banker with Explanation of Banking Systems In India and their policies

**CO3:** Acquainted with Banking Developments like NABARD, EXIM, SIDBI, Etc...

**CO4:** Realized the Relationship between Banker and Customer and importance of KYC Norms

**CO5:** Learned about rights and Powers of Collecting and Paying Banker

**SEMESTER – IV :**

**DSC 1D-ACCOUNTING FOR SERVICE ORGANIZATIONS**

**CO1:** Gained knowledge about the Concept, types of service organizations – Sec(8) and other provisions of companies Act, 2013

**CO2:** Understood accounts of electricity supply companies and double Accounting system-Revenue, Net Revenue, Capital Accounts, General Balance Sheet

**CO3:** Acquired with the Knowledge of Bank accounts as per Banking Regulation Act, 1969.

**CO4:** Earned Knowledge on life insurance companies act 1956 and prepare final accounts of life insurance companies

**CO5:** Understood about General Insurance companies as per General Insurance Act 1972 and claims for loss of stock

## **DSC2D-BUSINESS LAWS**

**CO1:** Acquainted with meaning and essential elements of Valid Contract Act, Indian Contract Act-1872

**CO2:** Gained Knowledge about the Valid offer, acceptance and Consideration

**CO3:** Understood Capacity of Parties and Contingent Contracts.

**CO4:** Known about the Sale of Goods Act-1930

**CO5:** Got the Knowledge about the Cyber Laws and Digital Signatures

## **DSC3D-INCOME TAX**

**CO1:** Made the students to learn the basics and concepts of Income, Person, Assesse, Assessment Year

**CO2:** Understood the Income from Salary, Deductions U/S 80 C

**CO3:** Learnt the Income from House Property

**CO4:** Known the Income from Capital Gains and other sources of Income

**CO5:** Perceived the total Income of an Individual

## **FOUNDATION COURSE – ENTREPRENEURSHIP**

**CO1:** Experienced the basic knowledge of Entrepreneurship

**CO2:** Explained the Idea Generation and Opportunity Assessment.

**CO3:** Acquired the Knowledge of project formulation and Appraisal and analysis of financial market

**CO4:** Understood the Central and State level Institutions supporting to Small Scale Industries

**CO5:** Known about the Government Policies and taxation Benefits

## **SEMESTER –V :**

### **DSC3E5.1 BUSINESS LEADERSHIP**

**CO1:** Learnt topics of Leadership traits, skills and styles & qualities of good leader.

**CO2:** Understood the decision making and leadership

**CO3:** Known S about the Differences between Leadership and Management and Likert's Management System

**CO4:** Gained the Successful Leadership and Effective Leadership

**CO5:** Understood the Special Topics Related to Inspirational Leaders

### **DSC 1E 5.2 COST ACCOUNTING**

**CO1:** Acquired with the Differences between financial accounting, cost accounting and Management accounting

**CO2:** Understood the Elements of costs, and Methods of LIFO, FIFO

**CO3:** Known the Methods of Control of labour Cost and incentive Plans

**CO4:** Acquired the Knowledge about Methods of Costing

**CO5:** Known about Costing Techniques i.e Break Even Analysis

## **DSC 2E 5.3 GOODS & SERVICE TAX FUNDAMENTALS**

**CO1:** Perceived the Overview of GST Concepts, Tax Reforms and constitutional Amendments

**CO2:** Known the Principles and models of GST

**CO3:** Understood various Taxes and duties with Illustrations

**CO4:** Acquainted with the inter-state goods and services Tax

**CO5:** understood time of supply of goods and services Value of Supply and Input Tax Credit

## **DSC 2E 5.4 ADVANCED ACCOUNTING**

**CO1:** Gained Knowledge on how to Prepare Accounts in Self Balancing System

**CO2:** Acquainted the single entry system

**CO3:** Under stood The Concept of Royalty, Minimum Rent ,Short Workings

**CO4:** Known about the partnership Accounts

**CO5:** Experienced with liquidation accounts

## **SEMESTER – VI :**

### **DSC3G6.4 MANAGEMENT ACCOUNTING**

**CO1:** Learnt the Management Accounting interface with Financial Accounting and cost Accounting

**CO2:** Understood the Ratio Analysis, and its Classification

**CO3:** Acquainted with the Concept Fund, Preparation of Funds flow Statement

**CO4:** gained Knowledge to prepare and utilize the Cash flow Statements

**CO5:** Attained Knowledge on Break Even Analysis and decision making

### **6.1 EVENT MANAGEMENT**

**CO1:** Learnt the Meaning of Event management, characteristics of events, Principles of Event Management

**CO2:** Understood the Event Concepts, Corporate Events and customer Needs

**CO3:** Known about Trade Fairs and Marketing Mix of events

**CO4:** Gained Knowledge on Out door Events

**CO5:** Attained Knowledge on Celebrity Events

### **DSC3E5.1 AUDITING**

**CO1:** Understood the Meaning and objectives of Auditing and Auditing Vs Accounting

**CO2:** Known About the Types of Audits

**CO3:** Learnt the planning of Audit and Steps to be taken for the Commencement of a new Audit

**CO4:** Gained Knowledge on Vouching and Investigation.

**CO5:** Understood About the Company Audit and Auditors Report.

### **Cluster Elective-5A BANKING AND FINANCIAL SERVICES**

**CO1:** Learnt the topics of financial Services and fund based, Fee based Activities

- CO2:** Understood the Merchant Banking Services
- CO3:** Known the difference between Leasing and Hire
- CO4:** Gained Knowledge on Concept of Credit Rating and credit Rating Agencies
- CO5:** Understood the other Financial Services, Central Depository Systems

#### **DSC H 6.6 MARKETING OF FINANCIAL SERVICES**

- CO1:** Known about the differences between Goods and Services
- CO2:** Understood about the Constructing Services Environment
- CO3:** Gained Knowledge on Pricing and Promotion Strategies
- CO4:** Understood about distributing Services
- CO5:** Acquainted with the Retail Financial Services

#### **DSC 1 G 6.2 GOOD& SERVICE TAX AND CUSTOMS ACT**

- CO1:** Known about the Registration and Filling Under GST
- CO2:** Understood Administration Under GST
- CO3:** Gained Knowledge on Assessment under GST
- CO4:** Perceived Knowledge on the Levy and exemption of Tax
- CO5:** Acquainted with the Customs Act, Types and Valuation of Custom Duties

## **B.COM (GENERAL) PROGRAMME OUT COMES**

**PO1:** B.Com General Programme helps to gain Fundamental Knowledge about Commerce and Finance

**PO2:** It focused on different Specialization in the Commerce and Finance which would trained the Students to meet day to day challenges in the business field

**PO3:** It Provides Knowledge to learn number of value based and job oriented Course relating to Commerce and finance background modified with day to day need based demand . In additions to that advanced Accounting reveals enhanced Knowledge of Commerce up to the developed organization levels

## **PROGRAMME SPECIFIC OUT COME**

**PSO1:** It provides progressive learning of different tax issues and computerized Accounting Patterns

**PSO2:** Students able to explain the advanced values and role of Commerce in the society

**PSO3:** Students gained knowledge on different career skills to catch an Employment in a business field

## **B.COM (CA) PROGRAMME OUT COME**

**PO1:** It provides knowledge not only on commerce but also the use of software technology in their professional requirements

**PO2:** It trained students in computer applications in their three years course time which is essential for a business man in the fields of Commerce and Software

**PO3:** It gives reputed job opportunity to a student of B.com (CA) in the Computer field

## **PROGRAMME SPECIFIC OUT COME**

**PSO1:** It provides job opportunities in the software industry

**PSO2:** It also provides job opportunities in the fields of stock markets , banking field , e-commerce based jobs, probationary officers and loans collection officers in various banks

**PSO3:** They also eligible for teaching posts in schools and colleges and also eligible to write Net or Set Exam

# **D.R.W. COLLEGE (AUTONOMOUS) :: GUDUR**

## **DEPARTMENT OF COMPUTER SCIENCE**

### **COURSE OUTCOMES**

#### **BSC (MATHEMATICS, STATISTICS, COMPUTER SCIENCE)**

##### **I SEMESTER:**

##### **1116-B: Computer Fundamentals & Photoshop**

**CO1:** To understand the basic concept of computers and its devices

**CO2:** To learn the concepts computer memory and processors and working with number system

**CO3:** To know the knowledge on algorithms and programming languages

**CO4:** To gain the basic knowledge on computer networks and internet

**CO5:** To work with adobe Photoshop Tools

##### **II SEMESTER:**

##### **2216-B :PROGRAMMING IN C**

**CO1 :** To gain the knowledge on Algorithms and Programming Languages

**CO2 :** To grab the in detail concepts of decision control ,Looping statements and Functions

**CO3 :** To make the student familiar with the concepts of arrays and Strings

**CO4 :** To understand the basic concepts of Pointers, Structures, Unions and Enumerated data types.

**CO5 :** To know the fundamental concepts of Files and Error Handling during File operations.

### **III SEMESTER :**

#### **3316-A:OBJECT ORIENTED PROGRAMMING USING JAVA**

- CO1:** To understand the basic concepts of object programming and java evolution
- CO2:** To gain the knowledge on operators, Expression and decision control statements
- CO3:** To familiar with classes ,objects and methods in object oriented programming
- CO4:** To learn about interfaces, packages and Multithreaded programming
- CO5:** To understand the concept of Exception Handling and Applet Programming and Error Handling during File operations.

### **IV SEMESTER:**

#### **4416: DATA STRUCTURES**

- CO1 :** To gain the knowledge on Data Structure Operations
- CO2 :** To acquire the basic knowledge of stacks and queues
- CO3 :** To explain the overall theme of Trees and Different types of Trees
- CO4 :** To make the student familiar with Graphs and its Algorithms
- CO5 :** To make the student do the programming by using searching and sorting Algorithms

### **V SEMESTER:**

#### **55162: DATABASE MANAGEMENT SYSTEM**

- CO1:** To Understand the basic concepts of data and Information, and also to gain the knowledge on the classification of database systems
- CO2:** To know the drawbacks of file based system and how to apply the integrity rules on data
- CO3:** To acquire the knowledge on Entity-Relationship model and Normal Forms
- CO4:** To gain the knowledge of SQL commands and how to manipulate data in the database with these commands.
- CO5:** To understand the concepts of PL/SQL, Triggers and cursors.

## **55161: SOFTWARE ENGINEERING**

- CO1:** To acquire the concept on evolving role in software
- CO2:** To understand the different types of process models
- CO3:** To learn about the requirement engineering process and analysis models
- CO4:** To gain the knowledge on software design
- CO5:** To know the different types of software testing and the concept of software quality

### **VI SEMESTER:**

## **6161: WEB TECHNOLOGIES**

- CO1 :** To explain the basic concepts of History of Internet, www and www Tools
- CO2 :** To make the student well know with email Creation and Protocols
- CO3 :** To make the students work with HTML Tags in the creation of web pages
- CO4 :** To gain the knowledge on Forms and Hyper Links in Horizontal Rule Tags
- CO5 :** To grab the knowledge on advance HTML & Cascading style sheets

## **616CLA2:COMPUTER NETWORKS**

- CO1 :** To get the basic knowledge on Networks, Topologies and different types of reference model
- CO2 :** To gain the knowledge on data link layer and data link protocols
- CO3 :** To explain the concept of network layer and its protocols
- CO4 :** To understand the concept of Transport Layer and Security
- CO5 :** To know basic knowledge on DNS, Protocol of Application Layer, WWW

## **616CLA1: CLOUD COMPUTING**

- CO1 :** To know the basic knowledge of cloud computing and its essential characteristics.
- CO2 :** To explain the concepts of cloud scenarios and benefits of cloud computing
- CO3 :** To gain the knowledge of cloud architecture and delivery models

**CO4 :** To understand the concept Cloud deployment models and its advantages

**CO5 :** To gain the knowledge of virtualization and its types in cloud computing

## **BCOM (COMPUTER APPLICATIONS):**

### **I SEMESTER:**

#### **1108-4C-B: COMPUTER FUNDAMENTALS & PHOTOSHOP**

**CO1:** To understand the fundamental concepts of computers and I/O devices

**CO2:** To acquire skill in number system and computer codes

**CO3:** To familiar the student with computer software and Algorithms and programming languages

**CO4:** To know the basic concepts of computer networks and internet

**CO5:** To develop various applications by using adobe photoshop

### **II SEMESTER:**

#### **2208-4C-B:PROGRAMMING IN C**

**CO1:** To gain the knowledge on Algorithms and Programming Languages

**CO2 :** To understand the in detail concepts of decision control ,Looping statements and Functions

**CO3 :** To make the student familiar with the concepts of arrays and Strings

**CO4 :** To know the basic concepts of Pointers, Structures, Unions and Enumerated data types.

**CO5 :** To grab the fundamental concepts of Files and Error Handling during File operations.

### **III SEMESTER:**

#### **3308-4-C-A:OFFICE AUTOMATION TOOLS**

- CO1:** To work with basic concepts of MS-Excel
- CO2:** To manipulate the sheets with formatting options in Excel
- CO3:** To design different charts in Ms-Excel
- CO4:** To create simple database and forms in MS-Access
- CO5:** To access the data by using Query in Ms-Access

### **IV SEMESTER:**

#### **4408-4C:OBJECT ORIENTED PROGRAMMING WITH C++**

- CO1 :** To gain the basic knowledge on OOP and difference between OOP and Procedure oriented programming language.
- CO2 :** To understand the basic knowledge of c and c++ and sample programs
- CO3 :** To acquire the knowledge of functions and arrays of C++
- CO4 :** To gain the basic knowledge on Objects ,Classes, Constructors and Destructors
- CO5 :** To make the student familiar with Operator overloading and inheritance

### **V SEMESTER:**

#### **55086-C: PROGRAMMING IN JAVA**

- CO1:** To know the fundamental concepts of OOPS
- CO2:** To create the programming by using of Arithmetic operators, Data Types and Literals
- CO3:** To make the student good at Control structures and Looping Statement
- CO4:** To gain the knowledge on classes, objects, Methods and Arrays
- CO5:** To grab the knowledge on Interfaces and exception Handling and Thread concepts

#### **55085-C: WEB TECHNOLOGY**

- CO1:** To understand the basic concept of internet
- CO2:** To gain the knowledge on email accounts and email protocols

**CO3:** To design the web pages by using HTML tags

**CO4:** To explain the tables ,hyperlinks and frames and forms in HTML

**CO5:** To know the knowledge of advance HTML by using cascading style sheets

## **VI SEMESTER:**

### **608CEL01: OPERATING SYSTEMS**

**CO1 :** To get the knowledge of Operating Systems and its evolution

**CO2 :** To Understand the knowledge of kernels, System calls and scheduling algorithms

**CO3 :** To make the student familiar with File System Interfaces

**CO4 :** To know the basic concepts of Deadlocks ,Detection and Recovery

**CO5 :** To grab the concepts of Memory management and virtual memory

### **608CCLA2: E-COMMERCE APPLICATION**

**CO1 :** To learn the basic concepts on E-commerce ,Online shopping and E-Business

**CO2 :** To gain the basic concepts of Supply Chain Management

**CO3 :** To know the basic knowledge on Electronic Payment System

**CO4 :** To create the sample programs using simple java script

**CO5 :** To understand the knowledge on Control statements and Repetition Statements

### **608CCLA1:DATABASE MANAGEMENT SYSTEM**

**CO1 :** To know the overview of database management system and DBMS Architecture

**CO2 :** To acquire the fundamental information of File based System and Relational Database models

**CO3 :** To understand the Entity Relationship Model in DBMS and Normalization

**CO4 :** To make the student proficient in doing databases by using of structured query language

**CO5 :** To create the sample programs by using of PL/SQL

## **BCOM (GENERAL):**

### **SEMESTER I:**

#### **1108-4-A: FUNDAMENTALS OF INFORMATION TECHNOLOGY**

**CO1:** To know the basic concepts of computers and input devices

**CO2:** To acquire on the knowledge on modern communication such as FAX, Video conferencing and teleconferencing etc

**CO3:** To gain the knowledge on operating system and its functions

**CO4:** To make the student familiar with enabling technologies of world wide web

**CO5:** To understand the concept of Multi Media , Internet and E-commerce

### **II SEMESTER**

#### **2208-4-A: MS-OFFICE**

**CO1 :** To gain the overall knowledge of MS-WORD

**CO2 :** To grab the overall concepts of MS-EXCEL

**CO3 :** To understand the total knowledge on MS-ACCESS

**CO4 :** To know the in detail concepts of MS-POWERPOINT

**CO5 :** To make the student create the letter heads and business cards in MS PUBLISHER

### **III SEMESTER:**

#### **3308-4-A: PROGRAMMING IN C**

**CO1:** To gain the basic knowledge of c-Programming

**CO2:** To develop programs by using the concept of Decision Control and Looping Statements

**CO3:** To make the student familiar with functions in c

**CO4:** To get the ability to do programs by using Arrays and Strings

**CO5:** To absorb the knowledge on the concepts of Structures and Union in c-Language

#### **IV SEMESTER:**

#### **4408-4: PROGRAMMING IN C++**

**CO1 :** To acquire the fundamental knowledge of C++,Creating sample programs ,keywords, Tokens

**CO2 :** To gain the full knowledge of Operators, Functions and Data types in C++

**CO3 :** To make the student proficient in doing programming by using of branching & looping statements in c++

**CO4 :** To acquire the in detail knowledge on Functions and arrays

**CO5 :** To gain the basic knowledge on Objects and Classes.

#### **V SEMESTER:**

#### **55085: DATABASE MANAGEMENT SYSTEMS**

**CO1:** To design Database Systems Data Sharing

**CO2:** To understand concept of ER model

**CO3:** To explain Normalization techniques

**CO4:** To study the File Organization, Distributed Database Systems

#### **55086: ELECTRONIC COMMERCE**

**CO1:** To get overview on E-Commerce

**CO2:** To grab the knowledge on E-Commerce and WWW with Architecture frame work  
Technology behind the web

**CO3:** To learn about consumer oriented E-commerce Application

**CO4:** To acquire the knowledge on Web Based marketing

## **BSC (HONOURS) COMPUTERS**

### **SEMESTER-I**

#### **1121-A:Programming Fundamentals using C/C++**

- CO1:** To understand the basic knowledge on c and c++ and how to compile and execute the sample programs
- CO2:** To gain the knowledge on conditional control statements ,functions And arrays
- CO3:** To develop programs by using the concept of structure and pointers
- CO4:** To differentiate the static and dynamic memory allocations and also the file processor directives
- CO5:** To know the knowledge on the principles of object oriented programming

#### **1122-A:COMPUTER SYSTEM ARCHITECTURE**

- CO1:** To understand basic concepts LOGIC GATES,FLIPFLOPS,REGISTERS AND COUNTERS in computer organization
- CO2:** To gain the knowledge on Number System
- CO3:** To acquire the knowledge on Bus System, Instruction Cycle and Timing and control
- CO4:** To learn about various concept of central processing such as Addressing Modes, Instruction Codes etc..
- CO5:** To study on Memory Organization and Input Output Organization

### **II SEMESTER**

#### **2221-A: PROGRAMMING IN JAVA:**

- CO1 :**To get the basic knowledge on Java, DataTypes ,Java Methods
- CO2 :**To understand the concepts of Arrays ,Strings and I/O files
- CO3 :**To know the overview concept of Object Oriented Programming
- CO4 :**To make the student familiar with managing errors and Exceptions and Multi Threaded Programming

CO5 :To acquire the knowledge of applets and Event Handling

### **III-SEMESTER**

#### **3321-A:OPERATING SYSTEMS**

CO1: To Understand the basic concepts of operating System, personal computers and work-station

CO2: To gain the knowledge on kernels and system calls

CO3: To practice the scheduling algorithms of Pre-empitive and Non Pre-empitive

CO4: To learn about the memory management, paging and virtual memory

CO5: To understand the concept of File and I/O Management

#### **3323-A: DATA STRUCTURES**

CO1: To gain the basic knowledge on Arrays and Linked List

CO2: To acquire on the knowledge on stacks and queue

CO3: To get the knowledge on Recursion concepts and basic concepts of Trees

CO4: To make the student good at searching and sorting techniques

CO5: To gain the basic knowledge on Hashing and Hash Function

#### **3322-A: COMPUTER NETWORKS**

CO1: To understand the basic concepts of networks and different types of Reference models

CO2: To understand the concept of encoding and decoding techniques and switching techniques

CO3: To acquire the knowledge on error detection and correction techniques

CO4: To know the concept of different types of multiple access protocols

CO5: To learn about different types of protocols and transport layer functions

### **IV SEMESTER:**

#### **4422-A: DESIGN AND ANALYSIS OF ALGORITHM**

CO1 : To get the basic design and analysis techniques of Algorithms and Asympotic notations

CO2 : To know the basic knowledge on DIVIDE & CONQUER,Dynamic Programming and Greedy Algorithms

CO3 : To acquire the knowledge on Elementary and Advanced Sorting Techniques

**CO4 :** To get the knowledge on Lower Bounding Techniques & advanced analysis Technique

**CO5 :** To gain the knowledge on Graph Algorithms and String Processing

### **4421-A: SOFTWARE ENGINEERING**

**CO1 :** To acquire the concept on evolving role in software ,Process models & CMMI

**CO2 :** To understand the software requirement analysis

**CO3 :** To learn about the Software project Management and Risk Management

**CO4 :** To gain the knowledge on Quality management and design Engineering

**CO5 :** To know the different types of software testing ,Testing strategies and Tactics

### **4423-A: DATABASE MANAGEMENT SYSTEM**

**CO1 :** To know the characteristics and models of DBMS

**CO2 :** To design the application by using ER and Relational model

**CO3 :** To design the database by using EER and applying normal forms in the database

**CO4 :** To know about the transaction processing in DBMS

**CO5 :** To extract the knowledge in File structure and indexing in DBMS

## **V SEMESTER**

### **5521:INTERNET TECHNOLOGIES**

**CO1:** To Understand the fundamental concepts of javascript

**CO2:** To acquire the knowledge on JDBC fundamentals, creating and executing SQL statements

**CO3:** To gain the knowledge on Java server pages, Servlets

**CO4:** To implement programs on Implicit JSP Objects and Error handling and debugging

**CO5:** To work with JavaBeans

### **5522:THEORY OF COMPUTATION**

**CO1:** To gain the basic knowledge on operations Automata Theory, string and Kleene Star

**CO2:** To grab the concepts on Finite Automata Theory

**CO3:** To Understand Regular Expressions

**CO4:** To acquire the knowledge on Context free languages and its properties

**CO5:** To learn about Turing Machines and Models of computation

### **5523:DATA MINING**

**CO1:** To understand the basic concepts of data mining concepts and also gain the knowledge on issues in data mining

**CO2:** To know the preprocessing steps of data mining

**CO3:** To learn about data characterization and comparison in data and how to derive the association rules

**CO4:** To analyze the the issues regarding classification and predictions

**CO5:** To understand the concept of cluster analysis and type of models in cluster analysis

### **5524:INFORMATION SECURITY**

**CO1:** To know about basic knowledge about security problems in computing

**CO2:** To gain basic things on substitution cipher and transposition cipher, algorithms

**CO3:** To understand the basic concepts of program security and file protection mechanisms

**CO4:** To understand the concept of database security and security in networks

**CO5:** To grab the knowledge on administrating security, legal privacy and ethical issues in Computer security

## **VI SEMESTER:**

### **6622: ARTIFICIAL INTELLIGENCE**

**CO1 :** To know the basic concepts of Artificial Intelligence and Turing Test and Relational to Agent Approaches

**CO2 :** To analyze various problem solving and searching Techniques

**CO3 :** To Capture the knowledge in the programming language of PROLOG

**CO4 :** To deal with uncertainty and inconsistency by using Truth Maintenance system

**CO5** : To understand the Natural languages such as Parsing Techniques and Context free and Transformational Grammars

### **6623: CLOUD COMPUTING**

**CO1** : To know the basic knowledge of cloud computing and its essential characteristics.

**CO2** : To explain the concepts of cloud scenarios and benefits of cloud computing

**CO3** : To gain the knowledge of cloud architecture and delivery models

**CO4** : To understand the concept Cloud deployment models and its advantages

**CO5** : To gain the knowledge of virtualization and its types in cloud computing

### **6621: COMPUTER GRAPHICS**

**CO1** : To have the basic concepts of computer graphics

**CO2** : To capture the knowledge on output primitives like point and lines, circle and ellipse algorithms

**CO3** : To acquire the knowledge on 2-D geometric Transformations and 2-D Viewing

**CO4** : To get the basic knowledge on 3-D geometric Transformations and 3-D Viewing

**CO5** : To develop the applications by using Color models and Applying Animations

### **BSC (HONOURS) MATHEMATICS:**

#### **I SEMESTER:**

#### **1121-A: OBJECT ORIENTED PROGRAMMING IN C++**

**CO1:** To provide the knowledge relating to the OOP Paradigm.

**CO2:** To provide the knowledge relating to the OOP Paradigm

**CO3:** To provide the knowledge relating to the OOP Paradigm

**CO4:** To develop programming by using Cin, Cout concepts on C++.

**CO5:** To make the student proficient in c++ with the concepts of OOP

#### **III SEMESTER:**

## **COMPUTER GRAPHICS**

**CO1:** To Understand The Concepts Of Video Display Devices, Refresh Cathode Ray Tubes, Raster Scan and Random Scan Displays

**CO2:** To have a knowledge on Raster Scan system

**CO3:** To acquire the knowledge on Interactive input/output devices:

**CO4:** To know about Points, lines and curves, line-drawing algorithms, circle and ellipse , polygon generation

**CO5:** To grab the concepts of Two-dimensional viewing

### **IV SEMESTER:**

## **OPERATING SYSTEM: LINUX**

**CO1 :** To know the basic knowledge on basic OS Functions and LINUX

**CO2 :** To get the basic knowledge on System Process and File System

**CO3 :** To make the student good at User Management and GUI Tools

**CO4 :** To acquire the good knowledge in Resource Management in Linux

**CO5 :** To have the basic concepts on IPC ,Memory Management and System calls

# **D.R.W. COLLEGE (AUTONOMOUS) :: GUDUR**

## **DEPARTMENT OF COMPUTER SCIENCE**

**2018-19**

### **COURSE OUTCOMES**

## **MASTER OF COMPUTER APPLICATIONS(MCA)**

### **SEMESTER-III**

#### **30801A: SOFTWARE ENGINEERING**

**CO1:** To study the body of software engineering and process models

**CO2:** To acquire the knowledge and the concepts of Umbrella activities ,Measurement & Metrics in Software Engineering

**CO3:** TO be able to design the software by using the quality guideline and attributes and also analyzing the architecture

**CO4:** To know about the testing strategies like white Box ,Black Box etc

#### **30802A: DATABASE MANAGEMENT SYSTEM**

**CO1:** To understand the basic concepts of data base and also to design the database by using ER-Model

**CO2:** To gain the knowledge on relational model and also manipulate the data by relational algebra and calculus

**CO3:** To access the data by using SQL Queries cursors and Triggers

**CO4:** To learn about database base application development with JDBC and also the development of Internet Applications

### **30803: DATA COMMUNICATIONS AND COMPUTER NETWORKS**

**CO1:** To understand the fundamental concepts of Network models and physical layer concepts

**CO2:** To classify the media access control protocols and various Ethernet protocols

**CO3:** To demonstrate various Network layer protocols such as unicast and multicast protocols

**CO4:** To outline the mechanisms involved in transport layer and virtual private network

### **30804A: ADVANCED JAVA PROGRAMMING**

**CO1:** To Understand the basic concepts of J2EE with different implementations

**CO2:** To know the J2EE database concepts, JDBC Objects and embedded SQL

**CO3:** To acquire the knowledge on XML ,SERVLETS and JSP

**CO4:** To gain the knowledge of java beans ,CORBA and RMI

### **30805A: COMPUTER GRAPHICS**

**CO1 :** To have the basic concepts of computer graphics and to capture the knowledge on output primitives like point and lines, circle and ellipse algorithms

**CO3 :** To acquire the knowledge on 2-D geometric Transformations and 2-D Viewing

**CO4 :** To get the basic knowledge on 3-D geometric Transformations and 3-D Viewing

**CO5 :** To develop the applications by using Color models and Applying Animations

## **SEMESTER-IV**

### **40801A: DESIGN AND ANALYSIS OF ALGORITHMS**

**CO1:** To understand the basic concepts of analysis of algorithms and disjoint sets

**CO2:** To classify the different algorithm techniques of greedy method

**CO3:** To Develop algorithms for various computing problems

**CO5:** To demonstrate the branch and bound techniques for problem solving

### **40802A: SYSTEMS PROGRAMMING**

**CO1:** To understand the basic concept of system programming and assemblers

**CO2:** To gain the knowledge on Loaders and Linker concepts

**CO4:** To explain the concepts of micro processors

**CO5:** To grab knowledge of compilers and their functions

### **40803: WEB PROGRAMMING**

**CO1:** To gain the basic knowledge of Internet and XHTML

**CO2:** To develop programs by using the concept of Decision Control and Looping Statements using Javascript.

**CO3:** To make the student familiar with DHTML and implement the programs

**CO4:** To get the ability to do programs by using XML

### **40804: USER INTERFACE DESIGN**

**CO1:** To know the basic concepts of Human factors of interactive software and Expert reviews, usability testing, surveys and containing assessments

**CO2:** To acquire on the knowledge on Software tools and Command and natural languages

**CO3:** To gain the knowledge on Interaction Devices

**CO4:** To make the student familiar with Multiple Window strategies and Hyper Media and the World wide web

## **40804A: DATA MINING & DATA WAREHOUSING**

- CO1:** To know the fundamental concepts of Data mining and OLAP technology
- CO2:** To demonstrate the use of multidimensional model in data warehousing
- CO3:** To generate the association rules and differentiate the classification prediction algorithms
- CO4:** To gain the knowledge on various clustering algorithms and their applications

## **44444: INFORMATION & COMMUNICATION TECHNOLOGY-I**

- CO1:** To know the fundamental concepts of C- language
- CO2:** To develop the programs applying conditional and branching statements of C-programming
- CO3:** To acquire the knowledge on functions, storage classes and pointers of C-programming
- CO4:** To work with Arrays and files to develop programs.

## **SEMESTER-V**

### **50801: COMPUTER GRAPHICS**

- CO1 :** To have the basic concepts of computer graphics and to capture the knowledge on output primitives like point and lines, circle and ellipse algorithms
- CO3 :** To acquire the knowledge on 2-D geometric Transformations and 2-D Viewing
- CO4 :** To get the basic knowledge on 3-D geometric Transformations and 3-D Viewing
- CO5 :** To develop the applications by using Color models and Applying Animations

### **50802: OBJECT ORIENTED SYSTEMS DEVELOPMENT**

- CO1:** To get overview on OOAD concepts and various UML diagrams
- CO2:** To grab the knowledge on OO analysis and unified modeling language and patterns
- CO3:** To learn about access layer and view layer in OOAD
- CO4:** To acquire the knowledge on testing strategies and debugging concepts

### **50803: SYSTEMS PROGRAMMING**

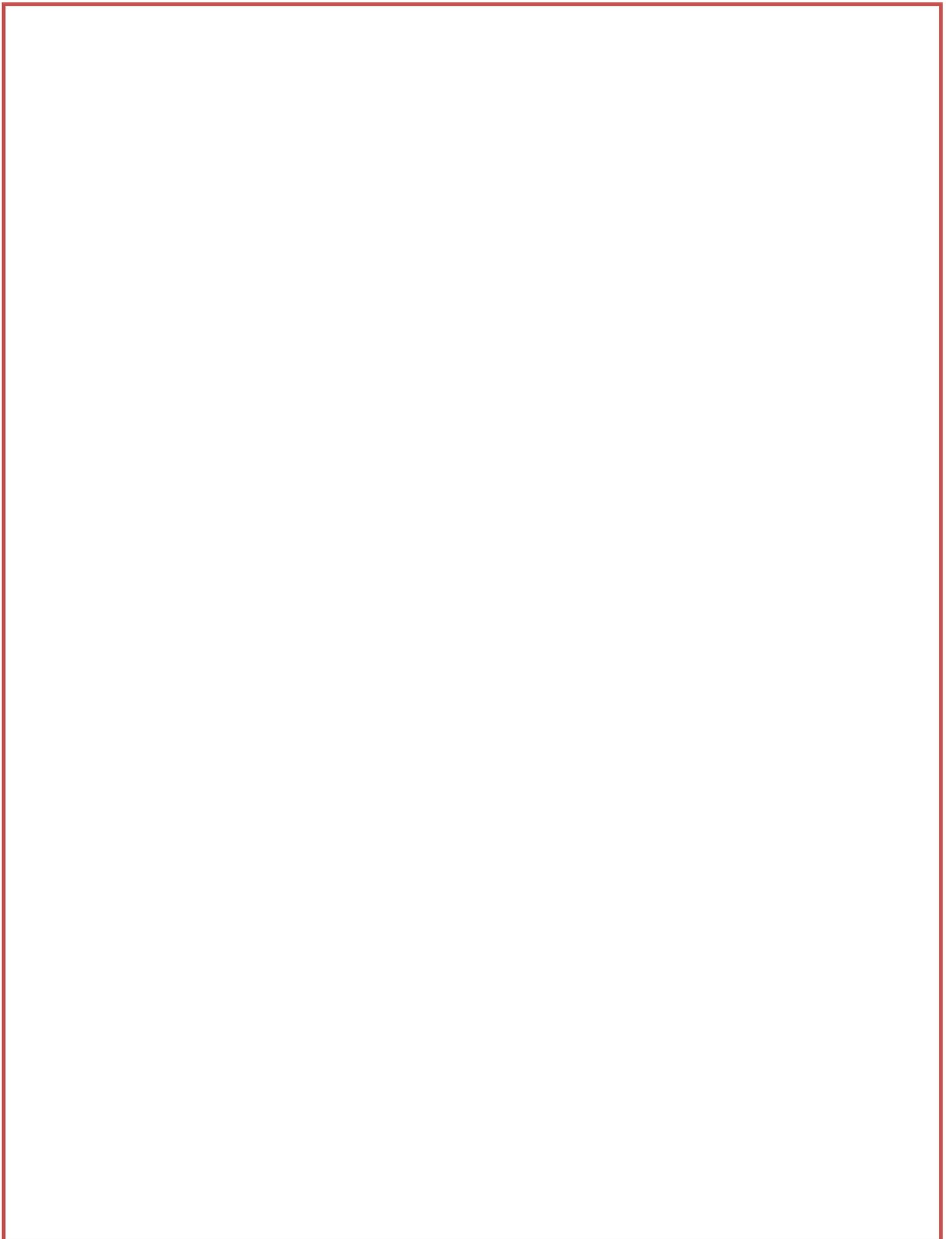
- CO1:** To understand the basic knowledge on System software and assemblers
- CO2:** To gain the knowledge on loading and linkers and Macro processors
- CO3:** To gain the basic knowledge on compilers and system software
- CO4:** To know the in detail information about operating systems and device drivers
- CO5:** To know the knowledge on character driver 1&2 and Block drivers 1&2

### **50804 : DECISION SUPPORT SYSTEMS**

- CO1:** To understand basic concepts of decision support systems & information quality and models
- CO2:** To gain the knowledge on DSS architecture, Hardware and operating system platforms
- CO3:** To acquire the knowledge on Models in decision support systems & mathematical models and optimization.
- CO4:** To learn about various concept of Group decision support systems – expert systems.
- CO5:** To study on data warehousing and executive information system fundamentals

### **50805 : MULTIMEDIA SYSTEMS**

- CO1:** To gain the basic knowledge on Media and Data Streams, Sound/ Audio
- CO2:** To acquire on the knowledge on Video and Animation & Some Basic Compression Techniques
- CO3:** To get the knowledge on Optical Storage Media Basic Technology & Computer Technology
- CO4:** To make the student good at Multimedia operating Systems & Additional Operating System Issues
- CO5:** To gain the basic knowledge on Multimedia Communication Systems & Database Systems



## **ECONOMICS**

### **Course Outcomes : (COs)**

#### **Semester –I**

##### **Microeconomic Analysis –I- Consumer Behaviour.**

**CO1:**To know the nature , scope , definitions of economics and consumer behavior.

**CO2 :** To Understand the difference between Micro and Macro Economics, Economic analysis methods.

**CO3:** To know the Demand analysis and types of elasticity of demand .

**CO4:** To Know the concepts ,functions, types of Utility analysis.

**CO5:** To Know the Indifference curves definitions, functions, behavior, features & consumer surplus.

#### **Semester- II**

##### **Microeconomic Analysis –II-Production Value an Price Theory.**

**CO1:**To know the concepts, definitions of production & production costs.

**CO2:**To understand the definitions &types of Markets, price discriminations.

**CO3:**To know the different types of Markets, Kinked demand curve analysis.

**CO4:**To understand the Marginal productivity theory of distribution.

**CO5:**To analyze the theories of Rent, Wages ,Profit, Interest.

#### **Semester - III**

##### **Macroeconomic Analysis-I-National Income, Employment and Money.**

**CO1:** To know the Meaning, importance of Macroeconomics.

**CO2:** To understand National Income definitions and Measurement and to analyze the theories of Two, Three and Four Sector Economy model.

**CO3:** To get knowledge about Classical Theory of Employment & Say's Law of Market.

**CO4:** To acquire knowledge on Keynesian Theory of Employment and Consumption and Marginal Efficiency of Capital .

**CO5:** To analyze the concept of Money – functions , types and theories.

## **Semester -IV**

### **Macro Economic Analysis-II- Banking and International Trade.**

**CO1:** To get knowledge about Trade Cycles & Inflation, Phases of Trade Cycles and Types of Inflation and Impact on Economy.

**CO2:** To know the concept of Bank, definitions & functions of Bank and analyze the current economic problems.

**CO3:** To understand the importance of Non Banking Financial Institutions and defects of Indian Money Market.

**CO4:** To be able to describe the Stock markets, Insurance and importance of Life Insurance.

**CO5:** To be able to explain the Macro Economic Policies and International Trade Theories.

## **Semester-V-Paper-V**

### **Economic Development and Indian Economy.**

**CO1:** To know the concepts of Economic Growth & Economic Development and knowledge about measurement of Economic development & theories of Economic growth.

**CO2:** To have knowledge about Balanced & Unbalanced growth theories.

**CO3:** To Understand various aspects of Indian Economy using other Environmental Resources available in modern ICT tools.

**CO4:** To know the concepts of National Income perspective on different problems. Inequalities, Poverty and Unemployment and approaches to Economic development and growth in India.

**CO5:** To analyze the concepts of Economic Reforms (LPG) & Inclusive Growth.

## **Semester – V-Paper-VI**

### **Title of the Paper: Indian and AP Economy.**

**CO1:** Students will familiar about importance of Indian Economic Agriculture and price policies.

**CO2:** To get knowledge about growth of Indian Industrial Sector, Industrial policies and approaches in India.

**CO3:** To understand the Importance of Indian Service Sector.

**CO4:** To analyze economy, agriculture, Industrial and service sectors problems and approaches in AP.

**CO5:** To be able describe Planning in Indian Economy & NITI Aayog.

## **Semester – VI-Paper-VII**

### **Public Finance**

**CO1:** To know the Meaning and Scope of Public Finance and difference between Public & Private Finance and to analyze the Principle of Maximum Social Advantage Theory .

**CO2:** To get knowledge about Sources of Public Revenue & various approaches of taxation.

**CO3:** To be able to discuss about classification of Public Expenditure and analyze Laws of Peacock-Wiseman Hypothesis.

**CO4:** To understand the classification & methods of Public Debt.

**CO5:** To understand the Budget ,deficit Financing and its impact.

## Electronics Outcomes

2018-19 Basic circuit theory(1117-a)

CO1 The student can learn about the general format of sin wave and generation, ac and dc currents.

Co2 To study the active and passive networks.

Co3 The student can understand the concepts on network theorems and problems solving.

Co4 To understand the RC,RL circuits of frequency ,transient response and their applications.

Co5 To gain knowledge on series and parallel resonance circuits, Q-factor, band width.

Electronic devices and circuits(2217)

Co1 The student can understand the formation of various types of junction diodes and it's characteristics.

Co2 To learn about the construction, working ,characteristics of bipolar junction transistor and it's biasing.

Co3 To know about the construction, working and applications of FET,UJT and SCR.

Co4 To gain about the knowledge on photo electric devices.

Co5 To learn about the concepts on rectifiers, filters and three terminal regulators.

Digital electronics(3317-a)

Co1 The student can learn about the number system, codes and code conversion from one to another

Co2 To understand the concepts of Boolean theorems, De-Morgan's laws, logic gates and minimization techniques.

Co3 To learn about the concepts on combinational digital circuits and IC-logic families.

Co4 To understand the concepts on sequential digital circuits and their working.

Co5 To learn about the general memory operation, RAM,ROM,EPROM,EEPROM,PAL and PLA. Analog and digital ic applications(4417-a)

Co1 To know the concepts on basic op-amp characteristics and parameters.

Co2 To understand the op-amp circuits and their applications.

Co3 To learn about the design of code converters, counters using state machine.

Co4 To gain the good knowledge on A/D and D/A data convertors.

Co5 To gain about digital system interfacing and applications of counters and shift registers.

## **COURSE OUTCOMES :**

### **SEMESTER –I**

#### **English**

- CO-I** To Protect our ancient knowledge and culture and focus attention on intellectual rights and related issues.
- CO-II** Enabling Students to gain knowledge about countless contributions of India to the world and moral values.
- CO-III** Poetry inspires to do things that few people dare to do to explore things.
- CO-IV** To fill with passionate belief in the beauty and power of nature which gives relaxation in depression.
- CO-V** To explore the relation and interaction between man and nature.
- CO-VI** To understand the theme of compassion, which helped students to understand the life of Indian family and the reactions of villagers for surrounding incidents.
- CO-VII** Prescribed grammar is useful for perfect construction in English. To Know the purpose of parts of speech to denote the functions of a word in a sentence regarding its meaning and grammar.

### **SEMESTER –II**

- CO-I** Students will know that average man and woman should be guided by false Principles unless and until humans adopt scientific point of view.
- CO-II** Short essays are delightful, humorous and thought provoking.
- CO-III** Students will get awareness, yet one should not neglect the impact of the season.
- CO-IV** Students will have awareness about the theme of discontent, gossip, appearance, reliance, control, anxiety, panic and trust by reading short stories.
- CO-V** By reading the poem “I am not that woman” Students will have knowledge about empowerment of women. Women deserve respect and they are not commodities. Linking women’s value and self worth, Women should appreciate and confidently respect themselves, which is the need of the hour.

**CO-VI**with the effective Literacy Programs like guided composition, reading comprehension etc., students involve in reading and writing skills, which support and extend their literacy learning and skills.

### **SEMESTER –III**

**CO-I** Students will get message that “silence is a part of spiritual discipline and votary of truth. In a gentle way, we can shake the world. Strength does not come from winning. Our struggles develop our strengths. When we go through hardships and decide not to surrender - that is strength. ”

It is very useful to Students to manage their mental and emotional problems.

**CO-II** Modernity at large has shattered the faith of a common man in the family life and relations. Unfortunately only rights have been learnt by the students and they seem to have forgotten to learn about their duties. And hence problems seem to have been appearing in the society.

There is a focus on the theme of values of relationship among family members in short stories.

With these short stories Students will get awareness about love, care, understanding, needs, requirements and emotional support of family and society.

**CO-III** Students will get awareness about philosophy of Gurajada by knowing the central theme of One Act play is to expose the evils of child marriage and the prevailing practice of bride price and also suggest widow remarriage, which is a social reform.

**CO-IV** By learning “PROVEBS” students can express a truth based on common sense or experience. Proverbs touch on just about every aspect of life.

**CO-V** Students should able to prepare Note- making, Report writing, Precise writing etc.,

**HINDI**  
**COURSE OUTCOMES**

**I Semester**

- CO I** : Understand and develop the values which are needed in human Life. To improve the language skills through listening, speaking, reading and writing. Prose lessons of Great writers develop an in - depth knowledge and values.
- CO II** : Able to understand the importance of humanity and responsibility through stories.
- CO III** : Understand different characters of play let and to equity oneself with the improved communicative skill with practice in speaking.
- CO IV** : To utilize digital literacy tools to develop grammar skills.
- CO V** : Set acquainted with official terminology in Hindi language.

**II Semester**

- CO I** : To know the greatness of India regarding unity in diversity and also to know about the relationship between culture and literature.
- CO II** : To understand the recognition of a women in the society and to know about the hungry of a born man through short stories.
- CO III** : To Know about the famous novelist Premchand and also to understand the vision of premchand about the problem of a middle class family through his novel Nirmala.
- CO IV** : To develop grammatical skills. To know the meaning and sentence writing of idioms in Hindi.
- CO V** : To Produce appropriate vocabulary and correct forms to improve skills in letter writing.

**III Semester**

- CO I** : To understand the moral values and life skills taught indirectly through poems.
- CO II** : To understand the Concept of History of Hindi literature and also able to understand the basis of the classification of Hindi literature . To know the importance of Kabirdas and Jayasi through Hindi literature.
- CO III** : To develop creative thinking by writing the general essays.
- CO IV** : To understand the translation skills.
- CO V** : To acquire skills of drafting official letters in Hindi.



## **HISTORY**

### **COURSE OUT COMES**

#### **SEMESTER-I**

##### **ANCIENT INDIAN HISTORY AND CULTURE**

( From earliest Time To 600 A.D.)

- CO1: Students should understand what is history, influence of Geography on History, and Economic and culture development in civilization.
- CO2: To get knowledge about the division of society and religious movements.
- CO3: Students will acquire the ability to compare the administration of Mauryan Empire with present system
- CO4: To know and evaluate new religions, socio, economic and cultural Developments in South India.
- CO5: Students should understand the Golden age of Guptas.

#### **SEMESTER-II**

##### **EARLY MEDIEVAL INDIAN HISTORY & CULTURE**

(from 600 A.D to 1526 A.D.)

- CO1: Students should understand the University Education and able to think about Political , Social, Economic and Cultural developments in South India .
- CO2: Students will distinguish among Dravidian languages In South India and Village Administion up to present system.
- CO3: Students will produce their own historical analysis about Dravidian style of Art and Architecture.

CO4: To analyze the impact of Islam on Indian Society.

CO5: Students will acquire knowledge about Bakhti movement and able to compare the difference between both Bakhti and Sufi movements

### SEMESTER-III

#### LATE MEDIEVAL & COLONIAL HISTORY OF INDIA

( 1526 to 1857A.D.)

CO1: To understand the disintegration of India and Rise of Local Powers.

CO2: To know and evaluate the impact of Mughal on Indian culture, Art and Architecture.

CO3: To Analyze the new administrative policies in India.

CO4: To get knowledge about the problems of Agriculture and cottage industries when compared with present situation.

CO5: To get knowledge about 1857 Revolution.

### SEMESTER –IV

#### Title of the Paper : SOCIAL REFORM MOVEMENT & FREEDOM STRUGGLE

( 1820 to 1947A.D.)

CO1: To know the impact of Renaissance on society and struggle against cast.

CO2: Students should understand British colonial under viceroys' Rule and the Genesis of Freedom.

CO3: To Analyze the effects of extreme terrorism .

CO4: To Analyze and acquire the principles of Ahimsa and Sathyagraha and their impacts on freedom movement.

CO5: To understand Muslim League & the growth of communalism, and service of Sardar Vallabhai Patel

SEMESTER-V

PAPER -V

AGE OF RATIONALISM AND HUMANISM

(The World Between 15<sup>th</sup> &18<sup>th</sup> Centuries)

CO1: To get know ledge about the feudalism, Geographical Discoveries an its effects on the World.

CO2:To know the impact of Renaissance on the Europe culture .

CO3: To get knowledge about emergence of Nation states, Reformation of a religion and its effect , Origin of parliament and Constitutional development.

CO4: To get knowledge about the effect of colonialism, declaration Independence and Bill of rights.

CO5:To know about Age of Revolutions.

SEMESTER-V

PAPER -VI

HISTORY&CULTURE OF ANDHRA DESA

(From 12<sup>th</sup> Century A.D.)

CO1: To know about the importance of Telugu languages, Society culture, Art and Architecture.

Co2: To learn and evaluate the administration and literature of South India.

CO3: Student should able to know and discuss the impact of Musli on Andhra Desa.

Co4: To know and evaluate the change in Revenue system introduced by Europeans, peasantry and Tribal Revolts.

Co5: To get knowledge about the changes in society of Andhra Desa due to Modern education and the development in the Culture of Andhra.



## **MATHEMATICS**

### **M.P.C., M.S.Cs., M.P.E**

#### **Course Outcomes**

##### **SEMESTER- I: PAPER –I: DIFFERENTIAL EQUATIONS      PAPER CODE: 1110-B**

CO1: To study various techniques of solving first order and first degree differential equations.

CO2: To know equations solving methods of first order but not of first degree.

CO3: To study various techniques of higher order linear homogeneous differential equations

CO4: To study various techniques of higher order linear non homogeneous differential equations

CO5: To gain the knowledge of methods of solving higher order differential equations.

##### **SEMESTER- II: PAPER –II: SOLID GEOMETRY                      PAPER CODE: 2210-A**

CO1: To gain knowledge in 3D- dimension, quadratic geometry.

CO2: Students can easily understand the solving techniques for lines and planes.

CO3: Students gain knowledge of sphere and its properties

CO4: To determine the sphere problems by using various formulations.

CO5: Students know the basic definitions and concepts of cone and cylinder.

##### **SEMESTER- III: PAPER –III: REAL ANALYSIS                      PAPER CODE: 3310-A**

CO1: To know the basic concepts of Real numbers and real sequences.

CO2: To understand the infinite series and different types of test for convergence

CO3: To use previous knowledge of continuity

CO4: To know the derivability of a function and mean value theorem.

CO5: To gain knowledge of Riemann integration.

**SEMESTER- IV: PAPER –IV: ABSTRACT ALGEBRA**

**PAPER CODE: 4410-A**

CO1: To know the basic concepts of groups and semi groups.

CO2: To gain the knowledge of subgroups and its operations.

CO3: To study the concepts of cosets and Lagrange's theorem and normal subgroups.

CO4: To gain the Knowledge of homomorphism, Isomorphism and Automorphism of groups.

CO5: To gain the complete knowledge of permutation groups and cyclic groups.

**SEMESTER- V: PAPER - V: RING THEORY&MATRICES**

**PAPER CODE: 55101**

CO1: The students can study the concept of rings and fields, Integral domains.

CO2: To understand the concept of characteristics of rings.

CO3: To learn Homomorphism of rings.

CO4: To understand the matrices and to solve their problems.

CO5: To aware the importance of Matrices and characteristics roots and values.

**SEMESTER- V: PAPER VI - LINEAR ALGEBRA**

**PAPER CODE: 55102**

CO1: To gain knowledge of basic concepts of vector spaces, subspaces, basis and dimension.

CO2: To study linear transformation and its properties.

CO3: To find Eigen values and Eigen vectors by using cayley Hamilton theorem.

CO4: To gain knowledge of basic definitions and concepts of inner product spaces.

CO5: To gain knowledge of orthogonality and orthonormal.

## **SEMESTER- VI: ELECTIVE PAPER - VII: VECTOR CALCULUS**

**PAPER CODE: 610EL01**

CO1: To study the concept of vector differentiations and Gradient of scalar point function.

CO2: To gain knowledge in curl of vector and divergence of vectors and its applications.

CO3: To study the concept of vector identities.

CO4: To gain knowledge of vector integration and volume integral

CO5: To study the concept of Gauss divergence, Greens, Stoke's theorems and its applications.

## **SEMESTER- VI: CLUSTER PAPER VIII: LAPLACE TRANSFORMS**

**PAPER CODE: 610CLA1**

CO1: To study the basic definitions and concepts of Laplace transforms..

CO2: To know the first and second shifting theorems, change of scale property, initial and final value theorems. .

CO3: To understand complete Laplace transforms of integrals.

CO4: To study basic definitions and concepts of inverse Laplace transforms.

CO5: To describe about the inverse Laplace transforms of derivative and its applications.

## **SEMESTER- VI: CLUSTER PAPER IX: INTEGRAL TRANSFORMS**

**PAPER CODE: 610CLA2**

CO1: To study the application of Laplace transforms for the solutions of differential equations..

CO2: To study the applications of Laplace transforms for the solutions of P.D.E.

CO3: Students will able to know the applications of Laplace transforms of solutions. .

CO4: To describe about the Fourier transforms. .

CO5: To understand complete relation between Fourier and Laplace transforms.

**DEPARTMENT OF MATHEMATICS**  
**COURSE OUTCOMES FOR UG 2018-2019**  
**B.Sc. MATHEMATICS HONOURS**

**SEMESTER- I: CORE PAPER –I: CALCULUS**

**PAPER CODE: 1131**

CO1: To Expertise in Hyperbolic functions and Higher order derivatives

CO2: To study the basic definitions of vector differentiations.

CO3: To study the concept of vector differentiation.

CO4: To study the basic concepts of vector integration and integral circulation problems

CO5: To gain knowledge of Gauss divergence, Green's and stroke's theorems and its applications.

**SEMESTER- I: CORE PAPER II - ALGEBRA**

**PAPER CODE: 1132**

CO1: To recall the previous knowledge of integers and its relevant theorems.

CO2: To know the method of find G.C.D, L.C.M of two numbers by using the canonical representation

CO3: To gain the knowledge of matrices and their applications.

CO4: To find the solutions of Eigen values and Eigen vectors by using Cayley Hamilton theorem

CO5: To know different methods of linear equations.

**SEMESTER- II: PAPER III – REAL ANALYSIS**

**PAPER CODE: 2231**

CO1: To know the basic concepts of Real numbers and real sequences.

CO2: To understand infinite series and different types of test for convergence

CO3: To use the previous knowledge of continuity

CO4: To know the derivability of a function and mean value theorem.

CO5: To gain the knowledge of Riemann integration

## **SEMESTER- II: CORE PAPER –IV: DIFFERENTIAL EQUATIONS**

**PAPER CODE: 2232**

CO1: To study various techniques of solving first order and first degree differential equations.

CO2: To know the equations for solving first order but not first degree.

CO3: To study various techniques of higher order linear homogeneous differential equations

CO4: To study various techniques of higher order linear non homogeneous differential equations

CO5: To gain the knowledge of methods of solving higher order differential equations.

## **SEMESTER- III: CORE PAPER –V: THEORY OF REAL FUNCTIONS**

**PAPER CODE: 3331**

CO1: To exhibit the knowledge of limits and continuity, derivative.

CO2: To gain the complete knowledge of mean value theorems and its applications.

CO3: To know the concept of functions of several variables.

CO4: To know various techniques of several variables.

CO5: To study the maximum and minimum problems for only one variable.

## **SEMESTER- III: CORE PAPER –VI: GROUP THEORY - I**

**PAPER CODE: 3332**

CO1: To know the basic concepts of groups and semi groups.

CO2: To gain the knowledge of subgroups and its operations.

CO3: To study the concepts of cosets and Lagrange's theorem and normal subgroups.

CO4: To gain the Knowledge of homomorphism, Isomorphism and Automorphism of groups.

CO5: To gain the complete knowledge of permutation groups and cyclic groups.

**SEMESTER- III: CORE PAPER –VII: PDE AND SYSTEMS OF ODE**

**PAPER CODE: 3333**

CO1: To know the basic concepts of ordinary partial differential equations.

CO2: To know the various techniques of P.D.E reducible to equations with constant coefficients.

CO3: To gain the knowledge of P.D.E reduction to canonical form.

CO4: To understand the solving methods of Cauchy initial value problem for first order P.D.E

CO5: To study the concepts of mathematical physics and its methods.

**SEMESTER- IV: CORE PAPER –VIII: NUMERICAL METHODS**

**PAPER CODE: 4431**

CO1: To study the concept of errors in numerical computations and solutions of algebraic transcendental equations.

CO2: Students can understand iterative methods and its applications.

CO3: To gain the knowledge of interpolation with equal and unequal intervals and its applications.

CO4: To study the concepts of ordinary differential equations and different types of methods

CO5: To understand different types of numerical integrations rules and its applications.

**SEMESTER- IV: CORE PAPER –IX: RIEMANN INTEGRATIONS AND SERIES OF FUNCTIONS**

**PAPER CODE: 4432**

CO1: To know the basic definitions and concepts of Riemann Integration.

CO2: To know the basic definitions and concepts of uniform convergence and series of functions.

CO3: To gain the knowledge of proper and improper integrals of first kind.

CO4: To gain the knowledge of proper and improper integrals of second kind

CO5: To gain the knowledge of power series and relevant problems and applications.

**SEMESTER- IV: CORE PAPER –X: RING THEORY AND LINEAR ALGEBRA -I**

**PAPER CODE: 4433**

CO1: To know the basic definitions of rings and basic properties.

CO2: To gain the knowledge of integral domains, subrings and ideals.

CO3: To know the knowledge of ring of homomorphism.

CO4: To gain the knowledge of basic concepts of vector spaces, subspaces, basis and dimension.

CO5: To study the linear transformation and its properties.

**SEMESTER- V: CORE PAPER –XI: MULTIVARIATE CALCULUS**

**PAPER CODE: 5531**

CO1: To study the basic concepts of partial derivatives.

CO2: To know the multivariable partial derivatives and solving methods.

CO3: To gain the knowledge of double integral and its concepts.

CO4: To know the concepts of triple integral in cylindrical and spherical coordinates

CO5: To study the basic concepts of several variables of special functions.

**SEMESTER- V: CORE PAPER –XII: GROUP THEORY - II**

**PAPER CODE: 5532**

CO1: To know the basic concepts and definition of automorphism groups.

CO2: To know the basic definition and concepts of G-sets and its applications.

CO3: To gain the knowledge of conjugacy of group activity

CO4: To understand the direct product and its properties.

CO5: To gain the complete knowledge of sylow theorems on groups.

**SEMESTER- VI: CORE PAPER –XIII: METRIC SPACE AND COMPLEX ANALYSIS  
PAPER CODE: 6631**

CO1: To study basic definitions and concepts of metric space.

CO2: To understand derivatives, differentiation of analytical functions.

CO3: To study the Mobius transformation and its properties.

CO4: To gain knowledge of complex integrals and contours theorem.

CO5: To understand various theorems on power series.

**SEMESTER- VI: CORE PAPER –XIV: RING THEORY AND LINEAR ALGEBRA -II  
PAPER CODE: 6632**

CO1: To know the basic definitions and concept of polynomial rings.

CO2: To solve the various techniques of rank and system of linear equations.

CO3: To find the Eigen values and Eigen vectors by using Cayley Hamilton theorem.

CO4: To gain the knowledge of basic definitions and concepts of inner product spaces.

CO5: To gain the knowledge of orthogonality and orthonormal

**DISCIPLINE SPECIFIC ELECTIVE PAPERS FOR MATHEMATICS HONOURS**

**SEMESTER- V: DSE PAPER – I: NUMBER THEORY**

**PAPER CODE: 5533**

CO1: To gain the knowledge of Arithmetical functions.

CO2: To understand the basic knowledge of multiplicative function.

CO3: To gain the knowledge of theory of congruence's

CO4: To understand the Lagrange's theorem and application of Lagrange's theorem

CO5: To study the Quadratic residues and Quadratic non – residues

## **SEMESTER- V: DSE PAPER – II: PROBABILITY AND STATISTICS**

**PAPER CODE: 5534**

CO1: To gain knowledge of Mathematical expansions of random variable.

CO2: To know basic definitions and concept of generating functions.

CO3: To gain knowledge of distribution functions for discrete type.

CO4: To know various types of distributions for discrete type.

CO5: To gain knowledge of uniform, exponential, normal distributions for continuous type.

## **SEMESTER- VI: DSE PAPER –III: LINEAR PROGRAMMING**

**PAPER CODE: 6633**

CO1: To study the basic definitions and concepts of LPP and methods.

CO2: To gain knowledge of types of Transportation problems and its applications

CO3: To study basic definitions and concepts of solving assignment problems.

CO4: To understand the Game theory and its applications.

CO5: To know the network scheduling PERT and CPM techniques.

## **SEMESTER- VI: DSE PAPER –IV: DIFFERENTIAL GEOMETRY**

**PAPER CODE: 6634**

CO1: To gain knowledge of basic concepts of theory of space curves.

CO2: To understand the local intrinsic properties of a surface.

CO3: To gain knowledge of the Geodesic equations and Canonical equations

CO4: To study basic definitions of first and second fundamental forms of a surface.

CO5: To study developable surface and minimal surface.

## **GENERIC ELECTIVE PAPERS FOR MATHEMATICS HONOURS**

### **SEMESTER- II: GE PAPER – II: ECONOMETRIC STATISTICS**

**PAPER CODE: 2233**

CO1: To study the scope of statistics and basic concepts of statistics.

CO2: To study the diagrammatic representation of data

CO3: To study the concept of measure of central tendency

CO4: To study the concept of measure of dispersions

CO5: To study the scope of Econometrics and concept of linear models.

### **SEMESTER- III: GE PAPER – III: INFORMATION SECURITY**

**PAPER CODE: 3334**

CO1: To study the basic concepts on overview of security.

CO2: To observe the security threats and common threats.

CO3: The student can learn about the new concept of Cryptography

CO4: To gain the good knowledge on net work system and security.

CO5: To learn about good knowledge on administrating security, information and law.

### **SEMESTER- IV: GE PAPER – IV: COMBINATORIAL MATHEMATICS**

**PAPER CODE: 4434**

CO1: To study the basic definitions and concepts of counting principles, permutations and combination. .

CO2: To know the various techniques of generating functions.

CO3: To understand the scope and recurrence relations by generating functions.

CO4: To develop a Perceptions about principles of inclusion and exclusion. .

CO5: To know the basic definitions and concepts of graph theory and trees.

**DEPARTMENT OF MATHEMATICS**  
**COURSE OUTCOMES FOR UG 2018-2019**  
**B.Sc. COMPUTER SCIENCE HONOURS**

**SEMESTER- I: GE PAPER – I: ELEMENTARY MATHEMATICS**

**PAPER CODE: 1123-A**

CO1: To study definitions and basic concepts of matrix algebra

CO2: To know the knowledge of determine the adjoint, inverse and rank of matrix

CO3: To understand solving methods of linear systems in various techniques.

CO4: To gain knowledge of numerical concepts and the solution of algebraic transcendental equations.

CO5: To know about the study of finite difference and interpolation.

**SEMESTER- II: GE PAPER – II: DIFFERENTIAL EQUATIONS**

**PAPER CODE: 2223-A**

CO1: To study definitions and basic concepts of D.E and orthogonality trajectories.

CO2: To know various techniques of integrating factor.

CO3: To study various techniques of higher order linear homogeneous differential equations

CO4: To study various techniques of higher order linear non homogeneous differential equations

CO5: To gain knowledge about methods of solving higher order differential equations

**SEMESTER- III: GE PAPER – III: VECTOR CALCULUS PAPER CODE: 3324-A**

CO1: To study the concept of vector differentiations and understand the Gradient of scalar point function.

CO2: To gain knowledge in curl of vector and divergence of vectors and its applications.

CO3: To study the concept of vector identities.

CO4: To gain knowledge of vector integration and volume integral

CO5: To study the concept of Gauss divergence, Greens, Stoke's theorems and its applications.

**SEMESTER- IV: GE PAPER – IV: FUNDAMENTALS OF MATHEMATICAL STATISTICS PAPER CODE: 4424-A**

CO1: To understand basic concepts, scope and limitations of Mathematical statistics.

CO2: To study the measure of central tendency.

CO3: To study the measure of dispersion.

CO4: To gain knowledge of measure of skewness and kurtosis

CO5: To understand the concepts of measure of correlation coefficient and regression.

**SEMESTER- II: CORE PAPER – IV: DISCRETE STRUCTURES**

**PAPER CODE: 2222-A**

CO1: To study basic definitions and concepts of set theory.

CO2: To gain knowledge of concepts of Mathematical logics.

CO3: To understand the concepts of normal form and solving techniques.

CO4: To study the theory of inference for the statement calculus.

CO5: To gain knowledge of basic definitions and concepts of graph theory.

**DEPARTMENT OF MATHEMATICS**  
**COURSE OUTCOMES FOR UG 2018-2019**  
**B.Sc. FOOD TECHNOLOGY AND MANAGEMENT**

**SEMESTER- I: GE PAPER- I: APPLIED MATHEMATICS - I PAPER CODE: 1151**

CO1: To study basic definitions and concepts of sets and relations..

CO2: To study basic definitions and concepts of matrix.

CO3: To gain knowledge of solving techniques of inverse and rank of a matrix..

CO4: To determine appropriate derivative methods and differential methods of solving mathematical problems.

CO5: To understand various techniques in differential equations.

**SEMESTER- II: GE PAPER – II: APPLIED MATHEMATICS - II**

**PAPER CODE: 2254**

CO1: To study the measures of angle, ratio of trigonometric functions..

CO2: To gain knowledge of increasing and decreasing functions and also know the applications of maxima and minima of functions.

CO3: To determine various techniques of quadratic equations.

CO4: To gain knowledge of sign of quadratic equations.

CO5: To understand various techniques of some different functions.

**DEPARTMENT OF MATHEMATICS**  
**COURSE OUTCOMES FOR UG 2018-2019**  
**FOUNDATION COURSE**

**SEMESTER- IV: FOUNDATION COURSE- 8: ANALYTICAL SKILLS**

**PAPER CODE: 4401-1-A**

CO1: To learn about different types of data analysis.

CO2: To analyze questions pertaining to sequences and series analogical system..

CO3: To gain knowledge of arithmetic ability and numerical skills.

CO4: To know the concept of quantitative aptitude and its techniques.

CO5: To know the concept of business computations techniques.

**DEPARTMENT OF MATHEMATICS**

**M.Sc. MATHEMATICS**

**SEMESTER- I: PAPER I - ALGEBRA**

**PAPER CODE: 10101**

CO1: To understand the basic concepts of G-sets and finite Abelian groups

CO2: To understand the basic concepts of ideals and homomorphism.

CO3: To gain the knowledge of Integrals domain and its applications

CO4: To study the basic concepts of Modules and its applications.

**SEMESTER- I: PAPER II - REAL ANALYSIS**

**PAPER CODE: 10102**

CO1: To understand the basic concepts of the Topological space.

CO2: Students identify the difference between the Riemann integral and Riemann Stieltjes integral.

CO3: To analyze the arithmetic sequences and series to solve the problems.

CO4: knowledgeable students will able to solve the proper and improper integrals

**SEMESTER- I: PAPER III – ORDINARY DIFFERENTIAL EQUATIONS**

**PAPER CODE: 10103**

CO1: To gain the problem solving Knowledge of Oscillating theory and boundary value problems.

CO2: To study order equations of power series and ordinary points.

CO3: To know some special functions of Mathematical physics

CO4: To understand the existence, uniqueness solutions of Picard's theorem.

**SEMESTER- I: PAPER IV - NUMERICAL METHODS AND C - PROGRAMMING**

**PAPER CODE: 10104**

CO1: To study the concepts of interpolation with cubic spline.

CO2: To know various techniques of numerical solutions of ordinary differential equations.

CO3: To study the basic concepts, definitions and over view of C

CO4: To understand the strings, functions, structure and pointers of C-Programming.

**SEMESTER- I: PAPER V – COMPLEX ANALYSIS**

**PAPER CODE: 10105**

CO1: To understand the basic introduction to the complex numbers and also Analytic functions

CO2: To understand the Mobius transformation and also how to solve different types of Mobius transformation problems.

CO3: To study the Cauchy integral theorem and their problems in Complex integral

CO4: To understand the solution for different types of power series problems

**SEMESTER-II: PAPER VI - DISCRETE MATHEMATICS**

**PAPER CODE: 20101**

CO1: To understand how to solve the problems by using the mathematical logics for the statements

CO2: To study the various methods of predicate calculus.

CO3: To understand both lattices and Boolean algebra.

CO4: The students will be able to apply principles and concepts of graph theory in practical situations.

**SEMESTER-II: PAPER- VII - MEASURE AND INTEGRATION**

**PAPER CODE: 20102**

CO1: Students can understand the basic concepts of sets and relations.

CO2: The students understand the difference between the measure and outer measure in the measure theory

CO3: Students can identify the Lévesque integral is extended to the Riemann Integral

CO4: To learn the differentiation and integration.

### **SEMESTER-II: PAPER- VIII – PARTIAL DIFFERENTIAL EQUATIONS**

**PAPER CODE: 20103**

CO1: To understand the orthogonal trajectories and the pfaffian differential equations.

CO2: Students can learn first order partial differential equations

CO3: To understand the canonical forms of the second order partial differential equations

CO4: To understand the Laplace equations and also understand the boundary value problems.

### **SEMESTER- II: PAPER IX - TOPOLOGY**

**PAPER CODE: 20104**

CO1: To know the basic concepts of set theory and its logics.

CO2: To gain knowledge of Topology, Basis and types of Topologies

CO3: To understand the concepts of connectedness, compactness.

CO4: To get the basic knowledge of countability and separation of axioms.

### **SEMESTER-I I: PAPER X – ADVANCED COMPLEX ANALYSIS**

**PAPER CODE: 20105**

CO1: To gain knowledge of Laurent series and to solve the singular point problems.

CO2: To study residue theorems and its applications.

CO3: To know the concepts of Harmonic functions and conformal mapping.

CO4: To understand the infinite product and partial fractions expansions.

### **SEMESTER- III: PAPER XI – COMMUTATIVE ALGEBRA PAPER CODE: 30101**

CO1: To know the basic concepts of ideals, modules and homomorphism.

CO2: To understand the concept of finite condition series.

CO3: To study the basic definitions of Noetherian rings and Hilbert basis theorem

CO4: To understand the Lasker – Noetherian decomposition theorem and applications of zero divisors, Nil potent elements.

**SEMESTER -III: PAPER XII – FUNCTIONAL ANALYSIS      PAPER CODE: 30102**

CO1: To understand basic concepts of Vector space and Normed linear space.

CO2: To get Knowledge of Natural imbedding theorems and open mapping theorem.

CO3: To understand the basic concepts of Hilbert spaces.

CO4: To study self adjoint operators and finite dimensional spectral theory.

**SEMESTER -III: PAPER XIII - DIFFERENTIAL GEOMETRY    PAPER CODE: 30103**

CO1: To Explain about the basic concepts of space curves and different types of planes

CO2: Students can understand the parametric equation of a surface and local intrinsic properties of a surface.

CO3: Students can identify the solution of local intrinsic and non intrinsic properties of a surface

CO4: To Explain about the Geodesic equations and canonical geodesic equations.

**SEMESTER-III: PAPER- XIV: NUMBER THEORY                      PAPER CODE: 30104**

CO1: To Study the properties of positive numbers and different types of Arithmetical functions

CO2: To Explain the Average of Arithmetical functions.

CO3: To understand the foundations of theory of congruence's.

CO4: To Explain the Quadratic residues and Quadratic non – residues and different functions of Quadratic reciprocity laws.

**SEMESTER-III: PAPER- XIV: CLASSICAL MECHANICS**

**PAPER CODE: 30105**

CO1: To analyze the concept of Mathematical physics, D'Alembert's principle and Lagrange's equations

CO2: To understand the variation principle and Lagrange's equations, non - halonomic system

CO3: To gain knowledge of Hamilton equations of motion by using the Lagrange's equations

CO4: To know the solutions for canonical transformations problems, Poisson's brackets and Jacobi theory.

**SEMESTER-IV: PAPER XV - GALOIS THEORY**

**PAPER CODE: 40101**

CO1: Students can understand the basic concepts of polynomials and ring polynomials and their properties and the extension field.

CO2: To study the difference between normal and separable extensions.

CO3: To learn Galois Theory

CO4: Students can identify the applications of Galois Theory to the classical problems.

**SEMESTER-IV: PAPER XVII - OPERATIONS RESEARCH**

**PAPER CODE: 40102**

CO1: To Understand different types of problems in Linear programming..

CO2: Students will know how to run many companies to get more property by using "Scientific inventory management".

CO3: To solve problems by using the dynamic programming.

CO4: To learn basics and characteristics of Game theory.

**SEMESTER- IV: PAPER XVIII – GRAPH THEORY**

**PAPER CODE: 40103**

CO1: To know basic definitions and concept of Graphs and sub graphs.

CO2: To gain knowledge of trees and its applications

CO3: To understand connectivity graphs and its applications.

CO4: To understand the Euler tour Hamiltonian cycles and its applications

**SEMESTER-IV: PAPER XIX- BANACH ALGEBRA PAPER CODE: 40104**

CO1: To identify the liner space and Ideals and understand the spectral radius formula

CO2: To study the Gelfand mapping and Gelfand neumark theorems,

CO3: To understand the compact Hausdorff space and its knowledge to apply on theorems

CO4: To study the basic concepts of Boolean algebra, Boolean rings and Picard's theorem.

**SEMESTER- IV: PAPER XX – MATHEMATICAL STATISTICS**

**PAPER CODE: 40105**

CO1: To know the basic concept and definitions of the probability set function.

CO2: To gain knowledge of distribution of functions and sampling theory

CO3: To study various distributions.

CO4: To gain knowledge of point estimations, confidence intervals and relevant theorems.

## **Course Out Comes**

### **Physics (U.G.)**

#### **Title of the Paper-(W.M) Mechanics and properties of matter**

#### **Out Comes**

##### **Semester-I**

CO-I Define gradient, divergence and curl and express their respective forms in rectangular coordinate systems.

CO-II Describe the principle of motion of a rocket calculate the thrust on a rocket

CO-III Applications of basic concepts of mechanics to rigid bodies Euler's equations and its applications to gyroscope in navigation.

CO-IV Derivation of keplar's laws motion of a satellites idea of global positioning system (GPS)

CO-V Describe Michelson-Morley experiment with relevant theory and discuss importance of its result.

##### **Practical's -I**

CO-I Viscosity of liquid by the flow method .

CO-II Study of oscillations under bifilar suspension the filament are parallel momentum of inertia of cylindrical rod.

CO-III Use the theoretically knowledge of torsion pendulum and measure rigidity modulus of material of a wire.

CO-IV Determination of momentum of inertia using fly wheel.

CO-V Young's modulus of the material a bar (scale) by non- uniform bending.

##### **Course Out Comes**

#### **Title of the Paper-(W.M)Waves and oscillations**

## **Semester-II**

CO-I Combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies.

CO-II Discuss the conditions under which the oscillations are said to be in different damping conditions.

CO-III Analyze periodic wave functions by applying Fourier theorem.

CO-IV Modes of vibration stretched string in different clamping conditions, overtones and harmonics.

CO-V Productions and applications of ultrasonic's.

### **Practical's -II**

CO-I Volume resonator- determination of frequency of a tuning fork.

CO-II Study of a compound pendulum-determination of g and k.

CO-III Measurement of errors – simple pendulum.

CO-IV To determine the velocity of transverse waves along a stretched string using a sonometer.

CO-V Determination of the force constant of a spring by static and dynamic method.

## **Title of the Paper-(W.M) Wave optics**

### **Semester-III**

CO-I Different types of aberrations and their minimization in lenses .

CO-II Principle of super position, coherence, interference phenomena and with applications to Newton rings and Michelson interferometer

CO-III Fraunhoffer diffraction pattern with single, double and N slits. Fresnel half period zones

CO-IV Polarization methods ,Nicol prism as polarization & Analyzer –optical Activity

CO-V Different types of lasers and fibers their applications principle of Holography and its applications

## **Title of the Paper-(W.M) Thermodynamics and Radiation physics**

### **Semester-IV**

CO-I Explain the kinetic theory of gases and various transport phenomena

CO-II Isothermal and adiabatic process reversible and irreversible process efficiency Carnot engine-concepts of entropy

CO-III Thermodynamic potentials obtain Maxwell's equations in Thermodynamics.

CO-IV Describe the Joule Thomson expression the low temperature application of low temperatures

CO-V Measurement of radiation –types of pyrometers

## **Title of the Paper-(N.M) Mechanics and properties of matter**

### **Semester-I**

CO-I Define scalars and vectors –vectors addition- scalars and vectors products

CO-II Collisions –Elastic and inelastic collisions, Impact parameter, Scattering Cross section

CO-III Rigid body –moment of inertia in simple cases Elementary ideas about gyroscope motion ,precession of the equinoxes

CO-IV Central forces and its characteristics keplar's laws

CO-V Bernoulli's equation and its applications. Special theory of relativity and its postulates

CO- IV Determination of momentum of inertia using fly wheel.

CO-V Young's modulus of the material a bar (scale) by non- uniform bending.

## **Title of the Paper-(N.M)Waves and oscillations**

### **Semester-II**

CO-I Combination of two mutually perpendicular simple harmonic vibrations of same frequency and different frequencies.

CO-II Damped vibrations and forced vibrations its explanations & examples

CO-III Sonometer verification of laws of transverse vibrations in a stretched string .

CO-IV Classifications of sound and its characteristics.

CO-V Productions and applications of ultrasonic's.

Practical's -II

CO-I Volume resonator- determination of frequency of a tuning fork.

CO-II Study of a compound pendulum-determination of g and k.

CO-III Measurement of errors – simple pendulum.

CO-IV To determine the velocity of transverse waves along a stretched string using a sonometer.

CO-V Determination of the force constant of a spring by static and dynamic method.

### **Title of the Paper-(N.M)Wave optics**

**Semester-III**

CO-I Different types of aberrations and their minimization in lenses .

CO-II Principle of super position and with applications to Newton rings and Michelson interferometer

CO-III Fraunhofer diffraction pattern with single, double and N slits. Fresnel half period zones

CO-IV Polarization methods ,Nicol prism as polarization & Analyzer –optical Activity

CO-V Different types of fibers their applications principle of Holography and its applications

### **Course Out Comes**

### **Title of the Paper-(N.M)Thermodynamics and Radiation physics**

Semester-IV

CO-I Explain the kinetic theory of gases and Zeroth law of thermodynamics.

CO-II Isothermal and adiabatic process reversible and irreversible process efficiency Carnot engine-concepts of entropy

CO-III Describe the Joule Thomson expression the low temperature

CO-IV Measurement of radiation –types of pyrometers.

CO-V Seebeck effect variation of thermo- emf with temperature. Peltier effect, demonstration peltier coefficient.

### **Title of the Paper-(W.M)Electricity, Magnetism& Electronics**

#### **Semester-V**

CO-I Gauss's law statement and its proof-electric displacement D, electric polarization P – relation between D, E& P.

CO-II Biot-savart law, Explanation and calculation of B due to long straight wire-Hall effect, faradays law –lenz law self and mutual inductance.

CO-III Relation between current and voltage in LR and CR circuits. LCR series and parallel resonance circuit-Maxwell's equations.

CO-IV I-V Characteristics of P-N junction diode, zenar diode, Tunnel diode. CB, CE& CC Configurations.

CO-V State and prove the Boolean algebra, Demorgan's laws and verify the universal gates

### **Title of the Paper-(W.M)Modern physics**

#### **Semester-V**

CO-I Idea about atomic structure-vector atom model. Molecular spectroscopy a related to Raman effect.

CO-II Dual nature of matter and waves idea about uncertainty principle.

CO-III Introduction to quantum mechanics. Applications of Schrodinger wave equation to particle in a box.

CO-IV Properties of nuclear and nuclear models theory of  $\alpha$  –decay and  $\beta$ - decay.

CO-V Introduction to X-ray diffraction and laue's and powder method basic idea of super conductivity and their applications

### **Title of the Paper-(N.M)Electricity, Magnetism& Electronics**

#### **Semester-V**

CO-I Gauss's law statement and its proof Applications of gauss law

CO-II electric displacement D, electric polarization P, permeability& Susceptibility–relation between D, E& P..

CO-III Drift velocity expression, Kirchhoff's laws –statement and explanation and application to Wheatstone bridge

CO-IV Theory and working of a moving coil ballistic galvanometer, application of B.G damping correction

CO-V State and prove the Demorgan's laws and verify the universal gates

course Out Comes

## **Title of the Paper-(N.M)Modern physics& Medical physics**

### **Semester-V**

CO-I Idea about atomic structure- spectroscopy a related to Raman effect, Zeeman effect

CO-II Theory of Compton effect and its experimental verification-Bohr's theory hydrogen atom

CO-III Properties of matter waves Davison and Germer experiment on electron diffraction

CO-IV Half life and mean life periods –derivations , units of radio activity , carbon and uranium dating

CO-V Introduction to X-ray diffraction and Laue's and powder method basic idea of super conductivity and their applications.

### **Practical's -VI**

CO-I Determination of specific charge of electron

CO-II Determination of magnetic moment of bar magnet and horizontal component of earth magnetic field.

CO-III Energy gap of semiconductor using junction diode

CO-IV Energy gap of semiconductor using Thermister

CO-V Determination of planks constant.

**Title of the Paper-(W.M&N.M)Analog & Digital electronics**

**Semester-VI**

CO-I Apply the knowledge of basics of FET and MOSFET in understanding their characteristics.

CO-II Characteristics of ideal and practical OP-AMP (IC-741) and its parameters

CO-III Applications of OP-AMP and different types of amplifiers.

CO-IV Characteristics of digital ICS –RTL,DTL,TTL etc. And its pin diagram

CO-V Apply the knowledge of JK flip flop RS flip flop ,D flip flop.

**Title of the Paper-(W.M)Electronic Instrumentation**

**Semester-VI**

CO-I To learn about the basic concepts on electronic measurements and instruments .

CO-II To study the electronic voltmeter parameters , measurements and their significance.

CO-III The student can learn about the CRO functioning and application .

CO-IV To gain good knowledge on digital multimeter and digital instruments.

CO-V To learn about the good knowledge on single generator and bridge.

**Title of the Paper-(W.M)Computational Methods and programming**

**semester-VI**

CO-I To acquire the knowledge on fundamental concepts of  
c-programming .

CO-II To develop programs by using control statements in C-language

CO-III To apply the Arrays and functions of C-language.

CO-IV To gain the knowledge of linear and non –linear equations .

CO-V To understand the basic definitions and concepts of interpolations, numerical differentiation and integration.

**Title of the Paper-(W.M)Introduction to Microprocessors and Microcontroller**

**Semester-VI**

CO-I To understand architecture of 8085 Microprocessor .

CO-II To learn various 8085 in instruction set and interrupts.

CO-III To learn Microcontrollers, embedded systems design, development and its product life cycle.

CO-IV To understand architecture of 8085 Microcontrollers, timers& interrupts

CO-V To have clear idea about 8051 I/O programming.

**COURSE OUT COMES**

**PG**

**SEM-I**

**COURSE CODE: PHY 10201-A**

**COURSE TITLE: PHY-CLASSICAL MECHANICS AND THEORY OF RELATIVITY**

**CO1:** Understand and derive the Lagrangian & Hamiltonian mechanics and its applications.

**CO2:** Analyze the canonical transformations and understanding the Hamilton- Jacobi theory.

**CO3:** Apply the knowledge of basics conditions for closed orbits and rigid body dynamics

**CO4:** Understand and analyze the postulates of special theory of relativity and its applications.

**COURSE CODE: PHY 10202-A**

**COURSE TITLE: PHY-ATOMIC AND MOLECULAR PHYSICS**

**CO1:** Knowledge for the hydrogen atom, three quantum numbers, alkali elements, selection rule and coupling schemes of atomic spectra.

**CO2:** To explain the Zeeman, stark and paschen-back effects.

**CO3:** Knowledge for the different types of diatomic molecules and its applications of rotational energies.

**CO4:** Knowledge for the different types of diatomic molecules and its applications of vibrational spectra.

**COURSE CODE: PHY 10203-A**

**COURSE TITLE: PHY-SOLID STATE PHYSICS**

**CO1:** Explain the origin of chemical bonding in ionic and Vander Waals crystals, elastic properties and quantization of lattice energies and vibrations.

**CO2:** Explain the matheissens rule and relaxation time approximation of transport phenomena and band theory.

**CO3:** Explain the types of semiconductors, Hall Effect and determination of life time diffusion length of minority charge carriers.

**CO4:** To Understanding the concept of zero resistance, differs between the perfect conductors and super conductors and its applications.

**COURSE CODE: PHY 10204-A**

**COURSE TITLE: PHY-ANALOG AND DIGITAL ELECTRONICS**

**CO1:** Apply the knowledge of basics of FET and MOSFET in understanding their characteristics.

**CO2:** Uses the basics of operational amplifier to understand its practical applications in electronic circuits.

**CO3:** Implement simple logic operations using combinational logic circuits and understand the working of sequential logic circuits like as RS ff, JK ff and D ff etc.

**CO4:** Understand and analyze the internal operation of 8086 microprocessor.

## **COURSE OUTCOMES**

### **SEM-II**

**COURSE CODE: PHY 20201-A**

**COURSE TITLE: PHY-STATISTICAL MECHANICS**

**CO1:** To understand the Types of ensembles and comparison of various ensembles.

**CO2:** Analyze the canonical partition function, Vibrational partition function and their Applications.

**CO3:** To gain the knowledge of Maxwell-Boltzmann distribution and Two fluid model.

**CO4:** Explain the Fermi-Dirac distribution and one dimensional random walk.

**COURSE CODE: PHY 20202-A**

**COURSE TITLE: PHY-ELECTROMAGNETIC THEORY, LASERS AND MODERN OPTICS**

**CO1:** To Analyze the Maxwell's equations and Retarded potentials.

**CO2:** Understand the different types of lasers, Basic principles and their Applications.

**CO3:** To explain the Basic theory of Holography and Two dimensional Fourier transforms.

**CO4:** To learn the Total internal reflection and Applications of optical fibers in communication and medicine.

**COURSE CODE: PHY 20203-A**

**COURSE TITLE: PHY- MATHEMATICAL PHYSICS**

**CO1:** To explain the Beta and Gamma functions and Legendre, Bessel and Hermit differential equations and their Recurrence relations.

**CO2:** To gain the knowledge of Fourier Transforms and Laplace Transforms.

**CO3:** To understand the Laplace equations and thermal expansion.

**CO4:** To learn the Cauchy-Riemann equations and Residue theorem.

**COURSE CODE: PHY 20204-A**

**COURSE TITLE: PHY-COMPUTATIONAL METHODS AND C- PROGRAMING**

**CO1:** To explain the creating & editing Document, Worksheet and Presentation.

**CO2:** To understand the data types Controlling statements and Arrays.

**CO3:** learn the Bisection, Gauss elimination method and their Algorithms.

**CO4:** To gain the linear interpolation, Numerical differentiation and fourth order Runge-kutta Method.

## **COURSE OUTCOMES**

### **SEM-III**

**COURSE CODE: PHY 30201**

**COURSE TITLE: PHY-QUANTUM MECHANICS -I**

**CO1:** Learn the postulates of Quantum mechanics and derive the Eigen values and Eigen function of barrier & well and explain the operators, bra –Ket notation and its properties.

**CO2:** Explain the angular momentum and their Eigen values, Eigen functions & C-G coefficients.

**CO3:** Understand and analyzed the time dependent & time independent perturbation theory for generate and degenerate levels.

**CO4:** Analyze the scattering theory, partial wave analysis, born approximation and its validity condition.

**COURSE CODE: PHY 30202**

**COURSE TITLE: PHY-NUCLEAR AND PARTICLE PHYSICS**

**CO1:** To understand & analyze the nuclear forces and models.

**CO2:** To explain the types of nuclear reactions, nuclear decays and its selection rules.

**CO3:** Understand the types of nuclear accelerators and reactors.

**CO4:** Apply the knowledge of basis of elementary particles, types and their properties.

**COURSE CODE: PHY 30203**

**COURSE TITLE: PHY- PHYSICS OF SEMICONDUCTOR DEVICES**

**CO1:** To understand the I-V characteristics of junctions like as P-N & Interfaces like as metal-semiconductor.

**CO2:** To explain the junction diodes like as majority carrier diodes, microwave devices & optoelectronic devices.

**CO3:** Apply the knowledge of basis of BJT, FET, and MOSFET & CCD.

**CO4:** To explain the power rectifiers, thyristors and technology of semiconductor devices.

**COURSE CODE: PHY 30204**

**COURSE TITLE: PHY-CONDENSED MATTER PHYSICS-I**

**CO1:** To understand the imperfection in crystals and classifications.

**CO2:** To explain the classification, properties and applications of Ferro electrics and Ferromagnetism.

**CO3:** Understand the crystal growth and characterization.

**CO4:** To explain the fluorescence and phosphorescence and its applications.

## **COURSE OUT COMES**

### **SEM-IV**

**COURSE CODE: PHY 40201**

**COURSE TITLE: PHY- QUANTUM MECHANICS -II**

**CO1:** To understand the different types of pictures and Poisson and commutation brackets their properties.

**CO2:** To explain the identical particles and molecules.

**CO3:** To explain the Klein –Gorden equation, probability, inadequacies of K.G equation.

**CO4:** Understand and analyze the method of canonical quantization, second quantization and N-representation system.

**COURSE CODE: PHY 40202**

**COURSE TITLE: PHY-ANALYTICAL TECHNIQUES**

**CO1:** To gain the knowledge of diffraction methods for structure analysis.

**CO2:** To explain the electron spin resonance spectroscopy and analyze the Mossbauer spectrum.

**CO3:** To understand the theory of NMR and basic concepts of NQR spectra.

**CO4:** To gain the knowledge of instrumentation and applications of photoelectron spectroscopy and scanning electron microscopy.

**COURSE CODE: PHY 40203**

**COURSE TITLE: PHY-ADVANCES IN PHYSICS**

**CO1:** Understand the emergence of nanotechnology and analyze the physical vapour deposition.

**CO2:** Analyze the basic structure and applications of MEMS and nanodevices.

**CO3:** To gain the knowledge of 8051 micro controllers and single-bit instructions.

**CO4:** To analyze the electromagnetic spectrum and applications of remote sensing.

**COURSE CODE: PHY 40204**

**COURSE TITLE: PHY- CONDENSED MATTER PHYSICS-II**

**CO1:** Analysis of stress and strain tensors and Elastic waves in cubic crystals.

**CO2:** To explain the properties of phonons and experimental study of dispersion curves.

**CO3:** To Understand the energy band calculations and construction and characteristics of Fermi surface.

**CO4:** To Understand the classification of amorphous semiconductors and liquid crystals and polymers their applications.

## **POLITICAL SCIENCE**

### **Course Outcomes : (COs)**

#### **Semester -I**

##### **Title of the paper: BASIC CONCEPTS OF POLITICAL SCIENCE.**

- CO1:** To know about the nature and scope of Political Science.
- CO2 :** To understand the analyzation of the origin and evaluation of the Modern State.
- CO3:** To identify the difference between the terms Nation & Nationality.
- CO4:** To evaluate civil and social rights and their importance in the civil society.
- CO5:** To compare and understand differences between freedom, equality& justice

#### **Semester- II**

##### **Title of the Paper: POLITICAL INSTITUTIONS – CONCEPTS, THEORY’S AND INSTITUTIONS.**

- CO1:**To understand the basic features of federal form of government and unitary form of government.
- CO2:** To understand the basic features of classical and modern democracy.
- CO3:**To know the nature, role and functions of judicial review.
- CO4:**To understand structural form of the modern state, basic features of parliamentary and presidential form of government.
- CO5:**To analyse the purpose of constitutional law and separation of power.

#### **Semester - III**

##### **Title of the Paper: INDIAN CONSTITUTION.**

- CO1:** To know about the ideology of the Indian national movement on constituent assembly.
- CO2:** To understand preamble and salient features of the Indian constitution.
- CO3:** To acquire both knowledge and difference between fundamental rights and directive principles.
- CO4:** To acquire knowledge on unitary and federal features of the Indian constitution.
- CO5:**To analyse the values of the Indian constitution and the role of higher judiciary in India.

## **Semester -IV**

### **Title of the paper: INDIAN POLITICAL PROCESS.**

**CO1:** To understand the theory of modernization and analysis of the transition from traditions to modernity and capitalism.

**CO2:** To know the transition of Indian caste system from hierarchy and to identify the role of assembly.

**CO3:** To understand and analyze the community and to know the role of the state towards religion.

**CO4:** To describe the electoral trends of the Lok Sabha from 1952 to 2014 from the one party system to multiparty coalitions and determinants of voting behavior in India.

**CO5:** To explain the evolution of party system in India, the bases of major political parties like : INC, BJP, CPM, CPI, DMK, BSP, TDP, AIADMK, etc.

## **Semester-V-Paper-V**

### **Title of the paper: INDIAN POLITICAL THOUGHT.**

**CO1:** To know about the traditions of Ancient Indian Political Thought revealed by great thinkers Manu & Kautilya.

**CO2:** To know the great works of Raja Rammohan Roy on religious and social reforms.

**CO3:** To understand the drain theory and poverty theory of Dadabai Naoroji.

**CO4:** To know the concepts of the Hindu culture nationalism and communitarian.

**CO5:** To analyze the concepts of democratic egalitarianism of Gandhi, Jawaharlal Nehru, Dr. B. R. Ambedkar and M.N. Roy.

## **Semester – V-Paper-VI**

### **Title of the Paper: WESTERN POLITICAL THOUGHT.**

**CO1:** To identify political ideologies, concepts and ideas.

**CO2:** To know and understand the early medieval beginning of modern thought revealed by S.T. Augustine and Machiavelli.

**CO3:** To understand the liberal thoughts of Thomas & J.S. Mill. J.J. Rousseau.

**CO4:** To understand democracy thought of Jeremy Bentham and J.S. Mill.

**CO5:** To understand the political idealism and its critique revealed by Hegel and Karl Marx.

### **Semester – VI-Paper-VII**

#### **Title of the Paper: PRINCIPLES OF PUBLIC ADMINISTRATION.**

**CO1:** To identify the structure of Administration.

**CO2:** To acquire knowledge about the theories and basic principles of different Administration theories.

**CO3:** To get knowledge about the principles of Organization.

**CO4:** For getting ability to Compare different organizational structures in public and private administration and assess the emergence of modern administrative state in 20<sup>th</sup> century.

**CO5:** To summarize public administration as a potential career field in government sector.

### **Semester – VI-Paper-VIII ( CL – I )**

#### **Title of the Paper: INTERNATIONAL RELATIONS.**

**CO1:** To identify the structure of basic concepts of International Relations.

**CO2:** To know about the study Approaches of International Relations.

**CO3:** To get knowledge about the 1<sup>st</sup> and 2<sup>nd</sup> world wars ( 1914 – 1945 ).

**CO4:** To understand the origins of 1<sup>st</sup> cold war and end of 2<sup>nd</sup> cold war.

**CO5:** To get knowledge about the role of UNO in the protection of International peace and problems of the 3<sup>rd</sup> world , struggle for New international economic order.

### **Semester – VI – Paper – VIII ( CL -2 )**

#### **Title of the Paper : INDIAN FOREIGN POLICY.**

**CO1:** To understand about “ what is foreign policy , continuity and change in Indian foreign policy”.

**CO2:** To know about the Non-Alignment ,the role of India in the UNO in protection of International Peace.

**CO3:** Knowledge about the India's relation with USA and China, during the period of cold war.

**CO4:** To compare India - Pakistan relations and India's role in SAARC.

**Semester – VI – Paper - VIII ( CL -3 )**

**Title of the paper : CONTEMPORARY GLOBAL ISSUES.**

**CO1:** To get knowledge about conceptions of Economical , Political , Environmental , Cultural Globalization.

**CO2:** To know the Anchors of Global Political Economy-IMF & WTO nature, role and functions.

**CO3:** Knowledge about the role of Nation, State in the context of Globalization.

**CO4:** To get knowledge about the Concepts of Contemporary Global Issues -- Ecological Issues and present state of the International Terrorism.

**STATISTICS**  
**course outcomes**  
**Semester –I**

**Paper title : Descriptive statistics and probability  
paper –I**

**paper code: 1115- A**

- Co1: To understand the scope of statistics , basic concepts of statistics and how to construct the graphical and diagrammatic representation of data, measures of central tendency .
- Co2 : To understand measures of dispersion and importance of skewness and kurtosis.
- Co3: To gain the knowledge of probability and it's applications in real world .
- Co4: To Study the conditional probability and how to apply theorems by solving problems.
- Co5: To study the random variables , Bi- Variate random variables and it's applications .

**Semester -II**

**Paper title : Mathematical Expectations and probability distribution  
paper –II**

**paper code : 2215- A**

- Co1: To gain the knowledge of mathematical Expectations and concept of generating functions .
- Co2: To study the Binomial and Poisson's distributions .
- Co3: To easily understand negative Binomial and Hyper geometric distributions and their interrelationship.
- Co4: To gain practical knowledge of continuous distribution like Exponential and Gamma.
- Co5: To study the normal distribution and its importance , its applications and also limiting cases of binomial ,Poisson tends to normal distributions

**Semester -III**

**Paper title : Statistical Methods  
paper –III**

**paper code: 3315- A**

- Co1: To Study how to construct principle of least square to fit a different types of curves.
- Co2: To know the basic definitions, methods of measures of correlation coefficient.
- Co3: To learn concept of regression analysis and difference between correlation and regression.
- Co4: To understand classification attributes easily .
- Co5: To learn basic concepts of Exact sampling distribution.

**Semester -IV**

**Paper title : Statistical Inference  
paper –IV**

**paper code: 4415- A**

- Co1: To understand how to analyze data and estimate the parameters .
- Co2: To study how to draw conclusions about populations by Examining a sample of population as used in medicine & healthcare.

- Co3: To learn small and large sample test in different situations .  
Co4: To understand non- parametric test and its applications.

### **Semester -V**

#### **Paper title : Sampling Techniques and Design of Experiments**

**paper –V**

**paper code : 55151**

- Co1: To understand how to prepare a Questionnaire and conduct a survey .  
Co2: To understand how to apply sampling techniques methods .  
Co3: To able to learn how to test the difference between two or more means .  
Co4: To understand to Missing plot Technique.  
Co5: To understand reduce Experimental error when compared with RBD.

#### **Paper title : Statistical Quality control and Reliability**

**paper –VI**

**paper code : 55152**

- Co1: Students willable to maintain a quality by understanding Industry and  
Construction of control charts for variables .  
Co2: To Understand construction of attributes charts .  
Co3: To Study how to accept a sample of product in a market and which type of  
Risks face by producers and consumers .  
Co4: To study the concept of Reliability and it's applications .  
Co5: To understand system of Reliability.

### **Semester -VI**

#### **Paper title : Applied Statistics**

**paper –VII**

**paper code : 615EL01**

- Co1: To Study how to estimate the future trend values in business purpose .  
Co2: To Understand how to assess the purchasing power of money , for adjusting  
National Income ..etc.  
Co3: To Gain the Knowledge of Official Statistics .  
Co4: To Gain the knowledge of calculation of Birth and death rates in real world  
Co5: To understand construction of life table in real life .



## U.G. Telugu

### COURSE OUTCOMES

#### SEMESTER – I

**CO1:**

- To know the impact of Ancient literature values and the traditional issues.
- Understand the status of women strategy in Vedic period.

**CO2:**

- Inculcate the personality of modern women
- Understanding the modern concepts of “abyudhaya kavithvam”

**CO3:**

- Understanding fiction writing
- To Realize the values lying the human lives

**CO4:**

- To acquire knowledge of ancient and modern grammar in telugu
- To understand telugu vakyavisheshalu

**SEMESTER – II****CO1:**

- To understand the relation between god and nature and realize the value of belief, which leads to success
- Ancient significances of marriage system in India
- To know how to solve the problem

**CO2:**

- Ecological awareness, which is essential for human lives and natural resources like water, plants etc...
- Awareness about nature behavior

**CO3:**

Brining awareness in storytelling. Encouraging the views of students.

**CO4:**

To study about endangered arts

**SEMESTER – III****CO1:**

- To know the value of giving nature, that hikes the personality
- To Bringing the awareness on greediness
- Pride should not go ahead

**CO2:**

- To Bringing a view on original literature
- To Bringing the awareness on festivals and culture
- Morality in human beings

**CO3:**

- Importance of telugu language
- Importance of personality development, attitude, action, belief and behavior

**CO4:**

- To study Sanskrit literature like chandassu, alankaraalu.

**B.A (HONOURS) OUTCOMES**  
**SEM – I**

**COURSE – I**

**TITLE OF THE PAPER: HISTORY OF TELUGU LANGUAGE**

- The aim of this paper is to furnish a comprehensive account to the origin and development of Telugu language.
- To know the difference between ancient and modern Telugu language.
- To create awareness on the origin and history of Telugu language to the students.
- Students have mastery on history of Telugu language.
- In this unit students learn about Telugu Dialects.

**COURSE – II**

**TITLE OF THE PAPER: LANGUAGE VARIETIES**

- To learn the standards and the origin of Telugu language.
- Students know about folk lore and they learn about definition and qualities of folk songs.
- They learn the origin of formal, informal and textual language.
- To introduce ancient history of genre.
- The development of origin of modern poetry.

**COURSE – III**

**TITLE OF THE PAPER: HISTORY OF ANDHRA CULTURE**

- To know history of ancient Andhra Pradesh.
- To make them understand about the dynasties.
- To know about utopian ruling, business, religion, literature and their arts.
- In this unit students learn about society and modernization.
- To bring awareness on the formation of Andhra and Telangana and its culture and politics.

**SEM – II**

**COURSE – I**

**TITLE OF THE PAPER: GRAMMAR**

- The aim of this unit is to know the root words and preposition.
- To understand the formation of words.
- To make students learn about parts of speech.
- In this unit students know about singular, plural and genders.
- The purpose and structure of the sentence.

**COURSE – II**

**TITLE OF THE PAPER: TELUGU LITERATURE**

- The aim of this unit to introduce pothana's life, works, styles and devotion in Bhagavatham.
- To know the lives of about Kshethraiah , Thyagaiah , Annamaiah and Ramada's.
- To know about the historical facts of Dhakshinandra.
- To know about the lives of Madhuravani, Ramabadrabha, Ranganayakamma and Muddupalani
- To know the proses of Vemana Sathakam.

**COURSE – III**

**TITLE OF THE PAPER: TELUGU LITERATURE-GENRE**

- To introduce the preface of the drama.
- This unit aims at the prose's of drama.
- In This unit students learn about different feelings in rasa.

- To create awareness about Poems, Novel, Short.
- This unit aims at the Biography, Literary Criticism and Pilgrimage.

### SEM – III

#### **COURSE – I**

##### **TITLE OF THE PAPER: FOLK LITERATURE**

- The aim of this unit is to make the students know about the definition, rites and rituals and folk arts.
- In this unit students learn about different types of folk songs.
- In this unit students learn about story type folk songs.
- To enhance the moral values of the students through different type of folk tales.
- The concept of this unit is to in from the students about the folk works of the western and Indian authors.

#### **COURSE – ii**

##### **TITLE OF THE PAPER: FOLK PERFORMING ARTS**

- In this unit students learn the divisions and uses of folk lore.
- Students learn about origin, definition qualities and uses of puzzles.
- This unit Introduces folk and performing arts.(music, dance etc)
- The theme of this unit is to explain culture, idol worship and rituals of folk lore.
- This unit introduces different types of folk festivals.

#### **COURSE – iii**

##### **TITLE OF THE PAPER: CRITISISM**

- In this unit students learn about fine arts.(drawing and painting etc)
- This unit aims at definition of Kavya and also teaches moral values.
- To make the students Identify Language, Grammar and morality in poetry.
- This unit focuses on origin of different type of poetry.
- In this unit students learn about tragedy, Aristotle and Shakespeare

### SEM – IV

#### **COURSE – I**

##### **TITLE OF THE PAPER: HISTORY OF TELUGU LITERATURE (ANCIENT TO MEDIEVAL)**

- This unit explains the structure.
- This unit highlights the life history, way of Translations, Qualities of poetry, other works and contemporaries of Nannaya.
- In this unit students learn about the works of palkuriki, Nannechodudu and Mallikarjuna.
- This unit explains period of Srikrishna Devaraya and ashtadiggaja authors.
- This unit explains the poetry of Skhethraiah, Thyagaiah and werious authors.

#### **COURSE – II**

##### **TITLE OF THE PAPER: HISTORY OF TELUGU LITERATURE (MODERN TO CONTEMPARARY)**

- This unit explains about the qualities of modern poetry and also types of poetry.
- students learn about Rayaprolu, Devulapalli and different kinds of modern poetry.s
- This unit aims at the revaluation poets.
- This unit explains Muslim(minorities) poetry and Deltas poetry.
- In this unit students can learn new style of poetry.

### **COURSE – III**

#### **TITLE OF THE PAPER: ESSAY WRITING**

- Students learn the meaning, qualities of Telugu and English essay writings.
- This unit introduces the styles and qualities of language.
- This unit explains the beginning, ancient and modern creative essay writing.
- This unit explains Argumentative essays.
- In this unit student learn different types of essays.

#### **SEM – V**

### **COURSE – I**

#### **TITLE OF THE PAPER: THE STUDY OF IMPORTANT AUTHORS**

- In this unit students learn Viswanada Sathya Narayana works and his life history.
- This unit explains about Joshua and his literary works.
- This unit gives an account of Rachakonda viswanadha sastry.

### **COURSE – ii**

#### **TITLE OF THE PAPER: ANCIENT LITERATURE-IMPORTANT EVENTS**

- In this unit explains the poetry of Nannaya.
- This unit explains Sanjaya Rayabharam by Thikkana.
- In this unit students learn about the history of Prahallada by Pothana.
- This unit explains about Varoodhini Pravarulu by Allasani Peddana.
- This unit presents the event of Asokavanamlo Janaki by Molla.

### **COURSE – iiii**

#### **TITLE OF THE PAPER: GRAMMAR - 2**

- In this unit students learn basic Grammar.
- Students learn different types of figures of speech.
- In this unit students study different Grammar points.
- This unit student learns about rhymes.

#### **SEM – VI**

### **COURSE – I**

#### **TITLE OF THE PAPER: JOURNALISM**

- It helps the student to understand about the definition, qualities, and types of communication.
- Definition of reporting, editing, types, reporting, qualifications and ethics of reporting etc.
- The purpose of this unit is to provide a detailed description of news features.
- To explain clearly about the origin and the development of Telugu news papers.

### **COURSE – ii**

#### **TITLE OF THE PAPER: MODERN POETRY AND DRAMA**

- It gives the information of Bhava kavithvam, and introduces the works of Krishna sashtry and Rayaprolu Rubbarao.
- Students learn about progressive poetry of Sree Sree.
- In this unit Students learn about Anubhuthi Kavithvam of thilak and k. Geetha.
- This unit gives information regarding Potluri Narayana and Ravi Sashtry.

### **COURSE – iiii**

#### **TITLE OF THE PAPER: TELUGU NAVALA SAHITHYAM**

- this unit high lights the definition , qualities development and divisions of Telugu Navala Sahithyam
- Students know about padava prayanam of palagummi padmaraju.
- It gives detail information about the Novel “Paschathapam ledu” by Buchi Babu.

Students study about the novel “Sukantham” by Abburi Chayadevi.

## **PG CO**

### **Course outcomes**

I sem

General linguistics

CO -I Understand the language origins and basic features of language

CO -II Dissemination of characters, terminology

CO -III To understand the language structure in pre- Nannayya period

Trends of telugu literature

CO -I Basic concepts in history of literature

CO -II Bringing awareness in epic culture

CO -III Brief study in prabanda period

CO -IV Modern literary concepts

Basics of computers

CO -I Basic concepts in computers for current purposes

CO -II Brief study in hardware components and software components

CO -III To study computer languages

CO -IV Networking concepts

Soft skills and self skills

CO -I To fulfill corporate needs like presentation, networking, spoken skills

CO -II To aware language essentials

CO -III Heading skills to estimate body language

CO -IV Awareness on team works , explaining how to recognize success by team work

CO -V Creating idea on personality development

Semester

Course Paper

Course outcomes

II sem

Machine translation

CO -I Bring the idea in translation, carried out by a computer

CO -II Use of Machine translation and giving the idea in relevance of MT

CO -III Various methods in machine translation.

CO -IV Introducing different software's developed by various organizations and universities

CO -V Idea in machine translation efforts in India

Techniques of translation

CO -I How to utilize the concepts and techniques in translation to connect the world

CO -II Bringing the idea on source language and target language

CO -III Different types of translations

CO -IV History of Telugu translation from Nannaya(early days) to modern poets

CO -V Analyzing the contents of translation in Mahabaratha

Basics of computing languages

CO -I Learning languages that are required to do work with computer for translations.

CO -II Introduction for basic components in computers

CO -III Bringing knowledge in file system

CO -IV Learning the techniques in PERL language

CO -V To study how to write computer programs

Globalization

CO -I To full fill corporate needs like presentation, networking, spoken skills

CO -II To aware language essentials

CO -III Gaining an idea of how countries are coming together as one big global economy, making the trading easier

CO -IV What is globalization, concepts in globalization

CO -V Globalization and concepts of internet

CO -VI Economical affairs in India before globalization and after globalization

CO -VII Cyber culture, urban culture

Semester

Course Paper

Course outcomes

III sem

Epics and moral values

CO -I To aware the values in epics

CO -II Moral values in epics

CO -III Concepts in Indian family system

CO -IV Analyzing the unique character of 'Rama'

CO -V Concepts in vidura neethi

CO -VI Study how to acquire good behavior as a student through prahlada character

Natural language processing

CO -I Students will get an idea about how to do research

CO -II Aim to gather knowledge

CO -III How human being understand and use language for appropriate tools and techniques

Human resource management

CO -I Understanding the concept of introduction to HRM

CO -II Obtaining knowledge on Human Resource Planning

CO -III Acquire knowledge on developing Human resources

CO -IV To understand the concept of motivating human resources

CO -V Able to understand how to maintain human resources

Communication and Journalism

CO -I To understand the skills in writing for news papers, magazines and how to prepare news

CO -II Study on different types of communication

CO -III Reporting, methods in reporting

CO -IV Study on different types of news

CO -V To aware origin of news, history of telugu news papers, different kinds of telugu news papers

CO -I Famous journals and journalists

CO -II Comparative study of Journalism and translation

Semester

Course Paper

Course outcomes

IV sem

Project

CO -I Research is most effective tool for present education scenario. It plays an important role to discover new facts in required fields.

CO -II In this semester students take a topic about their desired field

CO -III Students meet the people for field reports.

CO -IV For the project work students take help of web resources, library

CO -V Taking help of lecturer for completion of thesis

CO -VI For doing project , students learn to compute their thesis by their own.

## ZOOLOGY

### COURSE OUTCOMES OF ZOOLOGY (COs )

#### I-YEAR SEMESTER- I

##### **Paper – 1 ANIMAL DIVERSITY-INVERTEBRATES Q.P.Code No : (1114)**

**On completion of the courses students will be able**

- CO1:** To Understand the evolution, history of Invertebrates, distinguishing Characters of Protozoa and Porifera and provide knowledge with respective examples like Elphidium and Sponges
- CO2:** To understand the Coelenterates and Helminths with life cycles of Aurelia and Fasciola, Economic importance of Corals and Polymorphism
- CO3:** To study the characters of Annelida, various Systems of Leech in specific and Significance and economic importance of Vermicompost.
- CO4:** To understand the systemic and functional morphology of Arthropoda in specific Macrobrachium rosenbergi and Mollusca. To acquire knowledge about Economic importance of pearl formation, Systematic position of Peripatus
- CO5:** To acquire knowledge about star fish water vascular System, Invertebrate Larval forms and systematic position of Hemichordata or Balanoglosses

#### **I-YEAR SEMESTER – II, PAPER – II : ANIMAL DIVERSITY OF VERTEBRATES (2214 –A)**

- CO1:** To learn about the origin and characters of Chordata, Prochordata with all Physiological aspects and significance of Retrogressive metamorphosis in Ascidians.
- CO2:** To gain knowledge about cyclostomata and pisces with all physical properties and anatomy including Depnoi fishes.
- CO3:** Fundamental concepts of amphibians, reptilia with illustrations.
- CO4:** To understand physiology of Aves, migration and flight adaptations in birds.
- CO5:** To gain knowledge about physiology of mammalia and dentition in mammals.

#### **II-YEAR SEMESTER- III**

##### **Paper III : CYTOLOGY, GENETICS & EVOLUTION (3314)**

**On completion of the courses students will be able:**

- CO1:** To understand the basic unit of the organism and differences between prokaryotic and Eukaryotic cells
- CO2:** To study and understand the whole cell organelles with their structure and function
- CO3:** To explain the arrangement of Genes and their interaction.

CO4: To understand extra nuclear inheritance, linkage & crossing over

CO5: To Understand the process of evolution with Evidences

## **II-YEAR SEMESTER- IV**

### **Paper IV : EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY (4414-A)**

#### **On completion of the courses students will be able:**

CO1: Explain the formation and development of egg, sperms, fertilization and growth of each organisms.

CO2: Able to describe the physiology of digestion, respiration excretion and Circulation.

CO3: To understand the nature of endocrine glands and their secretion and process of reproduction, Nerve impulse transmission ,Muscle contraction.

CO4: To understand the abiotic factors, nutrient Cycles within the ecosystem,

CO5: To understand the Community interactions, Population Studies, Ecological Succession and zoogeographical realms.

## **III-YEAR SEMESTER- V**

### **PAPER V : ANIMAL BIOTECHNOLOGY (55141)**

#### **On completion of the courses students will be able:**

CO1 : To gain knowledge about DNA technology and its applications - Restriction modification systems, DNA modifying enzymes and Cloning vectors

CO2 : Familiar with concepts and applications with suitable skills in biotechnology like Use of Linkers and Adopters, Gene delivery, PCR, DNA Sequencing, Hybridization techniques Genomic and cDNA Libraries

CO3 : To gain good knowledge about animal cell technology, hybridoma technology and stem cells with suitable illustrations.

CO4 : To understand the Reproductive Technologies like Artificial Insemination, *In vitro* fertilization , super ovulation, Embryo transfer, Embryo cloning and Transgenic animals and their applications.

CO5: To Under stand the basic concepts of Applied Biotechnology in Industry, in Agriculture and DNA fingerprinting

### **III-YEAR SEMESTER- V**

#### **PAPER : VI ANIMAL HUSBANDRY (55142)**

##### **On completion of the courses students will be able:**

- CO1:** To gain knowledge about poultry farming, Systems of poultry farming and Management
- CO2:** To learn about poultry feed management, Methods of feeding and poultry Diseases control and management useful to the students for poultry farming.
- CO3:** To know about selection, care and handling of hatching eggs, Egg testing, Methods of hatching. Brooding and rearing, Sexing of chicks.
- CO4:** Complete knowledge of breeds of dairy cattle and buffaloes, Housing of dairy Animals, Cleaning and sanitation of dairy farm, Deworming and Vaccination, Programme, Records to be maintained in a dairy farm to improve practical skill such as dairy farm.
- CO5:** To know the principles of care and management of dairy animals.

### **III-YEAR SEMESTER- VI**

#### **ELECTIVE PAPER : VII IMMUNOLOGY (614EL01)**

##### **On completion of the courses students will be able:**

- CO1:** To Overview the basic concepts of Immune System, Types of Immunity, Cells and Organs of Immune system.
- CO2:** To Under stand the Basic properties of antigens, B and T cell epitopes, haptens and adjuvants Factors influencing immunogenicity
- CO3:** To know about the Structure,Classes and functions of antibodies and Monoclonal antibodies
- CO4:** To Under stand the Working of Immune system, major histocompatibility Complexes, cytokines
- CO5:** To gain knowledge about Immune system in health and disease, types of hypersensitivity and Vaccines

### **III-YEAR SEMESTER- VI**

#### **CLUSTER PAPER VIII, CLB1- PRINCIPLES OF AQUACULTURE**

(614CLB1)

##### **On completion of the courses students will be able:**

- CO1-** To Understand the History, Present status and major Cultivable Species of Aquaculture and its selection for culture.
- CO2-** To Get knowledge on different types of aquaculture, culture systems And culture practices

CO3- To gain Knowledge on Design and construction of aquafarms, seed Resources, Nutrition and feeds of carp and prawns

CO4- To Understand the Management of carp culture ponds and Culture of Giant freshwater prawn

CO5- To Understand the Culture of shrimp, pearl oysters, seaweeds, Ornamental fishes

**III-YEAR SEMESTER- VI**

**CLUSTER PAPER VIII, CLB2 - AQUACULTURE MANAGEMENT**

(614CLB2)

**On completion of the courses students will be able:**

CO1- To Know about the Breeding and Hatchery Management of Carp and Prawn

CO2- To understand the water quality management for fish and shrimp culture

CO3- To gain Knowledge on Feed Management in fish and shrimp ponds

CO4-- To Get knowledge on Disease Management fish and shrimp ponds

CO5- To Know about the Economics and Marketing of Fish and Fisheries Extension

**III-YEAR SEMESTER- VI**

**CLUSTER PAPER VIII, CLB3 – POST HARVEST TECHNOLOGY**

(614CLB3)

**CO1:** To know about the Handling, storage and transport of fresh fish, rigor mortis and spoilage, Principles of preservation

**CO2:** To Understand the Traditional and Advanced Methods of fish Preservation

**CO3:** To learn about Processing and preservation of fish and fish by-products, Seaweeds and its applications in Foods and Therapeutic Drugs.

**CO4:** To know about the Sanitation in processing plants, Quality Control of fish and fishery products.

**CO5:** To get knowledge in Seafood Quality Assurance and Systems, Management and Certification of National and International standards

## **COURSE OUTCOMES**

### **HUMAN NUTRITION&NUTRACEUTICAL CHEMISTRY**

#### **SEMESTER-I**

##### **BASICS OF HUMAN PHYSIOLOGY**

To acquire knowledge on basics of cell biology , the importance of physiological systems like digestive system ,respiratory system, cardiovascular system, endocrine system , reproductive system ,nerves system and also about renal system .

##### **NUTRITIONAL BIOCHEMISTRY**

To studying about biomolecules ,(Carbohydrates ,proteins ,lipids ) ,metabolic cycles and also to understand about enzymes .

##### **NUTRACEUTICALS AND FUNCTIONAL FOODS**

To gain knowledge of functional foods and nutraceuticals , to know the role of functional foods like antioxidants ,bioactive phyto chemical ,pre and probiotics . and also to study about role of nutraceuticals in disease management and future of medical science

##### **FOOD MICROBIOLOGY**

To attain knowledge on the importance of microorganisms in food ,the methods which used for the isolation and detection of micro organisms and their products in food ,to know about food spoilage ,food born diseases and also to study of food preservation

#### **SEMESTER-II**

##### **PAPER-I-Essentials of Macro Micro Nutrients -21001**

CO-I : To aware food groups like cereal grains ,Millets ,milk and milk products ,meat ,species and condiments .

CO-II : To study of Macro nutrients ,Micro nutrients and also about major nutrient problems because of nutritional deficiency .

##### **PAPER-II-HUMAN NUTRITION -21002**

CO-I: To create knowledge on the importance of nutrients during pregnancy during lactation , during infancy ,child hood and adolescents .

CO-II: By following RDA standards studying about growth & development by special nutritional care during geriatric and also in special needs.

### **PAPER-III-CLINICAL THERAPEUTIC NUTRITION-21003**

CO-I; To study the importance of therapeutic nutrition specially and health disorders, gastrointestinal problems, renal disorders, liver disorders, under metabolic disorders and also know about diet, nutrient drug interaction.

### **Paper-IV –BIostatistics RESEARCH METHODOLOGY -21004**

CO-I; -To gain knowledge on biostatistics and its applications, different research methodologies including inferential properties, probability.

### **SEMESTER-III**

#### **PAPER-I-31001-COMMUNITY NUTRITION -**

Co-I: To study about the nutrition status and nutritional anthropometry, biochemical methods, dietary survey, age specific mortality and morbidity rates.

Co-II; To study about Nutritional status assessment, about nutritional intervention programmes, national and international organizations.

Co-III- To know about the nutrition education training guidelines, principles of planning, evaluating nutrition education programs.

Co-iv; To attain knowledge importance of food security determines, strategies to overcome food insecurity.

#### **PAPER-II-31002-FOOD PROCESSING SAFETY -**

CO-I; To learn principles and methods of processing; cereals, pulses and grains, milk and milk products. pasteurization, sterilization, homogenation, drying.

Co-II; To learn about the meat and flesh foods; smoking, drying, canning. Fruits and vegetables fumigation.

Co-III- : To attain knowledge importance of commonly adulterated health hazards of adulterants.

Co-iv :- To study about the national food laws acts and implementing agencies ,food standard quality control.

### **PAPER-III-31003**

#### **DEVELOPMENT &MARKETING OF NUTRACEUTICALS AND FUNCTIONAL FOODS**

CO-I:- To attain knowledge innovation product development and social concerns and health concerns impact of technology and market place influence .

Co-II:- To study about the new technologies development of nutraceuticals functional foods from various sources application of bioprocess technology.

Co-III:- To know about the packaging strategies for nutraceutical products ,plastic packaging ,glass packaging , paper bases packaging foods .

Co-IV :- To study about the labeling claims for nutraceutical products ,dietary supplements , nutritional content claims , health claims FDA requirements .

### **PAPER-IV -31004-INSTRUMENTAL TECHNIQUES**

CO-I:-To know about ultra violet and visible spectroscopy, various electronic transitions (185-800nm).

CO-II:- To attain knowledge instrumentation and sample handling . characteristic vibration of alkenes ,alkenes ,alkenes,aromatic compounds ,alcohols ,ethers ,phenols and amines .

Co-III:- To study about the Chromatography ,general principles involved in separations by paper ,thin layer ,column and ion exchange chromatography .Electron porosis and PCR.

### **SEMESTER-IV**

#### **Paper-I -41001- Nutritional assessment**

Co-I :- To study the assessment of nutritional status .Direct methods –anthropometric ,biochemical , clinical dietary assessments .

Co-II:- To know the methods of estimation of protein quality and protein efficiency ratio (PER ), digestibilityco efficient ,biological value (BV), net protein utilization (NPU).

Co-III:- To study the growth studies and animal models . Growth and development of rats –role of different protein levels of the diet protein sources of the diet .

Co-iv :- To attain knowledge of growth and metabolic studies with human subjects , infants on feeding different portion sources .

## **Paper-II -41002 – GERIATRIC NUTRITION**

CO-I:- To study the process ageing –physiological and biochemical and body compositional changes – theories of aging .

Co-II:- To know about the Food and nutrition needs of the elderly – dietary management-special problems of women –menopausal ,post-menopausal problems .

Co-III:- To study the chronic degenerative disease and nutrition and health problems of the elderly their etiology, prevention and control .

Co-iv :- To attain knowledge policies and programmes of the government of NGO sectors .

## **PAPER-III – 41003- NUTRITION IN EMERGENCES AND DISASTERS**

CO-I ; - To study the natural ,manmade disasters resulting in emergency situations .Famine ,drought ,flood , earthquake ,cyclone, war ,civil and political emergencies.

Co-II:\_ To know about assessment and surveillance of nutritional status in emergency affected populations .

Co-III:- To attain knowledge of assessment of food needs in emergency situations , mass and supplementary feeding , therapeutic feeding , special foods for nutrition relief .

CO-IV :- To study the Introduction of epidemiology , secondary routine data ,cross sectional analysis .

# M.Sc. Physics

## COURSE OUT COMES

### SEM-I

**COURSE CODE: PHY 10201-A**

**COURSE TITLE: PHY-CLASSICAL MECHANICS AND THEORY OF RELATIVITY**

**CO1:** Understand and derive the Lagrangian & Hamiltonian mechanics and its applications.

**CO2:** Analyze the canonical transformations and understanding the Hamilton- Jacobi theory.

**CO3:** Apply the knowledge of basics conditions for closed orbits and rigid body dynamics

**CO4:** Understand and analyze the postulates of special theory of relativity and its applications.

**COURSE CODE: PHY 10202-A**

**COURSE TITLE: PHY-ATOMIC AND MOLECULAR PHYSICS**

**CO1:** Knowledge for the hydrogen atom, three quantum numbers, alkali elements, selection rule and coupling schemes of atomic spectra.

**CO2:** To explain the Zeeman, stark and paschen-back effects.

**CO3:** Knowledge for the different types of diatomic molecules and its applications of rotational energies.

**CO4:** Knowledge for the different types of diatomic molecules and its applications of vibrational spectra.

**COURSE CODE: PHY 10203-A**

**COURSE TITLE: PHY-SOLID STATE PHYSICS**

**CO1:** Explain the origin of chemical bonding in ionic and Vander Waals crystals, elastic properties and quantization of lattice energies and vibrations.

**CO2:** Explain the matheissens rule and relaxation time approximation of transport phenomena and band theory.

**CO3:** Explain the types of semiconductors, Hall Effect and determination of life time diffusion length of minority charge carriers.

**CO4:** To Understanding the concept of zero resistance, differs between the perfect conductors and super conductors and its applications.

**COURSE CODE: PHY 10204-A**

**COURSE TITLE: PHY-ANALOG AND DIGITAL ELECTRONICS**

**CO1:** Apply the knowledge of basics of FET and MOSFET in understanding their characteristics.

**CO2:** Uses the basics of operational amplifier to understand its practical applications in electronic circuits.

**CO3:** Implement simple logic operations using combinational logic circuits and understand the working of sequential logic circuits like as RS ff, JK ff and D ff etc.

**CO4:** Understand and analyze the internal operation of 8086 microprocessor.

## **COURSE OUTCOMES**

### **SEM-II**

**COURSE CODE: PHY 20201-A**

**COURSE TITLE: PHY-STATISTICAL MECHANICS**

**CO1:** To understand the Types of ensembles and comparison of various ensembles.

**CO2:** Analyze the canonical partition function, Vibrational partition function and their Applications.

**CO3:** To gain the knowledge of Maxwell-Boltzmann distribution and Two fluid model.

**CO4:** Explain the Fermi-Dirac distribution and one dimensional random walk.

**COURSE CODE: PHY 20202-A**

**COURSE TITLE: PHY-ELECTROMAGNETIC THEORY, LASERS AND MODERN OPTICS**

**CO1:** To Analyze the Maxwell's equations and Retarded potentials.

**CO2:** Understand the different types of lasers, Basic principles and their Applications.

**CO3:** To explain the Basic theory of Holography and Two dimensional Fourier transforms.

**CO4:** To learn the Total internal reflection and Applications of optical fibers in communication and medicine.

**COURSE CODE: PHY 20203-A**

**COURSE TITLE: PHY- MATHEMATICAL PHYSICS**

**CO1:** To explain the Beta and Gamma functions and Legendre, Bessel and Hermit differential equations and their Recurrence relations.

**CO2:** To gain the knowledge of Fourier Transforms and Laplace Transforms.

**CO3:** To understand the Laplace equations and thermal expansion.

**CO4:** To learn the Cauchy-Riemann equations and Residue theorem.

**COURSE CODE: PHY 20204-A**

**COURSE TITLE: PHY-COMPUTATIONAL METHODS AND C- PROGRAMING**

**CO1:** To explain the creating & editing Document, Worksheet and Presentation.

**CO2:** To understand the data types Controlling statements and Arrays.

**CO3:** learn the Bisection, Gauss elimination method and their Algorithms.

**CO4:** To gain the linear interpolation, Numerical differentiation and fourth order Runga-kutta Method.

## **COURSE OUTCOMES**

### **SEM-III**

**COURSE CODE: PHY 30201**

**COURSE TITLE: PHY-QUANTUM MECHANICS -I**

**CO1:** Learn the postulates of Quantum mechanics and derive the Eigen values and Eigen function of barrier & well and explain the operators, bra –Ket notation and its properties.

**CO2:** Explain the angular momentum and their Eigen values, Eigen functions & C-G coefficients.

**CO3:** Understand and analyzed the time dependent & time independent perturbation theory for generate and degenerate levels.

**CO4:** Analyze the scattering theory, partial wave analysis, born approximation and its validity condition.

**COURSE CODE: PHY 30202**

**COURSE TITLE: PHY-NUCLEAR AND PARTICLE PHYSICS**

**CO1:** To understand & analyze the nuclear forces and models.

**CO2:** To explain the types of nuclear reactions, nuclear decays and its selection rules.

**CO3:** Understand the types of nuclear accelerators and reactors.

**CO4:** Apply the knowledge of basis of elementary particles, types and their properties.

**COURSE CODE: PHY 30203**

**COURSE TITLE: PHY- PHYSICS OF SEMICONDUCTOR DEVICES**

**CO1:** To understand the I-V characteristics of junctions like as P-N & Interfaces like as metal-semiconductor.

**CO2:** To explain the junction diodes like as majority carrier diodes, microwave devices & optoelectronic devices.

**CO3:** Apply the knowledge of basis of BJT, FET, and MOSFET & CCD.

**CO4:** To explain the power rectifiers, thyristors and technology of semiconductor devices.

**COURSE CODE: PHY 30204**

**COURSE TITLE: PHY-CONDENSED MATTER PHYSICS-I**

**CO1:** To understand the imperfection in crystals and classifications.

**CO2:** To explain the classification, properties and applications of Ferro electrics and Ferromagnetism.

**CO3:** Understand the crystal growth and characterization.

**CO4:** To explain the fluorescence and phosphorescence and its applications.

# **COURSE OUT COMES**

## **SEM-IV**

**COURSE CODE: PHY 40201**

**COURSE TITLE: PHY- QUANTUM MECHANICS -II**

**CO1:** To understand the different types of pictures and Poisson and commutation brackets their properties.

**CO2:** To explain the identical particles and molecules.

**CO3:** To explain the Klein –Gorden equation, probability, inadequacies of K.G equation.

**CO4:** Understand and analyze the method of canonical quantization, second quantization and N-representation system.

**COURSE CODE: PHY 40202**

**COURSE TITLE: PHY-ANALYTICAL TECHNIQUES**

**CO1:** To gain the knowledge of diffraction methods for structure analysis.

**CO2:** To explain the electron spin resonance spectroscopy and analyze the Mossbauer spectrum.

**CO3:** To understand the theory of NMR and basic concepts of NQR spectra.

**CO4:** To gain the knowledge of instrumentation and applications of photoelectron spectroscopy and scanning electron microscopy.

**COURSE CODE: PHY 40203**

**COURSE TITLE: PHY-ADVANCES IN PHYSICS**

**CO1:** Understand the emergence of nanotechnology and analyze the physical vapour deposition.

**CO2:** Analyze the basic structure and applications of MEMS and nanodevices.

**CO3:** To gain the knowledge of 8051 micro controllers and single-bit instructions.

**CO4:** To analyze the electromagnetic spectrum and applications of remote sensing.

**COURSE CODE: PHY 40204**

**COURSE TITLE: PHY- CONDENSED MATTER PHYSICS-II**

**CO1:** Analysis of stress and strain tensors and Elastic waves in cubic crystals.

**CO2:** To explain the properties of phonons and experimental study of dispersion curves.

**CO3:** To Understand the energy band calculations and construction and characteristics of Fermi surface.

**CO4:** To Understand the classification of amorphous semiconductors and liquid crystals and polymers their applications.

# M.Sc. Chemistry

## COURSE OUTCOMES

### SEMESTER -I

- **COURSE CODE: CHE -10301**
- **COURSE TITLE: CHE -101- IN ORGANIC CHEMISTRY**

**CO1:** Explain the basics of crystal field theory, CFSE and its calculations splitting of d-orbital, structures (trigonal, square planar, pyramidal, pentagonal), its applications and MOT of coordinate bond, M.O diagram

**CO2:** Explain the general characteristics of the Non-Transition elements, special features of individual elements Synthesis, properties & structure of some Non-Transition elements

**CO3:** learn to Reactivity of metal complexes, inert & labile complexes, kinetics & mechanism of substitution reactions, acid & base hydrolysis reaction

**CO4:** Understand the preparation, properties, structures, VBT, MOT, EAN of the metal carbonyls and metal nitrosyls

- **COURSE CODE: CHE -10302**
- **COURSE TITLE: CHE- 102 - ORGANIC CHEMISTRY**

**CO1:** Explain the aromatic, non aromatic, benzenoid and non benzenoid compounds that follow the Hückel rule, structure and synthesis of some aromatic compounds

**CO2:** learn to the aliphatic and aromatic substitution reactions classification of substitution reactions NGP, Bandings, reactivity of substrate and examples

**CO3:** Explain the representation of organic molecules and Optical isomerism: Molecular Symmetry and Chirality, classification-configuration of cis and trans, R-S isomers some examples

**CO4:** learn to the Type of reactions and mechanisms and some examples, thermodynamic and kinetic requirements and controls, potential energy diagrams (allyl and arynes, free radicals)

➤ **COURSE CODE: CHE- 10303**

• **COURSE TITLE: CHE -103 -PHYSICAL CHEMISTRY**

**CO1:** Explain the Quantum mechanical results of operator algebra, momentum and energy. the Schrödinger's equation, particle in a box and some modals, And approximate methods (first order, non degenerate)

**CO2:** learn to the chemical dynamics of rate laws, collision theory, Lindeman-Hinshelwood (RRKM) theory and applied photochemical reactions (H, Br, HCl), Autocatalysis-H, O reactions

**CO3:** Analyze the thermodynamic derivation of phase rule, solid-liquid, thermal analysis and applications, Two component system

**CO4:** Analyzed The Electro Chemistry Debye Huckel-Onsager equation, limitations examples activity and activity coefficients EMF method their limitations and reversible electro chemical cells (liquid junction potential), electro catalysis

➤ **COURSE CODE: CHE -10304**

• **COURSE TITLE: CHE -104 - SPECTROPHOTOMETER GROUP THEORY AND ANALYTICAL METHODS**

**CO1:** Explain the basic principles of spectroscopy and electromagnetic spectrum, width of spectral lines. And UV & visible spectroscopy (Beers-Lambert's law) some examples are Cr & Mg in mixtures.

**CO2:** To analyze symmetry and group theory, sub groups and classification point symmetry group, symbols (C<sub>n</sub>, C<sub>nv</sub>, D<sub>nh</sub>) etc.

**CO3:** To analyze analytical methods and types of errors, significant figures their examples and calibration of weights, glass wear.

**CO4:** Explain the basic principles of thermal methods and radio analytical methods their examples.

## COURSE OUTCOMES

### SEM-II

➤ **COURSE CODE: CHE 20301**

• **COURSE TITLE: CHE 201 IN ORGANIC CHEMISTRY**

**CO1:** Explain transition metal  $\pi$ -complexes understand organic molecules their preparation, properties, structures and reactivity.

**CO2:** To learn electronic spectra of complexes Frank-condon principle - Russell-Saunders coupling - spectroscopic term symbols - selection rules - break down of selection rules - Orgel Diagrams for  $d^1$  to  $d^9$  configurations.

**CO3:** To explain magnetic properties of transition metal complexes and calculation of magnetic moment from magnetic susceptibility of examples Ti (III), V (III),  $VO^{2+}$ , Cr (III), Mn (II), Fe (III), Co(II), Ni (II) and Cu (II).

**CO4:** To analyze catalysis reactions, classification, redox reactions other types of catalyzed reactions in their examples.

➤ **COURSE CODE: CHE 20302**

• **COURSE TITLE: CHE 202 ORGANIC CHEMISTRY**

**CO1:** Explain the elimination reactions and etherification and their types, factors, molecular rearrangement some reactions.

**CO2:** Explain the stereochemistry of geometric isomerism, classification and conformational analysis and their reactivity of cyclic & acyclic molecules examples of some isomerism.

**CO3:** Explain the nomenclature of heterocyclic compounds (Hantzsch-Widman) three & four member cycles their synthesis and chemical properties.

**CO4:** Explain the definition, general methods of isolation, isoprenoid rule, classification and synthesis of terpenoids.

➤ **COURSE CODE: CHE 20303**

• **COURSE TITLE: CHE 203 PHYSICAL CHEMISTRY**

**CO1:** Explain the Quantum Chemistry Angular momentum- Generalised Angular momentum, Electronic structure of Atoms and molecular orbital theory of heckle rile their applications and examples.

**CO2:**To learn surface chemistry ,vapour process ,Gibbs adsorption isotherm BET equation and micelles their classification CMC reactions.

**CO3:** Explain the Classical Thermodynamics, Statistical Thermodynamics, Derivation of Gibbs- Durham's equation, calculation of thermodynamic properties in terms of portion functions – Heat capacity, chemical equilibrium and equilibrium constant in terms of partition functions .

**CO4:**Explain the Reversibility and irreversibility , Dissolution and deposition, voltage, charge transfer,polarography reactions in electro chemistry.

➤ **COURSE CODE: CHE 20304**

• **COURSE TITLE: CHE 204 –BIO INORGANIC, BIO ORGANIC BIO PHYSICAL & CHEMOTHERAPY**

**CO1:** Explain the bio inorganic chemistry ,hydrolytic metalo enzymes ,importance of metal in biology and metal complexes.

**CO2:**To learn carbohydrates lipids and fatty acids their structures and biological importance of bio organic chemistry.

**CO3:**To learn bio physical chemistry, polymers, enzymes(DNA & RNA) Structures and functions.

**CO4:**To Explain chemotherapy,anti materials and anti biotics ,their structures and synthesis structure activity relationship.

## COURSE OUTCOMES

### SEM-III

➤ **COURSE CODE: CHE 30301**

• **COURSE TITLE: CHE 301 - ORGANIC CHEMISTRY-I**

**CO1:** To Learn Addition Reaction C-C, C=C, C=O, C=N reactions and some named reactions, rearrangements, examples

**CO2:** learn to the reagents in uses in organic synthesis reactions examples (AlCl<sub>3</sub>, BF<sub>3</sub>, N-Bs, DDQ-etc)

**CO3:** Explain the some organo metallic reagents their uses in organic reactions (Zn, Co, Me, Rh, Pd, Ni)

**CO4:** Explain the Topicity, Prochirality, Pro stereoisomerism-Substrate Selectivity, Diastereo selectivity, classify cation of Asymmetric Synthesis ,some examples

➤ **COURSE CODE: CHE 30302**

• **COURSE TITLE: CHE 302 - ORGANIC CHEMISTRY-II**

**CO1:** To Learn Replacement and Hantzsch-Widman nomenclature of five membered, six membered and fused heterocycles and their synthesis

**CO2:** learn to the Benzofused Five and Six Membered Heterocyclic Compounds, their synthesis and functions

**CO3:** Explain The Polymer Reactions, Stereo specific Polymers, Preparation of Polymers based on different types of polymers and synthesis

**CO4:** Analyzed the oxidation and reduction reaction ,difference between the oxidation and reduction ,some examples

**COURSE CODE: CHE 30303**

**COURSE TITLE: CHE 303 –ORGANIC SPECTROSCOPY AND ITS APPLICATIONS**

**CO1:**To define the UV spectroscopy ,ORD and Circular dichroism principle , some examples

**CO2:** To analyze the IR spectroscopy ,FT-IR spectroscopy, values and applied some carbonyl compounds

**CO3:**To explain the NMR spectroscopy, <sup>13</sup>C NMR spectroscopy and their applications classification of Couplings(ABX,AMX,ABC,A2B2 etc),COSY,NOESY,DEPT,HSQC,HMBC.

**CO4:** To analyze the Mass spectroscopy values, types. Molecular ion peak, EI, CI, FD and FAB , examples of mass spectral fragmentation of organic compounds with respect to their structure determination.

➤ **COURSE CODE: CHE 30304**

• **COURSE TITLE: CHE 304 – GENERAL CHEMISTRY**

**CO1:** To analyze the structure, bio synthesis, biological importance, classification of Vitamins And Prostaglandins

**CO2:** To analyze the structure, bio synthesis, biological importance, classification of enzymes as a tool for drug development(aspirin).

**CO3:** Knowledge for drug discovery and principle of drug design, classification of drug some examples their biological importance.

**CO4:** Knowledge for different types of chromatography techniques used for modern separation methods.

## COURSE OUTCOMES

### SEM-IV

➤ **COURSE CODE: CHE 40301**

• **COURSE TITLE: CHE 401 - ORGANIC SYNTHESIS-I**

**CO1:** Learn to the organometallic reagent used for organic reactions(B,S,Si,Pa).

**CO2:** Knowldged for some rearrangements used in organic reactions, classification of rearrangements (C,N,O) and aromatic rearrangements.

**CO3:** Knowldged for different types of reactions involved in organic synthesis, used for PTC,microwave, enamine, ionic liquid .

**CO4:** Learn to the molecular orbital symmetry used for organic molecules,electrocyclic reactions, classification , $4n+2$  rule .

➤ **COURSE CODE: CHE 40302**

• **COURSE TITLE: CHE 402 - ORGANIC SYNTHESIS-II**

**CO1:** :Knowledge for different types of organic reactions Disconnection Approach, Classification of organic reactions-C,C=C,C-X, Two C=X some examples.

**CO2:** Knowledge for different types of organic reactions, protecting group, one group two group and some examples.

**CO3:** Learn to the differences types of photo chemical reaction used in examples and cycle, acyclic compounds.

**CO4:** Learn to the molecular orbital symmetry used for organic molecules cyclo addition reactions some examples and sigma tropic rearrangements.

**COURSE CODE: CHE 40303**

**COURSE TITLE: CHE 403 –CHEMISTRY OF NATURAL PRODUCTS**

**CO1:** Knowledge for basic skeleton, nomenclature and bio synthesis of steroids and hormones.

**CO2:** Analyzed for accuracy, isolation, structure elucidation and physiological action, classification and biosynthesis of alkaloids.

**CO3:** Knowledge for synthesis, properties, structure and metabolism of proteins and peptides.

**CO4:** Learn to accuracy, isolation, structure elucidation and synthesis biological importance of flavanoids & isoflavanoids .

➤ **COURSE CODE: CHE 40304**

• **COURSE TITLE: CHE 404 – GREEN CHEMISTRY**

**CO1:** Knowledge for principle, atom economy and scope of green chemistry used in organic reactions.

**CO2:** Knowledge for synthesis of some examples used in multistep synthesis.

**CO3:** Understand the classification, characterization and applications of nonmaterial's.

**CO4:** Explain the structure synthesis and conformation of nucleic acid nucleotide.

## M.Sc. MATHEMATICS

### Course Outcomes

#### **SEMESTER- I: PAPER I - ALGEBRA**

**PAPER CODE: 10101**

CO1: To understand the basic concepts of G-sets and finite Abelian groups

CO2: To understand the basic concepts of ideals and homomorphism.

CO3: To gain the knowledge of Integrals domain and its applications

CO4: To study the basic concepts of Modules and its applications.

#### **SEMESTER- I: PAPER II - REAL ANALYSIS**

**PAPER CODE: 10102**

CO1: To understand the basic concepts of the Topological space.

CO2: Students identify the difference between the Riemann integral and Riemann Stieltjes integral.

CO3: To analyze the arithmetic sequences and series to solve the problems.

CO4: knowledgeable students will able to solve the proper and improper integrals

#### **SEMESTER- I: PAPER III – ORDINARY DIFFERENTIAL EQUATIONS**

**PAPER CODE: 10103**

CO1: To gain the problem solving Knowledge of Oscillating theory and boundary value problems.

CO2: To study order equations of power series and ordinary points.

CO3: To know some special functions of Mathematical physics

CO4: To understand the existence, uniqueness solutions of Picard's theorem.

**SEMESTER- I: PAPER IV - NUMERICAL METHODS AND C - PROGRAMMING**

**PAPER CODE: 10104**

CO1: To study the concepts of interpolation with cubic spline.

CO2: To know various techniques of numerical solutions of ordinary differential equations.

CO3: To study the basic concepts, definitions and over view of C

CO4: To understand the strings, functions, structure and pointers of C-Programming.

**SEMESTER- I: PAPER V – COMPLEX ANALYSIS**

**PAPER CODE: 10105**

CO1: To understand the basic introduction to the complex numbers and also Analytic functions

CO2: To understand the Mobius transformation and also how to solve different types of Mobius transformation problems.

CO3: To study the Cauchy integral theorem and their problems in Complex integral

CO4: To understand the solution for different types of power series problems

**SEMESTER-II: PAPER VI - DISCRETE MATHEMATICS**

**PAPER CODE: 20101**

CO1: To understand how to solve the problems by using the mathematical logics for the statements

CO2: To study the various methods of predicate calculus.

CO3: To understand both lattices and Boolean algebra.

CO4: The students will be able to apply principles and concepts of graph theory in practical situations.

**SEMESTER-II: PAPER- VII - MEASURE AND INTEGRATION**

**PAPER CODE: 20102**

CO1: Students can understand the basic concepts of sets and relations.

CO2: The students understand the difference between the measure and outer measure in the measure theory

CO3: Students can identify the Lévesque integral is extended to the Riemann Integral

CO4: To learn the differentiation and integration.

### **SEMESTER-II: PAPER- VIII – PARTIAL DIFFERENTIAL EQUATIONS**

**PAPER CODE: 20103**

CO1: To understand the orthogonal trajectories and the pfaffian differential equations.

CO2: Students can learn first order partial differential equations

CO3: To understand the canonical forms of the second order partial differential equations

CO4: To understand the Laplace equations and also understand the boundary value problems.

### **SEMESTER- II: PAPER IX - TOPOLOGY**

**PAPER CODE: 20104**

CO1: To know the basic concepts of set theory and its logics.

CO2: To gain knowledge of Topology, Basis and types of Topologies

CO3: To understand the concepts of connectedness, compactness.

CO4: To get the basic knowledge of countability and separation of axioms.

### **SEMESTER-I I: PAPER X – ADVANCED COMPLEX ANALYSIS**

**PAPER CODE: 20105**

CO1: To gain knowledge of Laurent series and to solve the singular point problems.

CO2: To study residue theorems and its applications.

CO3: To know the concepts of Harmonic functions and conformal mapping.

CO4: To understand the infinite product and partial fractions expansions.

### **SEMESTER- III: PAPER XI – COMMUTATIVE ALGEBRA PAPER CODE: 30101**

CO1: To know the basic concepts of ideals, modules and homomorphism.

CO2: To understand the concept of finite condition series.

CO3: To study the basic definitions of Noetherian rings and Hilbert basis theorem

CO4: To understand the Lasker – Noetherian decomposition theorem and applications of zero divisors, Nil potent elements.

**SEMESTER -III: PAPER XII – FUNCTIONAL ANALYSIS      PAPER CODE: 30102**

CO1: To understand basic concepts of Vector space and Normed linear space.

CO2: To get Knowledge of Natural imbedding theorems and open mapping theorem.

CO3: To understand the basic concepts of Hilbert spaces.

CO4: To study self adjoint operators and finite dimensional spectral theory.

**SEMESTER -III: PAPER XIII - DIFFERENTIAL GEOMETRY    PAPER CODE: 30103**

CO1: To Explain about the basic concepts of space curves and different types of planes

CO2: Students can understand the parametric equation of a surface and local intrinsic properties of a surface.

CO3: Students can identify the solution of local intrinsic and non intrinsic properties of a surface

CO4: To Explain about the Geodesic equations and canonical geodesic equations.

**SEMESTER-III: PAPER- XIV: NUMBER THEORY                      PAPER CODE: 30104**

CO1: To Study the properties of positive numbers and different types of Arithmetical functions

CO2: To Explain the Average of Arithmetical functions.

CO3: To understand the foundations of theory of congruence's.

CO4: To Explain the Quadratic residues and Quadratic non – residues and different functions of Quadratic reciprocity laws.

**SEMESTER-III: PAPER- XIV: CLASSICAL MECHANICS**

**PAPER CODE: 30105**

CO1: To analyze the concept of Mathematical physics, D'Alembert's principle and Lagrange's equations

CO2: To understand the variation principle and Lagrange's equations, non - halonomic system

CO3: To gain knowledge of Hamilton equations of motion by using the Lagrange's equations

CO4: To know the solutions for canonical transformations problems, Poisson's brackets and Jacobi theory.

**SEMESTER-IV: PAPER XV - GALOIS THEORY**

**PAPER CODE: 40101**

CO1: Students can understand the basic concepts of polynomials and ring polynomials and their properties and the extension field.

CO2: To study the difference between normal and separable extensions.

CO3: To learn Galois Theory

CO4: Students can identify the applications of Galois Theory to the classical problems.

**SEMESTER-IV: PAPER XVII - OPERATIONS RESEARCH**

**PAPER CODE: 40102**

CO1: To Understand different types of problems in Linear programming..

CO2: Students will know how to run many companies to get more property by using "Scientific inventory management".

CO3: To solve problems by using the dynamic programming.

CO4: To learn basics and characteristics of Game theory.

**SEMESTER- IV: PAPER XVIII – GRAPH THEORY**

**PAPER CODE: 40103**

CO1: To know basic definitions and concept of Graphs and sub graphs.

CO2: To gain knowledge of trees and its applications

CO3: To understand connectivity graphs and its applications.

CO4: To understand the Euler tour Hamiltonian cycles and its applications

**SEMESTER-IV: PAPER XIX- BANACH ALGEBRA PAPER CODE: 40104**

CO1: To identify the liner space and Ideals and understand the spectral radius formula

CO2: To study the Gelfand mapping and Gelfand neumark theorems,

CO3: To understand the compact Hausdorff space and its knowledge to apply on theorems

CO4: To study the basic concepts of Boolean algebra, Boolean rings and Picard's theorem.

**SEMESTER- IV: PAPER XX – MATHEMATICAL STATISTICS**

**PAPER CODE: 40105**

CO1: To know the basic concept and definitions of the probability set function.

CO2: To gain knowledge of distribution of functions and sampling theory

CO3: To study various distributions.

CO4: To gain knowledge of point estimations, confidence intervals and relevant theorems.

**COURSE OUTCOMES**  
**MBA**

**SEMESTER-I**

**SUBJECT & CODE: 10911A -MANAGEMENT ORGANIZATION THEORY**

- CO1:** To know the concept of Management and Objectives of business
- CO2:** To acquire knowledge of people behavior in Organization
- CO3:** To understand importance of Motivation, Communication and leadership qualities
- CO4:** To get awareness on Organization culture and framing of Organization structure for communication
- CO5:** To acquire International Management skills

**SUBJECT & CODE: 10912A- MANAGERIAL COMMUNICATION**

- CO1:** To focus on the importance of Communication in Organization
- CO2:** To get knowledge on principles for effective communication and communication technology
- CO3:** To understand Oral and Nonverbal communication
- CO4:** To know the role of written communication in Organization
- CO5:** To know the concept of Leadership communication and johari window concept

**SUBJECT& CODE: 10913A- MANAGERIAL ECONOMICS**

- CO1:** To acquire knowledge on Managerial Economics and the concepts of plant, firm and industry
- CO2:** To understand Demand & Supply, determinants of Demand, Demand forecasting
- CO3:** To Prime focus on Cost, Volume, Profit analysis and BEP analysis
- CO4:** To understand the concept of pricing and different types of markets
- CO5:** To get awareness on National income, Macro economic factors

**SUBJECT & CODE: 10914A -ACCOUNTING FOR MANAGERS**

- CO1:** Acquire knowledge on principles of Accounting, Journal, Ledger and Trial Balance
- CO2:** Preparing Financial statements also Accounting of intangible assets
- CO3:** Understanding Cost concepts with solved problems
- CO4:** Understanding Functional and Activity based budgeting, Standard costing and Variance analysis
- CO5:** Concentrating on Computerization of Accounts and GST Tally

**SUBJECT & CODE: 10915A – STATISTICS FOR MANAGERS**

- CO1:** To Understand the concept of Data and the rules of classification and tabulation
- CO2:** To understand the Measures of central tendency, dispersion and their application for business decision making

- CO3: To understand the concept of Correlation
- CO4: To know the concept of Regression
- CO5: To know the significance of probability in business application

**SUBJECT & CODE: 10916A – INFORMATION TECHNOLOGY FOR MANAGERS**

- CO1: To acquire basic Computer knowledge
- CO2: To understand the importance of Computer networks
- CO3: To acquire knowledge in Word processing and basics on common tools
- CO4: To obtain presentation skills through Power point Presentation
- CO5: To acquire knowledge on Ms-Excel

**SUBJECT& CODE: 10917AP-PERSONALITY DEVELOPMENT**

- CO1: To understand theories of Personality
- CO2: To Acquire knowledge on Assertiveness and Positive Attitude
- CO3: To Understand the concept of Motivation and Time Management

**SUBJECT& CODE: 10918AP-OFFICE AUTOMATION LAB**

- CO1: To test the ability of students hands on practice by doing exercises in word
- CO2: Creating presentations in Ms-Excel

**SEMESTER-II**

**SUBJECT & CODE: 20911A- HUMAN RESOURCE MANAGEMENT**

- CO1: To get awareness on Introduction of Human Resource Management
- CO2: To know the importance of Human Resource Development
- CO3: Understanding the concept of Performance Appraisal
- CO4: Understanding Motivation theories and how to manage human relations
- CO5: Identifying the importance of Organization Development and Human Resource Information System

**SUBJECT & CODE: 20912A –BUSINESS ENVIRONMENT**

- CO1: To acquire knowledge on the concept of Business Environment
- CO2: To understand Non Environmental factors
- CO3: Understanding the concept of Social change, Wave front analysis and Cultural Dynamics
- CO4: Knowing the importance of Economic system and LPG
- CO5: Understanding the concept of Monetary and Fiscal policy

### **SUBJECT & CODE : 20913A- FINANCIAL MANAGEMENT**

- CO1:** Gaining knowledge on Foundation of Finance
- CO2:** Doing financial analysis with Ratio, BEP, Funds flow and further financial planning and forecasting
- CO3:** To acquire knowledge on Working capital Management
- CO4:** Understanding Financial Operating Leverages, knowledge on capital structure theories and principles
- CO5:** Gaining knowledge on Capital budgeting methods, Risk analysis and Security analysis

### **SUBJECT & CODE: 20914A- PRODUCTION MANAGEMENT**

- CO1:** To understand the concept of Production Management
- CO2:** Gaining knowledge on Plant Location, Plant Layout and Plant Maintenance
- CO3:** Understanding the concepts of Production planning and control and Scheduling
- CO4:** To acquire knowledge on Material management and Models of Inventory
- CO5:** Focusing on importance of Quality Control

### **SUBJECT & CODE: 20915A- MARKETING MANAGEMENT**

- CO1:** Gaining awareness on Marketing concepts and Customer value
- CO2:** To improve knowledge on Consumer behaviour
- CO3:** Acquiring knowledge on the concepts of Product, Packaging and Branding
- CO4:** Focusing on Pricing methods and Marketing Communication
- CO5:** Understanding the concept of Distribution Management

### **SUBJECT & CODE: 20916A- BUSINESS RESEARCH METHODS**

- CO1:** To understand the importance of Business Research
- CO2:** Understanding sources and methods of gathering business information
- CO3:** To acquire knowledge on Decision Making tools
- CO4:** To identify Non-Parametric Statistics in Research
- CO5:** Understanding the concept of Multivariate analysis

### **SUBJECT& CODE: 20917AP- PRESENTATION SKILLS**

- CO1:** Developing knowledge on Presentation skills
- CO2:** Acquiring skills in Creating Visual Aids and delivering Presentation
- CO3:** To know the importance of Informative Presentation

### **SEMESTER-III**

#### **SUBJECT & CODE: 30911A- MANAGEMENT INFORMATION SYSTEM**

- CO1:** To know the concept of Management Information system
- CO2:** Gaining knowledge on MIS structures and development
- CO3:** Acquiring knowledge on Data Mining and Data Ware Housing
- CO4:** Understanding an Outline of Database Management System
- CO5:** Gaining knowledge on Functional Information System

#### **SUBJECT & CODE: 30912A- BUSINESS LAWS AND ETHICS**

- CO1:** Understanding the Emergence of Indian Business Law and its importance
- CO2:** Obtain knowledge on Formation of Contracts in business
- CO3:** Acquire knowledge on Sale of Goods Act
- CO4:** Clearly gains knowledge on Companies Act
- CO5:** Able to understand Ethics in Business and Corporate governance

#### **SUBJECT & CODE: 30913A- OPERATION RESEARCH**

- CO1:** To understand the concept of Operation research
- CO2:** Understanding Transportation, Travelling Salesman and Assignment problems
- CO3:** Understanding the concepts of Goal Programming, Business Applications and Game theory
- CO4:** Understanding the concept of Network analysis
- CO5:** To get awareness on queuing model

#### **SUBJECT & CODE: 30914AP- PROJECT REPORT EVALUATION**

- CO:** Evaluates challenges faced by students during implementation of project, lessons learned and suggestions given for future project implementation

#### **SUBJECT & CODE: 30915AP- INTERPERSONAL SKILLS & TEAM BUILDING**

- CO1:** Activity based learning on Personal growth, Character building, responsible citizenship & life span of development
- CO2:** Knowledge transfer through activities on Communication skills, team work & Leadership, peer pressure and refusal skills
- CO3:** Activity based learning on relationships

**SUBJECT & CODE: 30916AP- PROJECT VIVA**

**CO:** It helps to analyze self-appraisal, Strengths and Weakness of the project process and outcomes

**SUBJECT & CODE: 30917A- FINANCIAL MARKETS AND SERVICES**

- CO1:** To understand the Indian Financial system
- CO2:** Understands Securities market in India
- CO3:** Gains knowledge on Depository system and National Securities Depository Limited
- CO4:** Acquires knowledge on Insurance companies, RBI, and Commercial banks
- CO5:** Understanding Foreign Exchange Market

**SUBJECT & CODE: 30918A- MANAGEMENT OF EMPLOYEE RELATIONS**

- CO1:** Understanding the concept of Employee Relations
- CO2:** Acquiring knowledge on Prevention and Settlement of Industrial Conflicts
- CO3:** Understanding the importance of Trade Union in India
- CO4:** Obtaining knowledge on Discipline and Grievance Management
- CO5:** Acquiring knowledge on Empowerment and Quality Management

**SUBJECT & CODE: 30919A- HUMAN RESOURCE DEVELOPMENT**

- CO1:** Understanding the basic concept of HRD
- CO2:** Getting knowledge on HRD frame work process
- CO3:** Understanding Employee orientation and Socialization concepts
- CO4:** Develops knowledge on Employee development through counseling services
- CO5:** Understanding HRD Programme for Culturally diverse employees

**SEMESTER-IV**

**SUBJECT & CODE: 40911A- INTERNATIONAL BUSINESS MANAGEMENT**

- CO1:** Understanding the basic concepts of International Business Management
- CO2:** Acquiring knowledge on International trade regulatory frame work
- CO3:** Understanding International Financial frame work
- CO4:** Understanding Market selection and entry strategies
- CO5:** Obtaining knowledge on how to organize international business

**SUBJECT & CODE: 40912A- STRATEGIC MANAGEMENT**

- CO1:** Understanding the importance of Strategic Management
- CO2:** Acquiring knowledge on Strategy Formulation
- CO3:** Obtaining knowledge on Long term Objectives and Grand Strategies
- CO4:** Understanding the concept of Strategy implementation
- CO5:** Acquiring knowledge on Strategic Control processes

**SUBJECT & CODE: 40913A- ENTREPRENEURSHIP DEVELOPMENT**

- CO1:** To understand the importance of Entrepreneurship
- CO2:** Understanding the role and growth of SME sector
- CO3:** Obtaining knowledge on Creativity and Innovation in business
- CO4:** Acquires knowledge on Market and Demand Analysis
- CO5:** Obtain knowledge on Project Management

**SUBJECT & CODE: 40914AP- CAREER PLANNING & DEVELOPMENT**

- CO1:** Understanding the importance of career planning and development in life stages
- CO2:** To understand the importance of self analysis and career anchors
- CO3:** Acquires knowledge on resume preparation and interview process

**SUBJECT & CODE: 40915A- INTERNATIONAL FINANCIAL MANAGEMENT**

- CO1:** Acquire knowledge on Foreign Exchange Market
- CO2:** Understanding the concept of International Parity
- CO3:** Acquires knowledge on Foreign Exchange Risk Management
- CO4:** Obtain Knowledge regarding Cross border investments for foreign projects
- CO5:** Understanding the concept of Euro currency market

**SUBJECT & CODE: 40916A- INTERNATIONAL HUMAN RESOURCE  
MANAGEMENT**

- CO1:** Understanding the basic concepts of IHRM
- CO2:** Studying structural dynamics and evolution
- CO3:** Acquires knowledge on International Staffing
- CO4:** Obtain knowledge on need and importance of Cross Cultural Training
- CO5:** Understanding the effectiveness of People Management

**SUBJECT & CODE: 40917A- PERFORMANCE AND REWARD  
MANAGEMENT**

**CO1:** Understanding the concepts of Reward, Compensation and Non compensation systems

**CO2:** Understanding the job technical determinants

**CO3:** Obtain knowledge on Components of Pay and Fringe benefits

**CO4:** Understanding Performance based payment

**CO5:** Gains knowledge on statutory provisions and International pay system

# **D.R.W. COLLEGE (AUTONOMOUS) :: GUDUR**

## **DEPARTMENT OF COMPUTER SCIENCE**

**2018-19**

### **COURSE OUTCOMES**

## **MASTER OF COMPUTER APPLICATIONS(MCA)**

### **SEMESTER-III**

#### **30801A: SOFTWARE ENGINEERING**

**CO1:** To study the body of software engineering and process models

**CO2:** To acquire the knowledge and the concepts of Umbrella activities ,Measurement & Metrics in Software Engineering

**CO3:** TO be able to design the software by using the quality guideline and attributes and also analyzing the architecture

**CO4:** To know about the testing strategies like white Box ,Black Box etc

#### **30802A: DATABASE MANAGEMENT SYSTEM**

**CO1:** To understand the basic concepts of data base and also to design the database by using ER-Model

**CO2:** To gain the knowledge on relational model and also manipulate the data by relational algebra and calculus

**CO3:** To access the data by using SQL Queries cursors and Triggers

**CO4:** To learn about database base application development with JDBC and also the development of Internet Applications

### **30803: DATA COMMUNICATIONS AND COMPUTER NETWORKS**

**CO1:** To understand the fundamental concepts of Network models and physical layer concepts

**CO2:** To classify the media access control protocols and various Ethernet protocols

**CO3:** To demonstrate various Network layer protocols such as unicast and multicast protocols

**CO4:** To outline the mechanisms involved in transport layer and virtual private network

### **30804A: ADVANCED JAVA PROGRAMMING**

**CO1:** To Understand the basic concepts of J2EE with different implementations

**CO2:** To know the J2EE database concepts, JDBC Objects and embedded SQL

**CO3:** To acquire the knowledge on XML ,SERVLETS and JSP

**CO4:** To gain the knowledge of java beans ,CORBA and RMI

### **30805A: COMPUTER GRAPHICS**

**CO1 :** To have the basic concepts of computer graphics and to capture the knowledge on output primitives like point and lines, circle and ellipse algorithms

**CO3 :** To acquire the knowledge on 2-D geometric Transformations and 2-D Viewing

**CO4 :** To get the basic knowledge on 3-D geometric Transformations and 3-D Viewing

**CO5 :** To develop the applications by using Color models and Applying Animations

## **SEMESTER-IV**

### **40801A: DESIGN AND ANALYSIS OF ALGORITHMS**

- CO1:** To understand the basic concepts of analysis of algorithms and disjoint sets
- CO2:** To classify the different algorithm techniques of greedy method
- CO3:** To Develop algorithms for various computing problems
- CO5:** To demonstrate the branch and bound techniques for problem solving

### **40802A: SYSTEMS PROGRAMMING**

- CO1:** To understand the basic concept of system programming and assemblers
- CO2:** To gain the knowledge on Loaders and Linker concepts
- CO4:** To explain the concepts of micro processors
- CO5:** To grab knowledge of compilers and their functions

### **40803: WEB PROGRAMMING**

- CO1:** To gain the basic knowledge of Internet and XHTML
- CO2:** To develop programs by using the concept of Decision Control and Looping Statements using Javascript.
- CO3:** To make the student familiar with DHTML and implement the programs
- CO4:** To get the ability to do programs by using XML

### **40804: USER INTERFACE DESIGN**

- CO1:** To know the basic concepts of Human factors of interactive software and Expert reviews, usability testing, surveys and containing assessments
- CO2:** To acquire on the knowledge on Software tools and Command and natural languages
- CO3:** To gain the knowledge on Interaction Devices
- CO4:** To make the student familiar with Multiple Window strategies and Hyper Media and the World wide web

## **40804A: DATA MINING & DATA WAREHOUSING**

- CO1:** To know the fundamental concepts of Data mining and OLAP technology
- CO2:** To demonstrate the use of multidimensional model in data warehousing
- CO3:** To generate the association rules and differentiate the classification prediction algorithms
- CO4:** To gain the knowledge on various clustering algorithms and their applications

## **44444: INFORMATION & COMMUNICATION TECHNOLOGY-I**

- CO1:** To know the fundamental concepts of C- language
- CO2:** To develop the programs applying conditional and branching statements of C-programming
- CO3:** To acquire the knowledge on functions, storage classes and pointers of C-programming
- CO4:** To work with Arrays and files to develop programs.

## **SEMESTER-V**

### **50801: COMPUTER GRAPHICS**

- CO1 :** To have the basic concepts of computer graphics and to capture the knowledge on output primitives like point and lines, circle and ellipse algorithms
- CO3 :** To acquire the knowledge on 2-D geometric Transformations and 2-D Viewing
- CO4 :** To get the basic knowledge on 3-D geometric Transformations and 3-D Viewing
- CO5 :** To develop the applications by using Color models and Applying Animations

### **50802: OBJECT ORIENTED SYSTEMS DEVELOPMENT**

- CO1:** To get overview on OOAD concepts and various UML diagrams
- CO2:** To grab the knowledge on OO analysis and unified modeling language and patterns
- CO3:** To learn about access layer and view layer in OOAD
- CO4:** To acquire the knowledge on testing strategies and debugging concepts

### **50803: SYSTEMS PROGRAMMING**

- CO1:** To understand the basic knowledge on System software and assemblers
- CO2:** To gain the knowledge on loading and linkers and Macro processors
- CO3:** To gain the basic knowledge on compilers and system software
- CO4:** To know the in detail information about operating systems and device drivers
- CO5:** To know the knowledge on character driver 1&2 and Block drivers 1&2

### **50804 : DECISION SUPPORT SYSTEMS**

- CO1:** To understand basic concepts of decision support systems & information quality and models
- CO2:** To gain the knowledge on DSS architecture, Hardware and operating system platforms
- CO3:** To acquire the knowledge on Models in decision support systems & mathematical models and optimization.
- CO4:** To learn about various concept of Group decision support systems – expert systems.
- CO5:** To study on data warehousing and executive information system fundamentals

### **50805 : MULTIMEDIA SYSTEMS**

- CO1:** To gain the basic knowledge on Media and Data Streams, Sound/ Audio
- CO2:** To acquire on the knowledge on Video and Animation & Some Basic Compression Techniques
- CO3:** To get the knowledge on Optical Storage Media Basic Technology & Computer Technology
- CO4:** To make the student good at Multimedia operating Systems & Additional Operating System Issues
- CO5:** To gain the basic knowledge on Multimedia Communication Systems & Database Systems