Adusumilli Gopala krishnaiah & Sugar Cane Growers Siddhartha Degree
College ofArts & Science, Vuyyuru, Krishna District, Andhra Pradesh
(An Autonomous College in the Jurisdiction of Krishna University, Machilipatnam)
Accredited by NAAC with "A" GradeISO 9001:2015 Certified Institution

DEPARTMENT OF BOTANY

HIGHLIGHTED SYLLABUS OF BOTANY
2022-2023

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability   🟨

Skill-Development   🟦

Entrepreneurship   🟩

ODD SEM – I, III&V

Title of the Paper: **Fundamentals of Microbes and Non-vascular Plants** Semester: - I
Course code:BOTTIIA

Syllabus

Unit	Learning Units	Hours
I	**Origin of life and viruses** Origin of life, concept of primary Abiogenesis; Miller and Urey experiment. Five kingdom classifications of R.H. Whittaker. Discovery of micro- organisms, Pasteur experiments, germ theory of diseases. Shape and symmetry of viruses; structure of TMV and Gemini virus; multiplication of TMV, a brief account of Prions and Viroids. A general account on symptoms of plant diseases caused by Viruses. Transmission of plant viruses and their control. Significance of viruses in vaccine production, bio-pesticides and as cloning vectors.	12
II	**Special groups of Bacteria and Eubacteria** Brief account of Archaebacteria, Actinomycetes and Cyanobacteria. Cell structure and nutrition of Eubacteria. Reproduction- Asexual (Binary fission and endospores) and bacterial recombination.(Conjugation, Transformation, Transduction). Economic importance of Bacteria with reference to their role in Agriculture andindustry (fermentation and medicine). A general account on symptoms of plant diseases caused by Bacteria; Citrus canker.	12
III	**Fungi & Lichens** General characteristics of fungi and Ainsworth classification (up to classes). Structure, reproduction and life history of (a)*Rhizopus* (Zygomycota)and(b)*Puccinia* (Basidiomycota). Economic uses of fungi in food industry, pharmacy and agriculture. A general account on symptoms of plant diseases caused by Fungi; Blast of Rice. Lichens- structure and reproduction; ecological and economic importance.	12
IV	**Algae** General characteristics of Algae (pigments, flagella and reserve food material), Fritsch classification (up to classes). Thallus organization and life cycles in Algae. Occurrence, structure, reproduction and life cycle of (a)*Spirogyra* (Chlorophyceae) and (b) *Polysiphonia*(Rhodophyceae). Economic importance of Algae.	12
V	**Bryophytes** General characteristics of Bryophytes; classification up to classes. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of (a) *Marchantia*(Hepaticopsida) and (b) *Funaria*(Bryopsida). General account on evolution of sporophytes in Bryophyta.	12

ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165, KRISHNA Dt., A.P. (AUTONOMOUS).

NAAC reaccredited at 'A 'level

Autonomous –ISO 9001-2015 Certified

Title of the Paper: **(Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity)**

COURSE CODE:BOTT31A

Semester: - III

Course Details

Unit	Learning Units	Lecture Hours
I	**Anatomy of Angiosperms** Organization of apical meristems: Tunica-carpus theory and Histogen theory. Tissuesystems–Epidermal, ground and vascular. Anomalous secondarygrowth in *Boerhavia* and *Dracaena*. Study of timbers of economic importance-Teak, Redsanders and Rosewood.	12
II	**Embryology of Angiosperms** History of embryology, Structure of anther, types of tapetum. Microsporogenesis and development of male gametophyte. Structure of ovule, megaspore genesis; monosporic(*Polygonum*), bi sporic(*Allium*) and tetra sporic(*Peperomia*) types of embryo sacs. Outlines of pollination, pollen– pistil interaction and fertilization. Endosperm – Types and biological importance Freenuclear, cellular, helobial and ruminate. Development of Dicot(*Capsella bursa-pastoris*) embryo.	12
III	**Basics of Ecology** Ecology: definition, branches and significance of ecology. Ecosystem:Concept and components, energyflow, food chain, foodweb, ecological pyramids.Plants and environment: Climatic (light and temperature), edaphic and biotic factors. Ecological succession: Hydrosere and Xerosere.	12
IV	**Population, Community and Production Ecology** Population ecology: Natality, mortality, growth curves, ecotypes, ecads.Community ecology: Frequency, density, cover, lifeforms, biological spectrum.Concepts of productivity: GPP, NPP and Community Respiration. Secondary production, P/R ratio.	12
V	**Basics of Biodiversity** Biodiversity: Basic concepts, Convention on Biodiversity-Earth Summit. Value of Biodiversity; types and levels of biodiversity and Threats to biodiversity.Biodiversity Hot spots in India. Biodiversity in Eastern Ghats and Western Ghats.Principles of conservation:IUCN threat-categories, RED data book.Role of NBPGR and NBA in the conservation of Biodiversity.	12

Title of the Paper: **Plant tissue culture**   Semester: - V
COURSE CODE:SEC BOT-501/601

Syllabus

Unit	Learning Units	Lecture Hours
I	**Basic concepts of plant tissue culture** (10h) Plant tissue culture: Definition, history, scope and significance. Totipotency, differentiation, dedifferentiation, and redifferentiation; types of cultures. Infrastructure and equipment required to establish a tissue culture laboratory.	**10**
II	**Sterilization techniques and culture media (10h)** Aseptic conditions – Fumigation, wet and dry sterilization, UV sterilization, ultrafiltration. Nutrient media: Composition of commonly used nutrient culture media with respect to their contents like inorganic chemicals, organic constituents, vitamins, amino acids etc. Composition and preparationof Murashige and Skoog culturemedium	**10**
III	**Callus culture technique (10h)** Explant: Definition, different explants for tissue culture: shoot tip, axillary buds, leaf discs, cotyledons, inflorescence and floral organs, their isolation and surface sterilization; inoculation methods. **Callus culture**: Definition, various steps in callus culture. Initiation and maintenance of callus - Growth measurements and subculture; soma clonal variations.	**10**
IV	**Micropropagation (10h)** Direct and indirect morphogenesis, organogenesis, role of PGRs; somatic embryogenesis and synthetic seeds. Greenhouse hardening unit operation and management; acclimatization and hardening of plantlets - need, process, packaging, exports. Pathogen (Virus) indexing- significance, methods, advantages, applications.	**10**
V	**Applications of plant tissue culture (10h)** **Germplasm conservation: cryopreservation methods, slow growth, applications and limitations; cryoprotectants.** **Plant transformation techniques and bioreactors; production of secondary metabolites-optimization of yield, commercial aspects, applications, limitations.** **Transgenic plants- gene transfer methods; BT cotton.**	**10**

Title of the Paper: **Mushroom cultivation (7C)**   Semester: - V
Course Code :SECBOT-502/602

Syllabus

Unit	Learning Units	Lecture Hours
I	Mushrooms: Definition, structure of a mushroom and a brief account of life cycle; historical account and scope of mushroom cultivation; difference between edible and poisonous mushrooms. Morphological features of any four edible mushrooms, Button mushroom (*Agaricusbisporus*), Milky mushroom (*Calocybe indica*), Oyster mushroom (*Pleurotussajor-caju*) and Paddy straw mushroom (*Volvariellavolvacea*). Nutritional value of mushrooms; medicinal mushrooms in South India - Ganoderma lucidum, Phellinus rimosus, Pleurotus florida and Pleurotus pulmonaris – their therapeutic value; Poisonous mushrooms - harmful effects.	10
II	**Basic requirements of cultivation system** Small village unit and larger commercial unit; layout of a mushroom farm - location of building plot, design of farm, bulk chamber, composting, equipment and facilities, pasteurization room and growing rooms. **Compost and composting**: Definition, machinery required for compost making, materials for compost preparation. Methods of composting- long method of composting and short method of composting	10
III	**Spawning and casing** Spawn and spawning: Definition, facilities required for spawn preparation; preparation of spawn substrate. Preparation of pure culture, media used in raising pure culture; culture maintenance, storage of spawn.Casing: Definition, Importance of casing mixture, Quality parameters of casing soil, different types of casing mixtures, commonly used materials.	10
IV	**Mushroom cultivation** Raw material, compost, spawning, casing, cropping, and problems in cultivation (diseases, pests and nematodes, weed molds and their management strategies), picking and packing for any Four of the following mushrooms: (a) Button mushroom (b) Oyster mushroom (c) Milky mushroom and (d) Paddy straw mushroom.	10
V	**Post harvest technology** **Shelf life of mushrooms; preservation of mushrooms - freezing, dry freezing, drying and canning. Quality assurance and entrepreneurship - economics of different types of mushrooms; value added products of mushrooms.** **Management of spent substrates and waste disposal of various mushrooms.**	10

EVEN SEM – II, IV &VI

Title of the Paper: Basics ofVascularplantsandPhytogeography Course Code:BOTT21A
(Pteridophytes, Gymnoperms, Taxonomy ofAngiosperms and Phytogeography)   Semester : II

Syllabus

Unit	LearningUnits	Lecture Hours
I	**Pteridophytes** General characteristics of Pteridophyta; classification of Smith(1955)upto divisions. Occurrence,morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) *Lycopodium* (Lycopsida)and(b)*Marsilea*(Filicopsida). Stelarevolution in Pteridophytes Heterosporyandseedhabit.	12
II	**Gymnosperms** General characteristics of Gymnosperms; Sporne classification upto classes .Occurrence,morphology,anatomy, reproduction (developmental details are not needed) and life history of(a)*Cycas(Cycadopsida)*and(b)*Gnetum*(Gnetopsida). Outlines of geological timescale. A brief account on Cycadeoidea.	12
III	**BasicaspectsofTaxonomy** Aim and scope of taxonomy; Species concept:Taxonomic hierarchy,species,genusandfamily. Plant nomenclature: Binomial system, ICBN–rules for nomenclature. Herbariumanditstechniques,BSI herbarium and Kew herbarium;concept of digital herbaria. Bentham and Hooker system of classification Systematic description and economic importance of the following families :(a)Annonaceae(b)Curcurbitaceae.	12
IV	**SystematicTaxonomy** Systematic description andeconomic importance ofthefollowingfamilies: (a) Asteraceae (b)Ascleceae (c)Amaranthaceae,(d)Euphorbiacee (e)Orchidaceae,(f)Arecaceae(i)Poaceae Outlines of Angiosperm Phylogeny Group (APGIV).	12
V	**Phytogeography** Principles of Phytogeography, Distribution (wides, endemic,discontinuousspecies) Endemism–typesandcauses. Phytogeographic regions of World. Pytogeographic regions of India. Vegetation types in Andhra Pradesh.	12

Title of the Paper: **Plant Physiology and Metabolism**   Semester: IV

COURSE CODE:BOTT41A

Syllabus

Unit	Learning Units	Lecture Hours
I	**Plant-Water relations** 1. Importance of water to plant life, physical properties of water, diffusion, imbibitions, osmosis. Water potential, osmotic potential, pressure potential. 2. Absorption and lateral transport of water; Ascent of sap 3. Transpiration: stomata structure and mechanism of stomatalmovements(K^+ion flux). 4. Mechanism of phloem transport; source-sink relationships.	12
II	**Mineral nutrition, Enzymes and Respiration** Essentialmacroandmicromineralnutrientsandtheirroleinplants;symptomsof mineral deficiency Absorption of mineral ions; passive and active processes. Characteristics, nomenclature and classification of Enzymes. Mechanism of enzyme action, enzyme kinetics. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, Mechanism of oxidative phosphorylation, Pentose Phosphate Pathway (HMPshunt).	12
III	**Photosynthesis and Photorespiration** Photosynthesis:Photosyntheticpigments,absorptionandactionspectra;Reddrop and Emerson enhancement effect Conceptoftwophotosystems;mechanismofphotosyntheticelectrontransport and evolution of oxygen; photo phosphorylation Carbon assimilation pathways (C3, C4 and CAM); Photorespiration-C2 pathway	12
IV	**Nitrogen and lipid metabolism** Nitrogen metabolism: Biological nitrogen fixation– asymbiotic and symbiotic nitrogen fixing organisms. Nitrogenase enzyme system. Lipid metabolism: Classification of Plant lipids, saturated and unsaturated fatty acids. Anabolism of triglycerides, β-oxidation of fatty acids, Glyoxylate cycle.	12
V	**Plant growth-development and stress physiology** Growth and Development: Definition, phases and kinetics of growth. Physiological effect of Plant Growth Regulators(PGRs)- Auxins, Gibberellins, Cytokinins, ABA, Ethylene and Brassino steroids. Physiology of flowering: Photoperiodism, role of phytochrome in flowering. Seed germination and senescence; physiological changes.	12

Title of the Paper: **Cell Biology, Genetics and Plant Breeding**   **Course Code:BOTT42A**
Syllabus

Unit	Learning Units	Lecture Hours
I	**The Cell** 1. Cell theory; prokaryotic vs eukaryotic cell; animal vs plant cell; a brief account on ultra-structure of a plant cell. 2. Ultra-structure of cell wall. 3. Ultra-structure of plasma membrane and various theories on its organization. 4. Polymorphic cell organelles (Plastids); ultra structure of chloroplast. Plastid DNA.	12
II	**Chromosomes** 1. Prokaryotic vs eukaryotic chromosome. Morphology of a eukaryotic chromosome. 2. Euchromatin and Heterochromatin; Karyotype and ideogram. 3. Brief account of chromosomal aberrations - structural and numerical changes 4. Organization of DNA in a chromosome (solenoid and nucleosome models).	12
III	**Mendelian and Non-Mendelian genetics** 1. Mendel's laws of inheritance. Incomplete dominance and co-dominance; Multiple allelism. 2. Complementary, supplementary and duplicate gene interactions (plant-based examples are to be dealt). 3. A brief account of linkage and crossing over; Chromosomal mapping - 2 point and 3-point test cross. 4. Concept of maternal inheritance (Corren's experiment on *Mirabilis jalapa*);	12
IV	**Structure and functions of DNA** 1. Watson and Crick model of DNA. Brief account on DNA Replication (Semi-conservative method). 2. Brief account on Transcription, types and functions of RNA. Gene concept and genetic code and Translation. 3. Regulation of gene expression in prokaryotes - Lac Operon.	12
V	**Plant Breeding** 1. Plant Breeding and its scope; Genetic basis for plant breeding. Plant Introduction and acclimatization. 2. Definition, procedure; applications and uses; advantages and limitations of :(a) Mass selection, (b) Pure line selection and (c) Clonal selection. 3. Hybridization – schemes, and technique; Heterosis (hybrid vigour). 4. A brief account on Molecular breeding – DNA markers in plant breeding. RAPD, RFLP.	12

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DEPARTMENT OF CHEMISTRY

HIGHLIGHTED SYLLABUS OF CHEMISTRY
2022-2023

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability

Skill-Development

Entrepreneurship

Title of the Paper: Inorganic&PhysicalChemistry   Semester: I (60 Hr)

Course code: CHET11A

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
	INORGANICCHEMISTRY 24h	
I	**Chemistry ofp-blockelements** 1.1 Group 13: Preparation & structure of Diborane, Borazine 1.2 Group 14: Preparation, classification and uses of silicones 1.3 Group 15: Preparation & structures of Phosphonitrilic halides {(PNCl2)nwheren=3, 4 1.4 Group 16: Oxides and Oxoacids of Sulphur (structures only) 1.5 Group 17: Pseudohalogens, Structures of Interhalogen compounds.	**8h**
II	**Chemistry ofd-blockelements:** **2.1** Characteristics of d-block elements with special reference to electronic configuration, **2.2** variable valence, magnetic properties, catalytic properties **2.3** and ability to form complexes. Stability of various oxidationstates.	**6h**
	Chemistry off-blockelements: **2.4** Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, **2.5** Magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, 2.6 actinide contraction, comparison of lanthanides and actinides.	**6h**
	Theories of bondinginmetals: **2.7** Valence bond theory and free electron theory, explanation of thermal and electrical conductivity of metals based on these theories, **2.8** Band theory- formation of bands, **2.9** Explanations of conductors, semiconductors and insulators.	**4h**

	Physical Chemistry **36h**	
III	**Solid State** **3.1** Symmetry in crystals. Law of constancy of interfacial angles. **3.2** The law of rationality of indices. The law of symmetry. Miller indices, **3.3** Definition of lattice point, space lattice, unit cell. Bravais lattices and crystal systems. **3.4** X-ray diffraction and crystal structure. Bragg's law. Powder method. Defects in crystals. **3.5** Stoichiometric and non-stoichiometric defects.	**10h**
IV	**Gaseousstate** **4.1** van der Waal's equation of state. Andrew's isotherms of carbon dioxide, continuity of state. **4.2** Critical phenomena. Relationship between critical constants and vander Waal's constants. **4.3** Law of corresponding states. Joule- Thomson effect. Inversion temperature.	**6h**
	Liquidstate **4.4** Liquid crystals,mesomorphicstate. Differences between liquid crystal and solid/liquid. **4.5** Classification of liquid crystals into Smectic and Nematic. **4.6** Application of liquid crystals as LCD devices.	**4h**
V	**Solutions, Ionic equilibrium& dilute solutions** **Solutions** **5.1**Azeotropes-HCl-H_2O system and ethanol-water system. Partially miscible liquids-phenol- water system. **5.2** Critical solution temperature (CST), Effect of impurity on consulate temperature. Immiscible liquids and steam distillation.Nernst distribution law. **5.3** Calculation of the partition coefficient. Applications of distribution law.	**6h**
	Ionicequilibrium **5.4** Ionic product, common ion effect, solubility and solubility product. **5.5** Calculations based on solubility product.	**3h**
	Dilutesolutions **5.6** Colligative properties- RLVP, Osmotic pressure, Elevation in boing point and depression in freezing point. **5.7** Experimental methods for the determination of molar mass of a non-volatile solute using osmotic pressure, **5.8** Elevation in boiling point and depression in freezing point. Abnormal colligative properties. Van't Hoff factor.	**7h**

Practical-I   **ANALYSIS OF SALT MIXTURE**   (At the end of Semester-I)

(Minimum of Six mixtures should be analyzed)

Credits:2

30hrs(2 h /w)

10M+40M =50M

Title of the Paper: ORGANIC CHEMISTRY & SPECTROSCOPY

Semester: III (60 Hr)

Course Code: CHET31A

Syllabus

Unit	Learning Units	Lecture Hours
I	**Chemistry of Halogenated Hydrocarbons** Alkyl halides: Methods of preparation and properties, nucleophilic substitution reactions– SN^1, SN^2 and SN^i mechanisms with stereo chemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination, Williamson's synthesis. Arylhalides: Preparation (including preparation from diazonium salts) and properties, nucleophilic aromatic substitution; S_NAr, Benzyne mechanism. Relative reactivity of alkyl, allyl, benzyl,vinyl and aryl halides towards nucleophilic substitution reactions. **Alcohols & Phenols** Alcohols: preparation, properties and relative reactivity of 1°, 2°, 3° alcohols, Bouvaelt Blanc Reduction; Oxidation of diols by periodic acid and lead tetra acetate,Pinacol- Pinacolone rearrangement; Lucas Reagent Phenols: Preparation and properties; Acidity and factors effecting it, Ring substitution reactions, Reimer–Tiemannand Kolbe's–Schmidt Reactions, Fries and Claisen rearrangements with mechanism;	**12 Hrs**
	Carbonyl Compounds Structure, reactivity, preparation and properties; Nucleophilic additions, with $NaHSO_3$, Formation of alcohols, HCN , Grignard's Reagent(Rmgx), hemi acetol's, Fehling's, Tollen's, 2 4 Di Nitro Phenyl hydrazine (2 4 DNPH) and formation of oximesNucleophilic addition-elimination reactions with ammonia derivatives Mechanisms of Aldol and Benzoin condensation,	**10 hrs**

II	Claisan-Schmidt, Perkin, Cannizzaro and Wittig reaction, Beckmann halo form reaction and Baeyer Villiger oxidation, α- substitution reactions,oxidations and reductions (Clemmensen, wolf – kishner, with LiAlH4 &NaBH4). Addition reactions of α,β-unsaturated carbonyl compounds: Michael addition. Active methylene compounds: Keto- Enoltautomerism. Preparation and synthetic applications of diethyl malonate and ethyl aceto acetate.	
III	**Carboxylic Acids and their Derivatives** General methods of preparation, physical properties and reactions of mono carboxylic acids, effect of Substituents on acidic strength.Typical reactions of dicarboxylic acids, hydroxyl acids and unsaturated acids. Preparation and reactions of acid chlorides, anhydrides,esters and amides; Comparative study of nucleophilic substitution at acyl group-Mechanism of acidic and alkaline hydrolysis of esters, Claisen condensation, Reform at sky reactions and Curtius rearrangement Reactions involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by Huns-Diecker reaction, de carboxylation by Schimdt reaction, Arndt- Eistert synthesis, halogenation by Hell- Volhard- Zelinsky reaction.	**12 hrs**
IV	**Molecular Spectroscopy**: Interaction of electromagnetic radiation with molecules and various types of spectra; **Rotation spectroscopy:** Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution. **Vibrational spectroscopy:** Classical equation of vibration, computation of force constant, Harmonic and an harmonic oscillator, Morse potential curve,vibrational degrees of freedom molecules, modes of vibration. Selection rules for vibrational transitions, Fundamental frequencies, overtones and hotbands. **Electronic spectroscopy:** Energy levels of molecular orbitals (σ, π, n). Selection rules for electronic spectra. Types of electronic transitions in molecules, effect of conjugation. Concept of chromophore. Bathochromic	**18 hrs**

	and hypsochromicshifts.Beer-Lambert's law and its limitations.	
	Nuclear Magnetic Resonance (NMR) spectroscopy: Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.	
V	**Application of Spectroscopy to Simple Organic MoleculesApplication of visible, ultraviolet and Infrared spectroscopy in organic molecules.** Application of electronic spectroscopy and Woodward rules for calculating λmax of conjugated dienes and α,β – unsaturated compounds. Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on >C=O stretching absorptions).	**8 hrs**

Laboratory Course-III

Semester: III   **Credits: 1**

Hours Taught: 30 hrs. (2hr/W)   **Max.Time** : 2 Hours

Syllabus

Course Details

Unit	Learning Units	Practical Hours
I	**Organic preparations:** i. Acetylation of one of the following compounds: amines (aniline, o-, m-, ptoluidines and o-, m-, p-anisidine) and phenols (β-naphthol, vanillin, salicylic acid) by any one method: a. Using conventional method. b. Using green approach ii. Benzolyation of one of the following amines (aniline, o-, m-, p- toluidines and o-, m-, p-anisidine) iii. Nitration of any one of the following: a. Acetanilide/nitrobenzene by conventional method b. Salicylic acid by green approach (using ceric ammonium nitrate).	**20 Hr**
II	**IR Spectral Analysis** IR Spectral Analysis of the following functional groups with examples a) Hydroxyl groups b) Carbonyl groups c) Amino groups d) Aromatic groups	**10Hr**

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION REVISED
UG SYLLABUS UNDER CBCS
(Implemented from Academic Year, 2020-21)
PROGRAMME: FOUR YEAR B.Sc.(Hons)
Domain Subject: CHEMISTRY
Skill Enhancement Courses (SECs) for Semester V, from 2022-23
(Syllabus with Learning Outcomes, References, Co-curricular Activities & Model Q.P. Pattern)
Structure of SECs for Semester–V (To choose One pair from the Five alternate pairs of SECs)

Note-1: For Semester–V, for the domain subject Chemistry, any one of the five pairs of SECs shall be chosen as courses 6 and 7, i.e., 6A&7A or 6B&7B or 6C&7C or 6D&7D or 6E&7E.The pair shall not be broken (ABC allotment is random, not on any priority basis).

Note-2: One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the skills embedded in syllabus citing related real field situations

Title of the Paper: Analytical Methods in Chemistry-I

Course Code: CHE-501C-6B   Semester: V

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Quantitativeanalysis-1** (Marks Weightage-10+5+5) 1. Abriefintroduction to analytical methodsinchemistry 2. Principles of volumetric analysis, concentration terms- Molarity, Normality,v/v, w/v, ppm and ppb, preparing solutions- Standard solution, primary standards andsecondarystandards. 3. Description and use of common laboratory apparatus- volumetric flask, burette, pipette,beakers,measuringcylinders.	**10Hr**
II	**Quantitativeanalysis-2** (Marks Weightage-10+10+5) 1. Principles of volumetric analysis: Theories of acid-base (including study of acid-basetitration curves), redox, complexometric, iodometric and precipitation titrations-choiceofindicators for thesaturations. 2.Principlesofgravimetricanalysis:precipitation,coagulation,peptization,co-precipitation, post precipitation, digestion, filtration, and washing of precipitate, dryingandignition.	**12Hr**
III	**Treatmentofanalyticaldata** (Marks Weightage-10+10+5) Types of errors- Relative and absolute, significant figures and its importance, accuracy –methods of expressing accuracy, errors- Determinate and indeterminate and minimization oferrors,precision-methodsofexpressingprecision,standarddeviation and confidencelimit.	**8Hr**
IV	**Separationtechniques** (Marks Weightage-10+10+5+5) 1. SolventExtraction:Introduction,principle,techniques,factorsaffectingsolventextraction, Batchextraction,continuousextractionandcountercurrentextraction.Synergism.Application-Determination ofIron(III). 2. IonExchangemethod:Introduction,actionofionexchangeresins,applications	**5Hr**
V	**Analysis of water (Marks weightage 10+5)** Determination of dissolved solids, total hardness of water, turbidity, alkalinity, Dissolved oxygen, COD, determination of chloride using Mohr's method	**10Hr**

Practical Paper – V **Analytical methods in chemistry-I** **Practical syllabus**	**PAPER CODE : CHE-501 P** **ACADEMIC YEAR-2022-2023**

AnalyticalmethodsinChemistry-1-PRACTICALSYLLABUS
(SkillEnhancementCourse(Elective),Credits:02)

Practical Hrs ;45 (3hr/W)

II Practical(Laboratory) Syllabus :(30hrs)

1. Estimationof Iron(II)usingstandardPotassium dichromatesolution (usingDPAindicator)

2. Estimationoftotal hardnessof waterusingEDTA

3. DeterminationofchlorideionbyMohr'smethod

4. Study the effect on pH of addition of HCl/NaOH to solutions of acetic acid, sodium acetate and theirmixtures.

5. Preparation of buffer solutions of different pH (i) Sodium acetate-acetic acid, (ii) Ammonium chloride-ammoniumhydroxide.

6. pHmetrictitrationof(i)strongacid vs.strongbase,(ii)weakacidvs. strongbase.

7. Determinationofdissociationconstantofaweakacid.

Title of the Paper: Analytical Methods in Chemistry-2 Semester: V

Course Code: CHE-502C-7B

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Chromatography-Introductionandclassification (Marks weightage 10+5)** Principle,Classificationofchromatographicmethods,Natureofadsorbents,eluents,$R_f$values,factors affecting$R_f$values.	**7hr**
II	**TLCand paperchromatography (Marks weightage 10+10+5+5)** 1. Thin layer chromatography: Principle, Experimental procedure, preparation of plates,adsorbents and solvents, development of chromatogram, detection of spots, applicationsandadvantages. 2. Paper Chromatography: Principle, Experimental procedure, choice of paper andsolvents, various modes of development- ascending, descending, radial and twodimensional, applications.	**12**hr
III	**Columnchromatography (Marks weightage 10+10+5)** 1. Column chromatography: Principle, classification, Experimental procedure, stationaryandmobilephases, developmentoftheChromatogram,applications, factors affecting the column efficiency. 2. Applications:- Separation of .Methylene Blue and Flurocene by column chromatography.	**10 Hr**
IV	**Gaschromatography: (Marks weightage 10+5+5)** Basic principles. Different types of GC techniques. Selection of columns and carrier gases.Instrumentation. Detectors-Thermal conductivity detector, Flame ionization detector,$R_f$values.Applicationsintheseparationof amino acids &estrogens	**8 hr**
V	**HighPerformanceliquidchromatography (HPLC) (Marks weightage 10+10+5)** Basic principles.NormalandreversedPhases.Selectionofcolumnandmobilephase.Instrumentation.Detectors- RID, UV detector$R_f$values.Applicationsintheseparation,separation of anions, barbiturates, tropane alkaloids.	**8 Hr**

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
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PRACTICAL SYLLABUS
Laboratory Course-VII

Practical Paper – V **Analytical methods in chemistry-2** **Practical syllabus**	**PAPER CODE : CHE-502 P** **ACADEMIC YEAR-2022-2023**

AnalyticalmethodsinChemistry-2
PRACTICALSYLLABUS

(SkillEnhancementCourse(Elective),Credits:02)

Practical Hrs./Week: 3

II Practical(Laboratory)Syllabus:(30hrs)

1. Separation of a given dye mixture (methyl orange and methylene blue) using TLC (usingaluminaas adsorbent).

2. **Separationof different amino acids using paperchromatography.**

3. Separation of given mixture of amino acids (glycine and phenyl alanine) using ascendingpaperchromatography.

4. **Estimation of Fe^{+2} by using thiocynate by calorimeter.**

5. **SeparationofsugarsusingTLC**

6. Verification of Beer lambert's law. (Using potassium permanganate solution) usingcolorimeter/spectrophotometer.

SEMESTER – III (SDC)	PAPERCODE:SDCCHET01
PAPER TITLE : FOOD ADULTERATION	

UNIT-I: Total: 30Hrs (2h/week)   02 Credits

CommonFoodsandAdulteration(10+10+5+5)   10Hrs

Common Foods subjected to Adulteration-Adulteration-Definition –Types;Poisonous substances,Foreign matter, cheapsubstitutes, Spoiled parts.Adulteration through Food Additives –Intentional and incidental.General Impact on Human Health.

UNIT-II :

Adulteration of Common Foods and Methods of Detection (10+10+5+5)   10Hrs

Means of Adulteration Methods of Detection Adulterants in the following Foods; Milk,Oil, Grain, Sugar,Spices and Condiments, Processed Food, Fruits and Vegetables.Additives and Sweetening agents (at least three methods of detection for each food item).

UNIT-III:

PresentLawsandProceduresonAdulteration(10+10)   10Hrs

Highlights of Food Safety and Standards Act 2006 (FSSA) –Food Safety and Standards Authority of India- Rules and Procedures of Local Authorities.Role of Voluntary Agencies Suchas,Agmark, I.S.I. Quality control laboratories of Companies, Private testing laboratories, Quality control laboratories of Consumer co-operatives.

Consumer Education, Consumer's problems, rights and responsibilities, COPRA2019-Offenses and Penalities-Procedures to Complain –Compensation to Victims.

Title of the Paper: ORGANIC AND GENERALCHEMISTRY   Semester: II

Course Code: CHE-201C

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
	ORGANIC CHEMISTRY	
I	**Recapitulation of Basics of Organic Chemistry Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes)** **1.1** General methods of preparation of alkanes- Wurtz and Wurtz - Fittig reaction, Corey House synthesis, physical and chemical properties of alkanes, Isomerism and its effect on properties. **1.2** Free radical substitutions; Halogenation, concept of relative reactivity v/s selectivity. **1.3** Conformational analysis of alkanes (Conformations, relative stability and energy diagrams of Ethane, Propane and butane). **1.4** General molecular formulae of cycloalkanes and relative stability, Baeyer strain theory, Cyclohexane conformations with energy diagram, Conformations of mono substituted cyclohexane.	**12h**
II	**Carbon-CarbonpiBonds(AlkenesandAlkynes)** **2.1** Generalmethodsofpreparation,physicaland chemicalproperties. **2.2** \Mechanism ofE1,E2,E1CB reactions,SaytzeffandHoffmanneliminations, Electrophilic Additions,mechanism(Markownikoff/Antimarkownikoffaddition) with suitable examples, *syn*and*anti*-addition;additionofH_2,X_2, HX. oxymercuration-9, demercuration, hydroboration-oxidation, ozonolysis, Hydroxylation , Diels alder reaction , 1,2 and 1,4 addition reaction in Conjugated Dienes. **2.3**Reactionsofalkynes;acidity,electrophilic andnucleophilicadditions,hydrationtoformcarbonyl compounds,Alkylationof terminalalkynes.	**12h**
III	**Benzene and its reactivity** **3.1** Concept of aromaticity, Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenylcation, cyclopentadienyl anion and tropyliumcation)	12h

	3.2 Reactions - General mechanism of electrophilic aromatic substitution, mechanism of nitration, Friedel- Craft's alkylation and acylation. **3.3** Orientation of aromatic substitution - ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO_2 and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens (Explanation by taking minimum of one example from each type)	
GENERAL CHEMISTRY	
IV	**Surface chemistry and chemical bonding** **1. Surface chemistry** **4.1 Colloids-** Coagulation of colloids- Hardy-Schulze rule. Stability of colloids, Protection of Colloids, Gold number. **4.2 Adsorption-**Physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption. **2. Chemical Bonding** **4.3** Valence bond theory, hybridization, VB theory as applied to ClF_3**,** $Ni(CO)_4$ **4.4** Molecular orbital theory -LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N_2, O_2, CO and NO). **3. HSAB** **4.5** Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.	14h
V	**Stereochemistry of carbon compounds** **5.**1 Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae. **5.2** Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation. **5.3** Chiral molecules- definition and criteria(Symmetry elements)- Definition of enantiomers and diastereomers – Explanation of optical isomerism with examples- Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3-dibromopentane. **5.4** D, L, R,S and E,Z- configuration with examples. Definition of Racemic mixture – Resolution of racemic mixtures (any 3 techniques)	10h

PRACTICAL SYLLABUS

Practical Paper – II Volumetric Analysis	PAPER CODE : CHEP-21A ACADEMIC YEAR-2022-23

30 hrs (2h/w)   Credits-2

Course outcomes:

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

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

2. Understand and explain the volumetric analysis based on fundamental concepts learnt in ionic Equilibria

3. Learn and identify the concepts of a standard solutions, primary and secondary standards

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

Volumetric analysis 50 M

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.

2. Determination of Fe (II) using $KMnO_4$ with oxalic acid as primary standard.

3. Determination of Cu (II) using $Na_2S_2O_3$ with $K_2Cr_2O_7$ as primary standard

4. Estimation of water of crystallization in Mohr's salt by titrating with $KMnO_4$

Title of the Paper: INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY

Course Code: CHE-401C

Semester: IV

Syllabus

Unit	Learning Units	Lecture Hours
	INORGANIC CHEMISTRY	
I	**Organometallic Compounds** Definition and classification of organometallic Compounds on the basis of bond type, Concept of hapticity of organic ligands. Metal carbonyls: 18 electron rule, electron count of mononuclear, poly nuclear and substituted metal carbonyls of 3d series. General methods of preparation of mono and binuclear carbonyls of 3d series. P-acceptor behavior of carbon monoxide. Synergic effects (VB approach) - (MO diagram of CO can be referred to for synergic effect to IR frequencies).	**8h**
	ORGANIC CHEMISTRY	
II	**Carbohydrates** Occurrence, classification and their biological importance, Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation; Disaccharides– Elementary treatment of maltose, lactose and sucrose. Polysaccharides–Elementary treatment of starch.	**8h**
III	**1. Amino acids and proteins** Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, valine and leucine) by following methods: a) from halogenated carboxylic acid b) Gabriel Phthalimide synthesis c)	**6h**

strecker's synthesis.

Physical properties: Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.

Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating- peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.

2. Heterocyclic Compounds

Introduction and definition: Simple five membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1, 4, -dicarbonyl compounds, Paul-Knorr synthesis. Properties: Acidic character of pyrrole - electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan. Pyridine – Structure - Basicity - Aromaticity- Comparison with pyrrole- one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction

7h

Nitrogen Containing Functional Groups

Preparation, properties and important reactions of nitro compounds, amines and diazonium salts.

1. Nitrohydrocarbons

Nomenclature and classification-nitro hydrocarbons, structure -Tautomerism of nitroalkanes leading to aci and keto form, Preparation of Nitroalkanes, reactivity - halogenation, reaction with HONO (Nitrous acid),Nef reaction and Mannich reaction leading to Micheal addition and reduction.

3h

IV

2. Amines

Introduction, classification, chirality in amines (pyramidal inversion), importance and general methods of preparation.

Properties : Physical properties, Basicity of amines: Effect of substituent, solvent and steric effects. Distinction between Primary,Secondary and tertiary amines using Hinsberg's method and nitrous acid.

Discussion of the following reactions with emphasis on the mechanistic

pathway: Gabriel Phthalimide synthesis, Hoffmann-Bromamide reaction, Carbylamine reaction, Mannich reaction, Hoffmann'sexhaustive methylation, Hofmann-elimination reaction and Cope-elimination.

11h

	Diazonium Salts: Preparation and Synthetic applications of diazonium salts including preparation of arenes, haloarenes, phenols, cyano and nitro compounds. Coupling reactions of diazonium salts (preparation of azo dyes).	
V	**1.Photochemistry** Difference between thermal and photochemical processes, Laws of photochemistry- Grothus- Draper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield- Photochemical reaction mechanism- hydrogen- chlorine and hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence, Jablonski diagram, Photosensitized reactions- energy transfer processes (simple example). **Thermodynamics** The first law of thermodynamics-statement, definition of internal energy and enthalpy, Heat capacities and their relationship, Joule-Thomson effect- coefficient, Calculation of work for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes, State function. Temperature dependence of enthalpy of formation- Kirchoff s equation, Second law of thermodynamics Different Statements of the law, Carnot cycle and its efficiency, Carnot theorem, Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes. Third law of thermodynamics, Nernst heat theorem, Spontaneous and non-spontaneous processes, Helmholtz and Gibbs energies-Criteria forspontaneity.	**5h** **12h**

PRACTICAL SYLLABUS.

Practical Paper – IV	PAPER CODE :
OrganicQualitativeanalysis	**ACADEMIC YEAR-2022-23**

30 hrs (2h/w)   **Credits-2**

OrganicQualitativeanalysis   **50 M**

Analysis of an organic compound through systematic qualitative procedure for functional group identification including the determination of melting point and boiling point with suitable derivatives.

Alcohols, Phenols, Aldehydes, Ketones, Carboxylic acids, Aromatic primary amines, amides and simple sugars.

Title of the Paper: INORGANIC&PHYSICALCHEMISTRY

Semester: IV

COURSE CODE: CHE-402C

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
	INORGANICCHEMISTRY	**26h**
I	**Coordination Chemistry** IUPAC nomenclature of coordination compounds, Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Valence Bond Theory (VBT): Inner and outer orbital complexes. Limitations of VBT, Crystal field effect, octahedral symmetry. Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Tetrahedral symmetry, Factors affecting the magnitude of crystal field splitting energy, Spectro chemical series, Comparison of CFSE for Octahedral and Tetrahedral complexes, Tetragonal distortion of octahedral geometry, Jahn-Teller distortion, square planar coordination.	**12h**
II	**1. Inorganic Reaction Mechanism** Introduction to inorganic reaction mechanisms. Concept of reaction pathways, transition state, intermediate and activated complex. Labile and inert complexes, ligand substitution reactions SN^1 and SN^2, Substitution reactions in square planar complexes, Trans-effect, theories of trans effect and itsapplications **2. Stability ofmetalcomplexes** Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method. **3. Bioinorganic Chemistry** Metal ions present in biological systems, classification of elements according to their action in biological system. Geochemical effect	**4h** **2h**

	on the distribution of metals, Sodium K- pump, carbonic anhydrase andcarboxy peptidase. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg,Pb,Cd and As), reasons for toxicity, Use of chelating agents in medicine, Cis-platin as an anti-cancer drug. Iron and its application in bio-systems, Hemoglobin, Myoglobin.Storage and transfer of iron.	**8h**
	PHYSICALCHEMISTRY	**34h**
III	**1 .Phase rule** Concept of phase, components, degrees of freedom. Thermodynamic derivation of Gibbs phase rule. Phase diagram of one component system - water system, Study of Phase diagrams of Simple eutectic systems i) Pb-Ag system, desilverisation of lead ii) NaCl-Water system, Congruent and incongruent melting point- Definition and examples for systems having congruent and incongruent melting point , freezing mixtures.	**6h**
IV	**Electrochemistry** Specific conductance, equivalent conductance and molar conductance- Definition and effect of dilution. Cell constant. Strong and weak electrolytes, Kohlrausch's law and its applications, Definition of transport number, determination of transport number by Hittorf's method. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only), Application of conductivity measurements- conductometrictitrations. Electrochemical Cells- Single electrode potential, Types of electrodes with examples: Metal- metal ion, Gas electrode, Inert electrode, Redox electrode, Metal-metal insoluble salt- salt anion. Determination of EMF of a cell, Nernst equation, Applications of EMF measurements - Potentiometric titrations. Fuel cells- Basic concepts, examples and applications	**14h**
V	**Chemical Kinetics:** The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction, Derivation of integrated rate equations for zero, first	**14h**

| | and second order reactions (both for equal and unequal concentrations of reactants). Half–life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only). Enzyme catalysis- Specificity, factors affecting enzyme catalysis, Inhibitors and Lock & key model. Michaels- Menten equation- derivation, significance of Michaelis-Menten constant. | |

A.G.&S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE (AUTONOMOUS), VUYYURU.

(Accredited at "A" Grade by NAAC, Bangalore)

PRACTICAL SYLLABUS

Practical Paper – V	PAPER CODE : CHE-402P
Conductometric andPotentiometric Titrimetry	ACADEMIC YEAR-2022-23

30 hrs (2 h/W)   Credits: 2

Practical-Course –V

Conductometric andPotentiometric Titrimetry   50 M

Conductometric and Potentiometric Titrimetry

1.Conductometric titration- Determination of concentration of HCl solution using standard NaOHsolution.

2.Conductometric titration- Determination of concentration of CH3COOH Solution using standard NaOHsolution.

3.Conductometric titration- Determination of concentration of CH3COOH and HCl in a mixture using standard NaOHsolution.

4.Potentiometric titration- Determination of Fe (II) using standard $K_2Cr_2O_7$solution.

Determination of rate constant for acid catalyzed esterhydrolysis

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION REVISED
UG SYLLABUS UNDER CBCS
(Implemented from Academic Year, 2020-21)
PROGRAMME: FOUR YEAR B.Sc.(Hons)
Domain Subject: CHEMISTRY
Skill Enhancement Courses (SECs) for Semester V/VI, from 2022-23
(Syllabus with Learning Outcomes, References, Co-curricular Activities & Model Q.P. Pattern)
Structure of SECs for Semester–V (To choose One pair from the Five alternate pairs of SECs)

Univ. Code	Course NO. 6&7	Name of Course	Th. Hrs ./ Week	IE Marks	EE Mar -ks	Credi ts	Prac. Hrs. /W k	Ma r- ks	Credits
	6A	Synthetic Organic Chemistry	3	25	75	3	3	50	2
	7A	Analysis of Organic Compounds	3	25	75	3	3	50	2

OR

| | 6B | Analytical Methods in Chemistry-1 | 3 | 25 | 75 | 3 | 3 | 50 | 2 |
| | 7B | Analytical Methods in Chemistry-1 | 3 | 25 | 75 | 3 | 3 | 50 | 2 |

OR

| | 6C | Industrial Chemistry-1 | 3 | 25 | 75 | 3 | 3 | 50 | 2 |
| | 7C | Industrial Chemistry-2 | 3 | 25 | 75 | 3 | 3 | 50 | 2 |

OR

| | 6D | EnvironmentalChemistry | 3 | 25 | 75 | 3 | 3 | 50 | 2 |
| | 7D | Green Chemistry and Nanotechnology | 3 | 25 | 75 | 3 | 3 | 50 | 2 |

OR

| | 6E | Analytical Methods in Chemistry | 3 | 25 | 75 | 3 | 3 | 50 | 2 |
| | 7E | Cosmetics and Pharmaceutical Chemistry | 3 | 25 | 75 | 3 | 3 | 50 | 2 |

Note-1: For Semester–V/VI, for the domain subject Chemistry, any one of the five pairs of SECs shall be chosen as courses 6 and 7, i.e., 6A&7A or 6B&7B or 6C&7C or 6D&7D or 6E&7E.The pair shall not be broken (ABC allotment is random, not on any priority basis).
Note-2: One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the skills embedded in syllabus citing related real field situations

Title of the Paper: Analytical Methods in Chemistry-I Semester: V/VI

Course Code: CHE-501C-6B

Syllabus

Course Details

Unit	Learning Units
I	**Quantitativeanalysis-1** 1. Abriefintroduction to analytical methodsinchemistry 2. Principles of volumetric analysis, concentration terms- Molarity, Normality,v/v, w/v, ppm and ppb, prepar... andsecondarystandards. 3. Description and use of common laboratory apparatus- volumetric flask, burette, pipette,beakers,measuring...
II	**Quantitativeanalysis-2** 1. Principles of volumetric analysis: Theories of acid-base (including study of acid-basetitration cu... choiceofindicators for thesaturations. 2. Principlesofgravimetricanalysis:precipitation,coagulation,peptization,co-precipitation, post precipitation, d...
III	**Treatmentofanalyticaldata** Types of errors- Relative and absolute, significant figures and its importance, accuracy –methods of expre... oferrors,precision-methodsofexpressingprecision,standarddeviation and confidencelimit.
IV	**Separationtechniques** 1. SolventExtraction:Introduction,principle,techniques,factorsaffectingsolventextraction,Batchextraction... Determination ofIron(III). 2. IonExchangemethod:Introduction,actionofionexchangeresins,applications
V	**Analysis of water (Marks weightage 10+5)** Determination of dissolved solids, total hardness of water, turbidity, alkalinity, Dissolved oxygen, COD, dete...

Practical Paper – V Analytical methods in chemistry-I Practical syllabus	PAPER CODE : CHE-501 P ACADEMIC YEAR-2022-2023

AnalyticalmethodsinChemistry-1-PRACTICALSYLLABUS

(SkillEnhancementCourse(Elective),Credits:02)

Practical Hrs ;45 (3hr/W)

II Practical(Laboratory) Syllabus :(**30hrs**)

1. Estimationof Iron(II)usingstandardPotassium dichromatesolution (usingDPAindicator)

2. Estimationoftotal hardnessof waterusingEDTA

3. DeterminationofchlorideionbyMohr'smethod

4. Study the effect on pH of addition of HCl/NaOH to solutions of acetic acid, sodium acetate and theirmixtures.

5. Preparation of buffer solutions of different pH (i) Sodium acetate-acetic acid, (ii) Ammonium chloride-ammoniumhydroxide.

6. pHmetrictitrationof(i)strongacid vs.strongbase,(ii)weakacidvs. strongbase.

7. Determinationofdissociationconstantofaweakacid.

II LabReferences:

1. TextbookofVogel'sQuantitativeChemicalAnalysis,Sixth edition,Pearson.

Title of the Paper: Analytical Methods in Chemistry-2

Semester: V/VI

Syllabus

Unit	Learning Units	Lecture Hours
I	**Chromatography-Introductionandclassification** (Marks weightage 10+5) Principle,Classificationofchromatographicmethods,Natureofadsorbents,eluents,$R_f$values,factors affecting$R_f$values.	**7hr**
II	**TLCand paperchromatography** **(Marks weightage 10+10+5+5)** 1. Thin layer chromatography: Principle, Experimental procedure, preparation of plates,adsorbents and solvents, development of chromatogram, detection of spots, applicationsandadvantages. 2. Paper Chromatography: Principle, Experimental procedure, choice of paper andsolvents, various modes of development- ascending, descending, radial and twodimensional, applications.	**12**hr
III	**Columnchromatography** (Marks weightage 10+10+5) 1. Column chromatography: Principle, classification, Experimental procedure, stationaryandmobilephases, developmentoftheChromatogram,applications, factors affecting the column efficiency. 2. Applications:- Separation of .Methylene Blue and Flurocene by column chromatography.	**10 Hr**
IV	**Gaschromatography:** (Marks weightage 10+5+5) Basic principles. Different types of GC techniques. Selection of columns and carrier gases.Instrumentation. Detectors-Thermal conductivity detector, Flame ionization detector,$R_f$values.Applicationsintheseparationof amino acids &estrogens	**8 hr**
V	**HighPerformanceliquidchromatography (HPLC)** (Marks weightage 10+10+5) Basic principles.NormalandreversedPhases.Selectionofcolumnandmobilephase.Instrumentation.Detectors- RID, UV detector$R_f$values.Applicationsintheseparation,separation of anions, barbiturates, tropane alkaloids.	**8 Hr**

PRACTICAL SYLLABUS

Laboratory Course-VII

Practical Paper – V **Analytical methods in chemistry-2** **Practical syllabus**	**PAPER CODE : CHE-502 P** **ACADEMIC YEAR-2022-2023**

Analytical methodsinChemistry-2

PRACTICALSYLLABUS

(SkillEnhancementCourse(Elective),Credits:02)

Practical Hrs./Week: 3

II Practical(Laboratory)Syllabus:(**30hrs**)

1. Separation of a given dye mixture (methyl orange and methylene blue) using TLC (usingaluminaas adsorbent).

2. **Separationof different amino acids using paperchromatography.**

3. Separation of given mixture of amino acids (glycine and phenyl alanine) using ascendingpaperchromatography.

4. **Estimation of Fe^{+2} by using thiocynate by calorimeter.**

5. **SeparationofsugarsusingTLC**

6. Verification of Beer lambert's law. (Using potassium permanganate solution) usingcolorimeter/spectrophotometer.

SEMESTER – III (SDC)	**PAPERCODE:SDCFA201**
PAPER TITLE : FOOD ADULTERATION	

UNIT-I: Total: 30Hrs (2h/week)   02 Credits

CommonFoodsandAdulteration(10+10+5+5)   **10Hrs**

Common Foods subjected to Adulteration-Adulteration-Definition –Types;Poisonous substances,Foreign matter, cheapsubstitutes, Spoiled parts.Adulteration through Food Additives –Intentional and incidental.General Impact on Human Health.

UNIT-II :

Adulteration of Common Foods and Methods of Detection (10+10+5+5)   **10Hrs**

Means of Adulteration Methods of Detection Adulterants in the following Foods; Milk,Oil, Grain, Sugar,Spices and Condiments, Processed Food, Fruits and Vegetables.Additives and Sweetening agents (at least three methods of detection for each food item).

UNIT-III:

PresentLawsandProceduresonAdulteration(10+10)   **10Hrs**

Highlights of Food Safety and Standards Act 2006 (FSSA) –Food Safety and Standards Authority of India- Rules and Procedures of Local Authorities.Role of Voluntary Agencies Suchas,Agmark, I.S.I. Quality control laboratories of Companies, Private testing laboratories, Quality control laboratories of Consumer co-operatives.

Consumer Education, Consumer's problems, rights and responsibilities, COPRA2019-Offenses and Penalities-Procedures to Complain –Compensation to Victims.

Adusumilli Gopalakrishnaiah & Sugar Cane Growers Siddhartha Degree College of
Arts & Science, Vuyyuru– 521165, Krishna District, Andhra Pradesh
(An Autonomous College in the Jurisdiction of Krishna University, Machilipatnam)
Accredited by NAAC with "A" Grade   **ISO 9001:2015 Certified Institution**

DEPARTMENT OF PG CHEMISTRY

2022-23

HIGHLIGHTED SYLLABUS OF PG CHEMISTRY

Courses on Employability, Entrepreneurship and Skill-Development in the curriculum of all programs are highlighted as mentioned: Employability in yellow Color, Skill-Development in Sky blue colour and Entrepreneurship in Green colour

Employability

Skill-Development

Entrepreneurship

A.G.& S.G.SIDDHARTHADEGREE COLLEGE OF ARTS & SCIENCE

M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)

I SEMESTER

W.E.F 2022-23 (R22 Regulations)

Title of the Paper: GENERAL CHEMISTRY

Course Code: 22CH1T1

Syllabus

Unit	Learning Units	Lecture Hours
I	**Treatment of analytical data** : Classification of errors – Determinate and indeterminate errors –Minimisation of errors – Accuracy and precision – Distribution of random errors – Gaussian distribution – Measures of central tendency – Measures of precision – Standard deviation – Standard error of mean – student's t test – Confidence interval of mean – Testing for significance – Comparison of two means – F – test – Criteria of rejection of an observation – propagation of errors – Significant figures and computation rules – Control charts – Regression analysis – Linear least squares analysis.	12
II	**Titrimetric Analysis:**Classification of reactions in titrimetric analysis- Primary and secondary standards-Neutralisation titrations-Theory of Neutralization indicators-Mixed indicators-Neutralisation curves-Displacement titrations-Precipitation titrations-Indicators for precipitation titrations-Volhard method-Mohr method- Theory of adsorption indicators-Oxidation reduction titrations-Change of electrode potentials during titration of Fe(II) with Ce(IV)- Detection of end point in redox titrations-Complexometric titrations- Metal ion indicators-Applications of EDTA titrations-Titration of cyanide with silver ion.	12
III	**Visible spectro photometry** – Theory of spectrophotometry and colorimetry, Beer-Lambert's law - Deviations from Beers law. Classification of methods of colour measurement or comparison (standard series method, Duplication method, Dilution method, photoelectric-photometer method, spectrophotometer method)-Instrumentation – Applications-determination of phosphates, chlorides, Iron, Manganese, chromium - Photometric titrations-Spectrophotometric determination of pK value of an indicator.	12
IV	**Symmetry and Group theory in Chemistry I** Symmetry elements [Rotational axis of symmetry (C_n), Plane of Symmetry(σ) amd Classification ofplanes of symmetry i.e., Vertical plane(σ_v) Dihedral Plane(σ_d) and Horizontal Plane(σ_h), Improperrotational axis of symmetry(S_n), Inversion centre or Centre of symmetry(i) and Identityelement(E)]. Identification of possible symmetry elements in the molecules H_2O, NH_3 , BF_3 , CH_4 ,$[PtCl_4]^{-2}$, C_6H_6 , symmetry operation, Axioms of group theory- definition of group, sub group(Trivial and non-trivial sub groups), GMT tables-construction of GMT table Abelian(C_{2v}) and non abelian groups(C_{3v}), relation between order of a finite group and its sub group. Point symmetry group. Schoenflies symbols, Group generating elements, Classification of molecules- MLS, MHS,& MSS. Procedure to Find out Point group of a molecule (yes or no Method),	12
V	**Symmetry and Group theory in Chemistry II** Representation of groups by Matrices (representation for the Cn, C_nv, C_nh, Dn etc. groups to be worked out explicitly). Definition of Class and importance of similarity transformation in identifying symmetry class with c_3v as example, Character of a representation. Reducible and Irreducible representations - Mulliken notations for Irreducible representations The great orthogonality theorem (without proof) and its importance. Character tables and their use.Construction of Character table (C_{2v} and C_{3v} only). Application of group theory in IR and Raman spectroscopy taking H_2O, NH_3, BF_3 examples. Mutual Exclusion principle with special reference to cis N_2F_2 and trans N_2F_2.	12

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
DEPARTMENT OF CHEMISTRY
M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
I SEMESTER
W.E.F 2022-23 (R22 Regulations)

Title of the Paper: INORGANIC CHEMISTRY
Course Code: 22CH1T2

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction to Exact Quantum Mechanical Results:** Schrodinger equation, importance of wave function, Operators, Eigen values and Eigen functions, derivation of wave equation using operator concept. Discussion of solutions of Schrodinger's equation to some model systems viz. particle in one dimensional box (applications), three-dimensional box, Rigid rotator system and the Hydrogen atom. Variation theorem, linear variation principle, perturbation theory (first order and non-degenerate), Application of variation method to the Hydrogen atom.	12
II	**Chemistry of non- transition elements:** Halogen oxides and oxyfluorides, Spectral and Magnetic properties of Lanthanides and Actinides. Analytical applications of Lanthanides and Actinides. Synthesis, properties and structure of B-N, S-N, P-N cyclic compounds. Intercalation compounds. **Metal π- complexes:** preparation, structure and bonding in Nitrosyl, Dinitrogen and Dioxygencomplexes.	12
III	**Structure and Bonding:** pπ-dπ bonding, Bent's rule, Non-valence cohesive forces, VSEPR theory. Molecular Orbital theory, Molecular orbitals in triatomic (BeH_2) molecules and ions (NO_2^-) and energy level diagrams. Walsh diagrams for linear (BeH_2) and bent (H_2O) molecules.	12
IV	**Metal–ligand bonding:** Crystal Field Theory of bonding in transition metal complexes-Splitting of d-orbitals in octahedral, tetrahedral, square planar, Trigonal bipyramidal and Square pyramidal fields. Tetragonal distortions - Jahn-Teller effect. Applications and limitations of CFT. Experimental evidences for covalence in complexes. Molecular Orbital Theory of bonding for Octahedral, tetrahedral and square planar complexes. π-bonding and MOT - Effect of π - donor and π -acceptor ligands on Δo. Experimental evidence for π - bonding in complexes.	12
V	**Metal – ligand Equilibria in solutions:** Step wise and over all formation constants. Trends in stepwise formation constants (statistical effect and statistical ratio). Determination of formation constants by Spectrophotometric method (Job's method) and pH metric method (Bjerrum's). Stability correlations - Irwing -William's series. Hard and soft acids and bases (HSAB).	12

A.G.& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)

I SEMESTER
W.E.F 2022-23 (R22 Regulations)

Title of the Paper: ORGANIC CHEMISTRY
Course Code: 22CH1T3
Syllabus

Unit	Learning Units	Lecture Hours
I	**Nature of bonding:** Localised and Delocalized, Delocalised chemical bonding conjugation, cross conjugation, hyper conjugation, Tautomerism. **Aromaticity**: Concept of Aromaticity, Aromaticity of five membered, six membered rings - Non benzonoid aromatic compounds:-cyclopropenylcation, Cyclobutadienyldication, cyclopentadienyl anion-tropyllium cation and cyclooctatetraenyl dianion. Homoaromaticity, Anti aromaticity	12
II	**Reactive intermediates & Reactive Species:** **Reactive intermediates:**Generation, Structure, Stability, Detection and Reactivity of Carbocations, Carbanions, Free radicals, Carbenes, Nitrenes and Arynes. **Reactive Species:** Generation and reactivity of Electrophiles, Nucleophiles, Dienophiles, Ylids.	12
III	**Addition Reactions:** Additions: Addition to carbon – carbon multiple bonds, HX, X2, HOX, stereo chemistry of addition, formation and reaction of epoxides, syn and anti hydroxylation, hydrogenation(catalytic and Non catalytic), synthetic reactions of CO and CN and Cram's rule.	12
IV	**Eliminations Reactions**: elimination, pyrolytic eliminations. Types of elimination (E1, E1cB, E2) reactions, mechanisms, stereochemistry and orientation, Hofmann and Saytzeff's rules, Syn elimination versus anti elimination. Competitions between elimination and substitution.Dehydration, dehydrogenation, dehalogenation, decarboxylative	12
V	**Substitution Reactions:** **Aliphatic Nucleophilic substitutions:**The SN^2, SN^1, mixed SN^1 and SN^2 and SN^ireactions : Mechanism, effect of structure, nucleophile, leaving group on substitutions. The neighbouring group mechanism, participation by $\sigma$and πbonds, anchimeric assistance. **Aromatic Nucleophilic substitution:**The SN^{Ar} (Addition – Elimination), SN^1(Ar)mechanisms and benzyne mechanism (Elimination – Addition). Reactivity- effect of substrate structure, leaving group and attacking nucleophile. The Von-Richter, Sommelet – Hauser and Smiles rearrangements.	12

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M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
I SEMESTER
W.E.F 2022-23 (R22 Regulations)

Title of the Paper: PHYSICAL CHEMISTRY
Course Code: 22CH1T4

Syllabus

Unit	Learning Units	Lecture Hours
I	**Thermodynamics – I** Classical thermodynamics - Brief review of first and second laws of thermodynamics - Entropy change in reversible and irreversible processes - Entropy of mixing of ideal gases - Entropy and disorder – Free energy functions - Gibbs-Helmholtz equation - Maxwell partial relations - Conditions of equilibrium and spontaneity - Free energy changes in chemical reactions: Van't Hoff reaction isotherm - Van't Hoff equation - Clausius Clapeyron equation - partial molar quantities - Chemical potential - Gibbs- Duhem equation - partial molar volume - determination of partial molar quantities - Fugacity - Determination of fugacity - Thermodynamic derivation of Raoult's law.	12
II	**Surface phenomena and phase equilibria** - Surface tension - capillary action - pressure difference - across curved surface (young - Laplace equation) - Vapour pressure of small droplets (Kelvin equation) - Gibbs-Adsorption equation - BET equation - Estimation of surface area - catalytic activity of surfaces – ESCA , X- ray fluorescence and Auger electron spectroscopy. **Surface active agents** - classification of surface active agents - Micellization - critical Micelle concentration (CMC) - factors affecting the CMC of surfactants, microemulsions - reverse micelles - Hydrophobic interaction.	12
III	**Electrochemistry – I -** Electrochemical cells - Measurement of EMF - Nernst equation – Equilibrium constant from EMF Data - pH and EMF data - concentration cells with and without transference – Liquid junction potential and its determination - Activity and activity coefficients - Determination by EMF Method - Determination of solubility product from EMF measurements. Debye Huckel limiting law and its verification.Effect of dilution on equivalent conductance of electrolytes - Anomalous behaviour of strong electrolytes. Debye Huckel-Onsagar equation - verification and limitations, conductometric titrations.	12
IV	**Chemical kinetics**- Methods of deriving rate laws - complex reactions - Rate expressions for opposing, parallel and consecutive reactions involving unimolecular steps. Theories of reaction rates -collision theory - Steric factor - Activated complex theory - Thermodynamic aspects – Unimolecular reactions - Lindemann's theory - Lindemann-Hinshelwood theory. Reactions in solutions - Influence of solvent - Primary and secondary salt effects - Elementary account of linear free energy relationships - Hammet - Taft equation - Chain reactions - Rate laws of H_2-Br_2, photochemical reaction of H_2 - Cl_2, Decomposition of acetaldehyde and ethane - Rice-Herzfeld mechanism.	12
V	**Potentiometry:** Advantages of potentiometric methods - Reference electrode - Standard hydrogen electrode .Acid- alkali or Neutralisation titration, Oxidation – reduction titrations, Precipitation titrations, complexometric titrations, Methods of end point location (Graphical, Differentiation method, Pinkhof- Treadwell method). Calomel electrode -Indicator electrodes: Metal-metal ion electrodes - Inert electrodes -Membrane electrodes - theory of glass membrane potential - Direct potentiometry, potentiometric titrations - Applications.	12

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M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
I SEMESTER
W.E.F 2022-23 (R22 Regulations)

Title of the Paper: PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS

Course Code: 22PG101

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction to Personality Development:-**The concept of personality - Dimensions of Personality – Theories of Personality development (Freud & Erickson) – The concept of Success and Failure – Factors responsible for Success – Hurdles in achieving Success and Overcoming Hurdles — Causes of failure – Conducting SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis.	12
II	**Attitude, Motivation and Self-esteem**:-Conceptual overview of Attitude – Types of Attitudes – Attitude Formation – Advantages/Disadvantages of Positive/Negative Attitude - Ways to Develop Positive Attitude. **Concept of motivation:** Definition and Nature of Motivation/Motive – Internal and external motives – Theories of Motivation – Importance of self- motivation- Factors leading to de- motivation. **Self-esteem**: - Definition and Nature of self-esteem – Do's and Don"ts to develop positive self- esteem – Low self esteem - Personality having low self esteem - Positive and negative self esteem.	12
III	**Other Aspects of Personality Development:-** Body language - Problem-solving - Conflict Management and Negation skills - Decision-making skills - Leadership and qualities of a successful leader – Character building -Team-work – Time management - Work ethics – Good manners and etiquette – Emotional Ability/Intelligence – Dimensions of Emotional Intelligence – Building Emotional Intelligence.	12
IV	**Neetisatakam-Holistic Development of Personality:** Verses- 19,20,21,22 (wisdom) – Verses- 29,31,32 (pride and heroism) – Verses- 26,28,63,65 (virtue) **Personality of Role Model – Shrimad Bhagwadgeeta** Chapter2-Verses 17 – Chapter 3-Verses 36,37,42 – Chapter 4-Verses 18, 38,39 – Chapter18 – Verses 37,38,63.	12
V	**Yoga & Stress Management :**Meaning and definition of Yoga - Historical Perspective of Yoga - Principles of Astanga Yoga by Patanjali – Meaning and Definition of Stress - Types of Stress - Eustress and Distress –Stress Management – Pranayama-Pranayama: Anulom and Vilom Pranayama - Nadishudhi Pranayama - Kapalabhati-Pranayama - Bhramari Pranayama - Nadanusandhana Pranayama – Meditation techniques: Om Meditation - Cyclic meditation : Instant Relaxation technique (QRT), Quick Relaxation Technique (QRT), Deep Relaxation Technique (DRT) (Theory & Practical).	12

PRACTICAL COMPONENTS:

☐ Students should identify different types of personality to know their own personality. Students are to describe the characteristics of their personalities and submit the same for assessment.

☐ Students are to form in groups (a group consists of 4-6 students) to identify and write a brief note on famous personalities of India and World.

☐ Students are required to identify different types of attitudes and give any five examples of each.

☐ Students are expected to check their attitudes and develop ways to improve their attitudes at work place and home.

☐ Students are required to identify keys to self-motivation to achieve theirgoals.

☐ Students are expected to identify at least seven types of body language and conduct

activities with the following:

S. No.	Pose	Possible Interpretations
1	Standing with your hands on your hips	Aggressive, disgusted
2	Standing upright	Confidence
3	Arms crossed on your chest	Defensive
4	Resting your hand on your cheek	Thinking
5	Touching or rubbing your nose	Doubt, lying
6	Resting your head in your hands	Boredom, tired
7	Tapping your fingers	Impatience
8	Biting your nails	Nervous, insecure
9	Playing with your hair	Insecure
10	Rubbing your eyes	Disbelief, doubt

- **Conduct the following exercise to develop communication skills – Negotiation Skills and Empathy**

Exercise: Card Pieces

In this activity, team members trade pieces of playing cards to put together complete cards.
Uses **-This exercise is useful for showing team members others' perspectives. It builds communication and** negotiation skills**, and helps people to develop** empathy**.**

People and Materials

- Enough people for at least three teams oftwo.

- Playing cards – use between four and six for each person.

- A privateroom.

Time -15minutes.
Instructions:
1. Cut each playing card into half diagonally, then in half diagonally again, so youhave four triangular pieces for each card.
2. Mix all the pieces together and put equal numbers of cards into as many envelopes as you have teams.
3. Divide people up into teams of three or four. You need at least three teams. Ifyou're short of people, teams of two will work just as well.
4. Give each team an envelope of playing card pieces.
5. Each team has three minutes to sort its pieces, determine which ones it needs to make complete cards, and develop a bargaining strategy.
6. After three minutes, allow the teams to start bartering for pieces. People can barter on their own or collectively with their team. Give the teams eight minutes to barter.
7. When the time is up, count each team's completed cards. Whichever team has the most cards wins the round.

Advice for the Teacher/Facilitator

After the activity, ask your team members to think about the strategies they used. Discuss these questions:
1) Which negotiation strategies worked? Which didn't?
2) What could they have done better?
3) What other skills, such as **active listening** or **empathy**, did they need touse ?

- **Conduct following Time management activity - Ribbon ofLife**

    Take a colored ribbon length of approximately 1 meter/100 cm. and scissors. Start with the followingquestions:

    1. If the life span of an individual is say, 100 years. Consider that each cm represents one year. The response will be that few live that long. Assuming a life of 75 to 90 years, cut 10 to 25 cm off the ribbon,accordingly.
    2. What is the average age of the participants sitting here, the response would be 25 to 30 depending on the group, in that case, cut another 25 cms of the ribbon and say that is gone you cannot do anything.
    3. What is left is 50 years? People will say, "Yes," but the answer isNO.
    4. Every year we have 52 weeks, that is 52 Sundays. If we multiply that by 50 years, it comes to 7.14 years. Reduce the ribbon by another 7.14cm.
    5. We also usually have Saturdays off, so reduce another 7.cms.
    6. Public/National holidays are 10 multiple with 50 years. That comes to another 1.5 years. Reduce ribbon by another 1.5cms.
    7. Your casual leave, sick leave, and annual holidays approx. 40 days a year, multiplied by 50. Cut off another 5 cms. Now you are left with about 29.5 years. But, the calculation is not overyet.
    8. You sleep an average of 8 hours daily; multiply that by 365 days and again by 50 years (i.e. 122 days X 50 = almost 17 years). Cut off another 17cm.
    9. You spend time eating lunch, breakfast, snacks, and dinner total 2 hours daily (i.e. 30 days a year X 50 years= 4 years or so). Cut off another 4cm.
    10. Last, let"s figure we spend about 1 hour a day travelling from place to place for activitiesandsuch.(that"sabout2moreyears).We"redownto6(SIX)yearsoflife to make it or breakit.

Exercise Decision making skills - Create Your Own

In this exercise, teams must create their own, brand new, problem-solving activity.
Uses
This game encourages participants to think about the problem-solving process. It builds skills such as creativity, negotiation and decision making, as well as communication and time management. After the activity, teams should be better equipped to work together, and to think on their feet.

What You'll Need

- Ideally four or five people in each team.
- A large, private room.
  Paper, pens and flipcharts

Time -Around one hour.

Instructions:

1. As the participants arrive, you announce that, rather than spending an hour on a problem-solving team building activity, they must design an original one of their own.

2. Divide participants into teams and tell them that they have to create a new problem- solving team building activity that will work well in their organization. The activity must not be one that they have already participated in or heardof.

3. After an hour, each team must present their new activity to everyone else, and outline its keybenefits.

4. Advice for theTeacher/Facilitator:
There are four basic steps in problem solving: defining the problem, generating solutions, evaluating and selecting solutions, and implementing solutions. Help your team to think creativelyat each stage by getting them to consider a wide range of options. If ideas run dry, introduce an alternative brainstorming technique, such as brainwriting . This allows your people to develop one others' ideas, while everyone has an equal chance tocontribute.
After the presentations, encourage teams to discuss the different decision-makingprocesses they followed. You might ask them how they communicated and managedtheir time . Another question could be about how they kept their discussion focused. And to round up, you might ask them whether they would have changed their approach after hearing the other teams' presentations.
Studentsareaskedtoreciteverses:26,28,63,65(virtue)ofNeetisatakam-Holisticdevelopment of personality.

Students are asked to identify personality of role Mmodels from Shrimad Bhagwadgee ta and portray the roles of the same.
Students are asked to practice Yoga and meditation techniques

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
I SEMESTER
W.E.F 2022-23 (R22 Regulations)

Title of the Paper: Practical – I – Inorganic Chemistry Practical (22CH1L1)

List of experiments:

1. Preparation of Potassium trisoxalato ferrate (III).	(CO – 3, L - 3)
2. Preparation of Tris thiourea copper (1) sulphate.	(CO – 4, L - 4)
3. Preparation of Cis and trans potassium diaquodioxalato chromate (III).	(CO – 3, L - 3)
4. Preparation of Hexa ammine cobalt (III) chloride.	(CO – 4, L - 4)
5. Determination of Zn^{2+} with potassium ferro cyanide.	(CO – 3, L - 3)
6. Determination of Mg^{2+} using EDTA.	(CO – 4, L - 4)
7. Determination of Ni^{2+} using EDTA.	(CO – 3, L - 3)
8. Determination of hardness of water using EDTA.	(CO – 4, L - 4)
9. Gravimetric determination of nickel using dimethyl glyoxime.	(CO – 3, L - 3)

10. Gravimetric determination of Zn using diammonium hydrogen phosphate. (CO – 4, L - 4)

11. Semi micro qualitative analysis of six radical mixtures   (CO – 4, L - 4)
    (One interfering anion and one less familiar cation for each mixture)
    (minimum three mixtures).

Anions: S^{2-} , SO_3^{2-} , Cl^-, Br^-, I^- , NO_3^- , SO_4^{2-}, CH_3COO^-, $C_2O_4^{-2}$, $C_4H_4O_6^{-2}$, PO_4^{3-}, CrO_4^{2-},BO_3^{3-}

Cations: Ammonium (NH_4^+)

1st group: Ag^+, Pb^{+2}, W^{+6}

2nd group: Pb^{+2}, Bi^{+3}, Cu^{+2}, Cd^{+2}, Sn^{+2}, Sn^{+4} , Mo^{+6}.

3rd group: Fe^{+2}, Fe^{+3}, Al^{+3}, Cr^{+3}, Ce^{+4}, Th^{+4}, Zr^{+4}, VO^{+2}, Be^{+2}.

4th group: Zn^{+2}, Mn^{+2}, Co^{+2}, Ni^{+2}.

5th group: Ca^{+2}, Ba^{+2}, Sr^{+2}.

6th group: Mg^{+2}, K^+, Li^+.

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M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)

I SEMESTER

W.E.F 2022-23 (R22 Regulations)

Title of the Paper: Organic Practical-I (22CH1L2)

List of experiments:

1. Separation of Binary mixtures of Carboxylic acid + Neutral organic compounds (Solvent extraction method).   (CO – 3, L - 3)
2. Separation of Binary mixtures of Basic nature + Neutral organic compounds (Solvent Extraction method).   (CO – 3, L - 3)
3. Separation of Binary mixtures of Phenolic compounds + Neutral organic compounds Solvent extraction method).(CO – 3, L - 3)
4. Preparation of Phthalimide from Phthalic anhydride – High Temperature.   (CO – 3, L - 3)
5. Preparation of p-nitro acetanilide – Low temperature.   (CO – 3, L - 3)
6. Preparation of Iodoform – Room temperature.   (CO – 3, L - 3)
7. Paper chromatography - separate the given mixture of sugars.   (CO – 4, L - 4)
8. Paper chromatography - separate the given mixture of amino acids.   (CO – 4, L - 4)
9. Thin layer chromatography - separate the given mixture of phenols   (CO – 4, L - 4)
10. Thin layer chromatography - separate the given mixture of 2,4-DNP derivatives of carbonyls compounds.   (CO – 4, L - 4)

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NAAC reaccredited at 'A'level

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Title of the Paper: ADVANCED ORGANIC SPECTROSCOPY

Semester:III

Course Code: 20CH3T1

Syllabus

Unit	Learning Units	Lecture Hours
I	**Proton NMR Spectrscopy**: Determination of structure of organic compounds using PMR data. Spin system, Nomenclature of spin system, spin system of simple and complex PMR spectrum (Study of AB – A2 – AB2. ABX – ABC – AMX interactions) Simplification of complex spectra- nuclear magnetic double resonance, chemical shift reagents, solvent effects on PMR Spectrum . Nuclear Overhauser Effect (NOE).	12
II	**13C-NMR spectroscopy:** Similarities and Difference between PMR and CMR-CMR recording techniques - BBC-BBD-SFORD-Gate pulse CMR spectrum. General considerations, chemical shift (aliphatic, olefinic, alkyne, aromatic, heteroaromatic and carbonylcarbon), coupling constants.Typical examples of CMR spectroscopy – simple problems.	12
III	**ORD& CD Curves:** Optical rotatory dispersion : Theory of optical rotatory dispersion – Cotton effect –CD curves-types of ORD and CD curves- similarities and difference between ORD and CD curves. α- Halo keto rule, Octant rule – application in structural studies.	12
IV	**2D NMR spectroscopy:** Definitions and importance of COSY, DEPT, HOMCOR, HETCOR,INADEQUATE, INDOR, INEPT, NOESY, HOM2DJ, HET2DJ. Study of COSY ,DEPT, HOMCOR, HETCOR, INADEQUATE INDOR INEPT ,NOESY HOM2DJ, HET2DJ, taking simple organic compounds as examples.	12
V	Structural Elucidation of Organic compounds Using UV, IR, 1H-NMR, 13C-NMR and Mass spectroscopy.	12

Title of the Paper: ORGANIC REACTIONS & MECHANISMS
Semester: III
Course Code: 20CH3T2

Syllabus

Unit	Learning Units	Lecture Hours
I	**Oxidations** Definition and types of Oxidations, oxidations with ruthenium tetroxide, NBS, iodobenzenediacetate, Tl(III) nitrate, Chromium (VI) oxidants, Lead tetra acetate, SeO_2, MnO_2, Ag_2CO_3, Oppenauer oxidation, perhydroxylation using $KMnO_4$, OsO_4, HIO_4, oxidation with iodine silver carboxylate (Woodward and Prevostconditions), Definition & mechanism of epoxidation by peracids.	12
II	**Reductions** Definition and types of reductions, reduction by dissolving metals - Reduction with metal and liquid ammonia (Birch Reduction of aromatic compounds), Reduction with metal acid - Clemensons reduction, Reduction by hydride transfer reagents, Aluminiumalkoxide - MeerweinPondorfVerley Reduction, $LiAlH_4$, $NaBH_4$, Diisobutylaluminiumhydride(DIBAL), Sodium cyanoborohydride, trialkyl borohydrides, Reduction with diimide,. Wolff-Kishnerreduction.	12
III	**Molecular Rearrangements** Migration to electron deficient carbon atom**.** Pinacole-Pinacolone rearrangement, Wagner-Meerwein rearrangement, Dienone-Phenol rearrangement, Benzil-Benzilic acid rearrangement, Favorski rearrangement, ARNDT Eistert rearrangement,Sommelet – Hauser rearrangement. Migration to electron deficient hetero atom:.Wolf, Hofmann, Curtius, Lossen, Schmidt, Beckmann rearrangement, Baeyer-Villiger rearrangement, Stevens, Neber rearrangements. Fries, Fischer- Hepp,Orton,Bamberger,Dakin,CumeneHydroperoxide rearrangement.	12
IV	**Pericyclic Reactions – I:** Definition, classification of pericyclic reactions, Molecular Orbital energy level diagrams, electronic configuration in ground and first excited states of Ethylene, 1,3-Butadiene, 1,3,5 – Hexatriene, allyl system, stereo chemical notations – suprafacial, antarafacial, conrotatory and disrotatory modes, Woodward and Hoffmann selection rules. **Electrocyclic reactions**: Mechanism, Stereochemistry of $(4n)$ and $(4n+2)$ π systems. PMO, FMO and correlation methods. **Cyclo additions**: Mechanism, stereochemistry of $(2+2)$ and $(4+2)$ π systems, PMO, FMO and correlation methods. **Sigmatropic rearrangements**: Classification, mechanism for FMO and PMO approach under thermal and photo chemical conditions. (Detailed treatment of Claisen, Cope rearrangements fluxional molecules, aza-cope rearrangements).	12
V	**Photochemistry:** Photochemical processes: Energy transfer, sensitization and quenching. Singlet and triplet states and their reactivity. Photochemistry of olefins – conjugated olefins, Aromatic compounds–isomerisation–additions. Photochemistry of carbonyl compounds – Norrish type I and II reactions –Paterno – Buchi Reaction. Photoreduction, Photochemical rearrangements–Photo Fries rearrangement, Di-π-methane rearrangement, Barton reaction.	12

Title of the Paper: ORGANIC SYNTHESIS

Course Code: 20CH3T3A

Semester:III

Syllabus

Unit	Learning Units	Lecture Hours
I	**Formation of carbon-carbon single bonds:** Alkylation of relatively acidic methylene groups, alkylation of ketones, enamine and related reactions, umplong (dipole inversion). Allylic alkylation of alkenes, alkylation of α-thiocarbanions- α- seleno carbanions, formation of carbon carbon single bonds by the addition of free radicals to alkenes, synthetic applications of carbenes and carbenoids.	12
II	**Formation of carbon-carbon double bonds** Pyrolytic syn elimination reactions sulphoxide-sulphonate rearrangement, synthesis of allyl alcohols, the witting reaction, alkenes from sulphones, decarboxylation of β-lactones, alkenes from aryl sulphonyl hydrazones. Stereo selective synthesis of tri and tetra substituted alkenes, oxidative decarboxylation of carboxylic acids, stereospecific synthesis from 1,2-diols, reductive dimerization of carbonyl compounds.	12
III	**Diels–Aider and related reactions**: The dienophile, heterodienophile, oxygen as dienophile, The diene, acyclic dienes, heterodienes, 1,2-dimethylene cycloalkanes, vinyl cycloalkenes, and vinyl arenes, cyclic dienes and furans. Intra molecular Diels –Alder reactions, stereochemistry and mechanism of Diels – Alder reaction, retro Diels – Alder reaction, catalysis by lewis acids, photosensitized Diels- Alder reactions and 1,3-dipolar cycloaddition reactions, the ene reaction.	12
IV	**Disconnection approach** Introduction to Retro-synthetic analysis, Disconnection approach with suitable examples, Definitions: FGI, Disconnection, synthons, synthetic equivalent, reagent, target molecule, General strategy: choosing a disconnection, greatest simplification, symmetry, high yielding steps, recognizable startingmaterials. Chemo, regio and stereo selectivity with examples. One group C-C disconnections-Alcohols, carbonyl compounds, alkene synthesis, two group disconnections: 1,3 – dicarbonyl compounds, α,β – unsaturated carbonyl compounds.	12
V	**Protecting groups:** Theory and importance of functional group protection and deprotection in organic synthesis:-Protecting agents for the protection of functional groups: Hydroxyl group, Amino group, Carbonyl group and Carboxylic acid group carbon-carbon multiple bonds; chemo- and regioselective protection and deprotection. Illustration of protection and deprotection in organic synthesis.	12

Title of the Paper: CHEMISTRY OF NATURAL PRODUCTS

Semester:III
 Course Code: **20CH3T4B**

Syllabus

Unit	Learning Units	Lecture Hours
I	Alkaloids: Introduction, Definition, occurrence, role of alkaloids in plants, classification, isolation and general methods for structural elucidation of alkaloids. Structure elucidation of Morphine, Quinine.	12
II	Terpenoids:Introduction,Definition,nomenclature,classification, isolation, isoprene rule and general methods for structural elucidation of Terpenoids. Structure elucidationof Zingiberene, , farnesol.	12
III	Steroids: Introduction, Definition, nomenclature, classification. Occurrence, isolation, physiological action, structure elucidation of Androsterone, Progesterone.	12
IV	Flavonoids and Isoflavonoids: Introduction, Definition, classification, isolation, physiological action, structure elucidation of Kaempferol and Quercetin.	12
V	Pigments: Introduction, classification of natural pigments, introduction and classification of carotenoids, functions of carotenoids in plants and animals, structure and synthesis of α – carotene and β – carotene	12

Title of the Paper: POLYMER CHEMISTRY

Semester:III
Course Code: **20OECH**

Syllabus

Unit	Learning Units	Lecture Hours
I	Introduction, Classification of polymers, Polymerization, chain polymerization, step polymerization, Co polymerization, Free radical chain polymerization, cationic polymerization, anionic polymerization, Polymerization Techniques, Graft and Block Copolymers.	12
II	Polymer Synthesis,Isolation and Purification of polymers, Polymer Fractionation, Molecular weight determination,Molecular weight determination curve, Processing Techniques.	12
III	Polymer Reactions–Introduction, Hydrolysis, Acidolysis, Aminolysis, Hydrogenation, Addition and Substitution Reactions, Cyclisation reactions, Cross-linking Reactions.	12
IV	Polymer Degradation – Definition, Types of Degradation, Thermal Degradation, Mechanical Degradation, Degradation by Ultrasonic Waves, Photodegradation, Degradation by High-Energy Radiation, Oxidative Degradation, Hydrolytic Degradation.	12
V	Plastics, Fibres, Elastomers-Polyethylene, Polystyrene, PolyEsters, PolyAcrylonitrile, Polyurethanes, Polyvinyl Chloride, Polyisoprenes. Resins–Phenol Formaldehyde Resin, Urea Formaldehyde and Melamine–Formaldehyde Resins,Epoxy Polymers, Silicon Polymers.	12

Title of the Paper: ORGANIC PREPARATIONS   Semester: III

Course Code: 20CH3L1

Syllabus

 Course Details:-

1. Preparation of organic compounds: Three stage preparations by reactions involving nitration, halogenation, oxidation, reduction, alkylation, acylation, condensation and rearrangement. (A student is expected to prepare at least five different organic compounds by making use of the reactions given above).

2. Green Procedures for organic compound preparations (atleast 5preparations).

Title of the Paper: Mixture Analysis

Semester:III
Course Code: 20CH3L2

Syllabus

Analysis of organic binary mixtures: Separation and identification of organic binary mixtures (The students must be given training in at least 10 mixtures with different functional groups).

Note: For semester end examinations the student has to submit at least two solid derivatives for each individual component.

Course Focus: Skill Development & Employability

A.G.& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
II SEMESTER
Paper Code & Title: 22CH2T1: ADVANCED INORGANIC CHEMISTRY

Unit-I: Non-metal cages and metal clusters:
Structure and bonding in phosphorous-oxygen, phosphorous-Sulphur cages; structure and bonding in higher boranes with (special reference to B12 icosahedra). Carboranes, metalloboranes, metallocarboranes. Classification- LNCs and HNCs, Isoelectronic and Isolobal relationships, electron counting rules: Wade's and Lauher's rules. M-M multiple bonding; preparation, structure and bonding in dinuclear [Re2Cl8] 2- ion, trinuclear [Re3Cl9], tetra nuclear W4(OR)16, hexa nuclear [Mo6Cl8]4+ and [Nb6Cl12]2-.

Unit-II: Organometallic chemistry of transition metals:
Classification and electron counting rules, hapticity, synthesis, structure and bonding of Olefinic complexes, Acetylene complexes, ferrocene, dibenzene chromium, cyclo heptatriene and tropylium complexes of transition metals. Reactions of organometallic compounds - oxidative addition reductive elimination, insertion and elimination. Applications of organometallic compounds, Catalytic hydrogenation,
Hydroformylation, alkene polymerization.

Unit-III: Reaction mechanism of transition metal complexes:
Kinetics of octahedral substitution, acid hydrolysis, base hydrolysis-conjugate base (CB) mechanism. Direct and indirect evidences in favour of CB mechanism. Anation reactions. Reactions without metal-ligand bond cleavage. Factors affecting the substitution reactions in octahedral complexes. Trans effect on substitution reactions in square planar complexes. Mechanism of redox reactions, outer sphere mechanism, cross reactions and Marcus –Hush equation, inner sphere mechanism.

Unit-IV: Term symbols and Electronic spectra: Term symbols:
Term symbols and their derivation, Microstates, Hunds rules to predict ground terms and ground states. List of ground energy and higher energy terms from d1 to d9 configurations;
Electronic spectra of transition metal complexes:
Spectroscopic terms. Selection rules, Slator–Condon parameters, Racah parameters, Term separation energies for dn configurations, Orgel diagrams. Tanabe-Sugano diagrams for d1 to d9 configurations. Calculations of Dq, B and β parameters. Charge transfer spectra.

Unit-V: Bio-inorganic chemistry and Magnetic properties of complexes:
Storage and transport of dioxygen by Hemoglobin and Myoglobin, Vitamin B12 and its importance.
Magnetic properties of transition metal complexes:
Types of magnetism, factors affecting Para magnetism, anomalous magnetic moments - Orbital and spin contribution, spin-orbit coupling and magnetic moments chiro optical properties, cotton effect and Faraday effect.

A.G.& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
II SEMESTER
Paper Code & Title: 22CH2T2: ADVANCED ORGANIC CHEMISTRY

Unit-I: Named reactions:
Aldol condensation, Benzoin condensation, Cannizzaro condensation, claisen condensation, Dieckmann condensation, Perkin condensation, Stobbe condensation, Reformatsky reaction, Mannich reaction, Reimer-Tiemann reaction, Vilsmeier-Haack reaction, Shapiro reaction, McMurray reaction, Michael addition reaction, Wittig reaction, Stork – Enamine reaction, Acyloin condensation, Robinson ring annulation and Simmon-Smith reaction.

Unit-II: Stereo Chemistry-I:
Concept of chirality, Recognition of Symmetry elements. Definition and classification of Stereoisomers, Enantiomer, Diastereomer, Homomer, Epimer, Anomer, Configuration and Conformation, Configurational nomenclature: D,L and R, S nomenclature. Molecular representation of organic molecules: Fischer, Newman and Sawhorse projections and their inter-conversions. Geometrical Isomerism. Cis-trans, E, Z- and Syn and anti nomenclature, Methods of determining configuration of Geometrical isomers using physical, spectral and chemical methods.

Unit-III: Stereo Chemistry-II:
Definition of Conformation, Conformational analysis of acyclic molecules – alkanes and substituted alkanes. Conformational analysis of monocyclic molecules – cyclohexane – chair, boat and twist boat - mono and disubstituted cyclohexanes and conformation around carbon hetero atom bonds having C–O & C–N. Confirmation and intramolecular hydrogen bonding.

Unit-IV: Green chemistry:
Introduction to Green chemistry, Principles and concepts of Green chemistry, Green Catalysis, Biocatalysis, renewable resources, Green Reagents, examples of green reactions-synthesis of Ibuprofen, Clean Fischer-Indole synthesis comparison of the above with conventional methods. Introduction to Microwave organic synthesis: introduction, advantages and disadvantages. Applications: solvents (water and organic solvents), solvent free reactions (Solid state reactions).

Unit-V: Chemistry of Nanomaterials:
Introduction, carbon nanotubes: structure of single and multi-walled carbon nanotubes, synthesis-solid and gaseous carbon source-based production techniques, synthesis with controlled orientation. Growth mechanism of carbon nano tubes-catalyst free growth, catalyst activated growth, general properties and applications.

M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
II SEMESTER
Paper Code & Title: 22CH2T3: ADVANCED PHYSICAL CHEMISTRY
Unit-I: Third law of Thermodynamics and Statistical thermodynamics:
Nernst Heat theorem - Third law of thermodynamics - Its limitations - Determination of absolute entropy -
Thermodynamic probability and most probable distribution, Entropy and probability - Boltzmann-Plank equation. Ensembles, Maxwell-Boltzmann distribution, Fermi-Dirac statistics, Bose Einstein statistics. Partition function - calculation of thermodynamic properties in terms of partition function - Chemical equilibrium and partition function - Translational, rotational and electronic partition function - Entropy of Monoatomic gases (Sackur-Tetrode equation).

Unit-II: Polymer chemistry and Raman Spectroscopy:
Classification of polymers - Free radical, ionic and Zeigler -Natta Polymerization - kinetics of free radical polymerization -Techniques of polymerization -Glass transition temperature - Factors influencing the glass transition temperature. Number average and Weight average, Molecular weights –molecular weights determinations – Membrane Osmometry, Light scattering phenomenon. Classical and quantum theories of Raman effects, pure rotational, vibrational and Vibrational- rotational Raman spectra, selection rules, mutual exclusion principle

Unit-III: Electro Chemistry-II:
Reference electrode - Standard hydrogen electrode. Calomel electrode -Indicator electrodes: Metal-metal ion electrodes - Inert electrodes -Membrane electrodes - theory of glass membrane potential, potentiometric titrations, advantages of potentiometric titrations, Conductometric titrations. Electrode potentials - Double layer at the interface - rate of charge transfer - Decomposition potential - Over potential - Tafel plots - Derivation of Butler-Volmer equation for one electron transfer - electro chemical potential.

Unit-IV: Chemical kinetics and Photo chemistry:
Branching Chain Reactions – Hydrogen oxygen reaction - lower and upper explosion limits - Fast reactions - Study of kinetics by flow methods - Relaxation methods - Flash photolysis. Acid base catalysis –protolytic and prototropic mechanism. Enzyme catalysis - Michelis-Menten kinetics.

Photochemistry:
Quantum yield and its determination, Actinometry, Reactions with low and high quantum yields, Photo sensitization, Exciplexes and Excimers, Photochemical equilibrium, Kinetics of collisional quenching - Stern- Volmer equation.

Unit-V:
Radioactivity and Isotopes: Introduction to radioactivity, properties of alpha rays, beta rays and gamma rays, theory of radioactive disintegration, rate of disintegration, Geiger – Nuttal rule, radioactive equilibrium. Isotopes - radioactive and non-radioactive isotopes, group displacement law. Analysis of isotopes – Aston's mass spectrograph, Dempster's method, Bainbridge's method. Separation methods of isotopes. Applications of Radio isotopes in Industry and medicine.

Course Learning Outcome(S):
After studying this paper, students will acquire the knowledge of Third law of Thermodynamics and Statistical thermodynamics, Polymer chemistry and Raman Spectroscopy, Electro Chemistry, Chemical kinetics and Photo chemistry, Radio activity and isotopes.

A.G.& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
II SEMESTER
Paper Code & Title: 22PG201:
RESEARCHMETHODOLOGY&INTELLECTUAL PROPERTY RIGHTS (IPR)

UNITI
Foundations of   Research

MeaningofResearch–DefinitionsofResearch–MotivationinResearch–GeneralCharacteristicsofResearch–CriteriaofGoodResearch–TypesofResearch–ResearchProcess–ResearchMethodsvs.Methodology–DefiningandFormulatingtheResearchProblem – Review of Literature – Approaches to Critical Literature Review – Importance ofLiterature Review in Identifying Research Gaps and Defining a Problem – Development ofWorkingHypothesis.

UNITII
Research Design, Sampling Concepts, and Data Collection Methods

Meaning, Significance and Characteristics of Good Research Design– : Exploratory, Conclusive Research and Experimental – Sampling Theory :Types of Sampling and Errors in Sampling – Data Collection: Types of Data – Data Collection Methods and Techniques for Primary and Secondary Data.

UNITIII
Measurement & Scaling Techniques, Hypothesis Formulation and Testing, Overview of Data Analysis and Report Writing

Basic measurement scales – Reliability & Validity – Definition and Types of Hypothesis –Hypothesis Formulation and Testing Procedure – Overview of Data Analysis: Methods, Process and Types – Report Writing: Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Mechanics of Writing a Research Report, Precautions for Writing Research Reports– How to Write a Research Proposal, Research Ethics, Conflict of Interest and Plagiarism.

UNITIV
Intellectual Property Rights (IPR)

Definition and Nature and Features of Intellectual Property Rights(IPR)–Types of Intellectual Property Rights – Procedure for Grants of Patents–Rights of a Patent –Scope of a Patent Rights
– LicensingandTransferofTechnology–Whyprotectionofintellectualpropertyisimportant?
– Enforcement of IPR–Infringement of IPR.

UNITV
Indian and International Scenario and New Developments in IPR

IPR Developments in India for the past Five Years – Development of IPR Laws in India – International Cooperation on IPR– New Developments in IPR– Administration of Patent System–International Patent protection– Case Studies in Indian and Global Contexts.

A.G.& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)
II SEMESTER Paper Code & Title: 22CH2E1: MOLECULAR SPECTROSCOPY
UNIT- I

Introduction to Molecular Spectroscopy: Motion of molecules-Degrees of freedom – Energy associated with the degrees of freedom-Type of spectra.

Microwave spectroscopy: Classification of molecules, rigid rotator model, effect of isotopic substitution on the transition frequencies, Intensities non-rigid rotator-Microwave spectra of polyatomic molecules.

UNIT – II

Infrared spectroscopy:

Harmonic oscillator, vibrational energies of diatomic molecules, zero point energy, force constant and bond strengths, anhormonicity Morse potential energy diagram. Vibration – rotation spectroscopy. PQR braches, Born – oppenheimer approximation, Break down Born – openheimer approximation, normal modes of vibration group frequencies, overtones, hot bands, application of IR spectra to polyatomic molecules.

UNIT – III

Unit-II: Raman Spectroscopy:

Classical and quantum theories of Raman effects, pure rotational, vibrational and Vibrational-rotational Raman spectra, selection rules, mutual exclusion principle, Resonance Raman spectroscopy, coherent antistrokes Raman Spectroscopy (CARS).

UNIT – IV

UV- Visible Spectroscopy:

Electronic Spectra of diatomic molecules, vibrational structure of an electronic transition, classification of bands, rotational fine structure of electronic vibrational transition. Electronic Spectra of Polyatomic Molecules.

UNIT – V

Electron Spin Resonance Spectroscopy:

Basic Principles, zero field splitting and kranners's degeneracy, factors affecting the 'g' value. Istropic and anisotropic hyperfine coupling constants, spin hamiltenia, spin densities measurement techniques - simple applications like methyl radical, ethyl radical etc.,

Paper Code & Title: 22CH2E2: INSTRUMENTALMETHODSOFANALYSIS

UNIT-I: Spectro-analytical methods of analysis :Flamephotometry:
Theory,instrumentation, combustion flames, detectors and analysis of Na, K, Ca, Mg.
Atomic AbsorptionSpectrometer: theory, instrumentation, flame and non-flame techniques, resonancelinesources,hollow cathode lamp,chemicalandspectral interferences, applications with specialreference to analysis of trace metalsin oils,alloysandtoxic metals in drinking waterandeffluents.
Inductively coupled plasma spectrometer (ICP-AES,   ICP-MS):
Principles,instrumentation,plasma
,AESdetectors,quadrupolemassspectrometers,differencebetweenthetwodetectors,applications.

UNIT-II: Thermal methods of Analysis:Thermometry
:Theory,instrumentation,applicationswith specialreference to $CuSO_4.5H_2O$, $CaC_2O_4.2H_2O$, $CaCO_3$, $(COOH)_2.2H_2O$
Differential thermal analysis: Principle, instrumentation, difference betweenTGandDTA-applicationswithspecialreferencetotheclaysandminerals,coals(fuels).
Differential scanningcalorimetry : Principle, instrumentation, applications to inorganic materials like chlorates and per chlorates, ammonium nitrate, organic compoundsand drugs.

UNIT-III: Electro analytical Methods-1:   Polarographic   analysis:
Principle and Instrumentation, Dropping   mercury   electrode (DME),advantages and disadvantages of DME, qualitative and quantitative analysis of inorganic ions-Cu, Bi,Pb,Cd,Zn,ACpolarography,pulsepolarography.
Anodestrippingvoltametry:Principle,instrumentation,Hanginmercury dropelectrode,applicationintheanalysisofPbandCdinenvironmentalsamples,principle ofcathode strippingvoltametry.

UNIT-IV: Electro analytical methods -2 Principle,importanttermsin
 electrogravimetry, decomposition voltage or decomposition potential, over voltageandtheirimportance,instrumentation,electrolysisatconstantcurrent,determinationof $Cu^{2+}$by constant current electrolysis, electrolysis at controlled potentials, determination of Cu, Pb,Sn in brass   and bronze by controlled potential electrolysis.
Coulometricanalysis: Principlesof coulometric analysis with constant current and controlled potential, coulometric analysiswithcontrolledpotential,applicationsofcoulometricmethodsforthe analysis of cations-As(III), Fe(II) and I⁻and $S^{2-}$by using I_2 liberations and Ce^{4+} liberation in solutions.

UNIT-V: Electro analytical methods-3 Amperometry:Introduction, principle, conditionsfor performing amperometric titrations, advantages, titrations with rotating platinum electrode,applications.
Biamperometry: Principle,biamperometrictitration sandits curves,applications.
Cyclicvoltametry: Basic principles,applications.

A.G.& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

II SEMESTER
Paper Code & Title: ANALYSIS OF DRUGS, FOODS, DAIRY PRODUCTS & BIOCHEMICALANALYSIS

UNITI
Analysis of the following drugs and pharmaceuticals preparations :(Knowledge of molecular formula, structure and analysis) Analysis of analgesics and antipyretics like aspirin and paracetamol Analysis of antimalerials like choloroquine.Analysisof drugs in the treatment of infections and infestations: Amoxycillin., chloramphenicol, metronidazole, penicillin, tetracycline. Antituberculousdrug-isoniazid.

UNITII
Analysisofthefollowingdrugsandpharmaceuticalspreparations:(Knowledgeofmolecularformula,structureandanalysis)Analysisofantihistaminedrugsandsedativeslike:allegra,zyrtec(citirizine),alprazolam,trazodone,lorazepem.

UNITIII
Analysis of anti epileptic and anti convulsant drugs like phenobarbital and phenacemide. Analysis ofdrugsusedincaseofcardiovasculardrugs:atenolol,norvasc(amlodipine),AnalysisofLipitor(atorvastatin)adrugforthepreventinofproductinofcholesterol.
Analysis of diuretics like: furosemide (Lasix), triamterene Analysis of prevacid (lansoprazole) a drugusedforthepreventionofproductionofacidsinstomach.

UNITIV
Analysis of Milk and Milk Products: Acidity, total solids, fat, total nitrogen, protenines, lactose,phosphate activity,casein,chlorideAnalysis offoodmaterials.
Preservatives: Sodium carbonate, sodium benzoate sorbic acid Flavoring agents - Vanilla, diacetyl,isoamyl acetate, limonene, ethylpropionate, allyl hexanoate and Adulterants in rice and wheat, wheatflour,sago,coconutoil,coffeepowder,teapowder,milk.

UNITV
ClinicalAnalysisofBlood: Compositionofblood,clinicalanalysis,traceelementsinthebody.Estimationofblood cholesterol,glucose,enzymes,RBC &WBC,Bloodgasanalyser.

A.G.& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

II SEMESTER
Paper Code & Title: ORGANIC CHEMISTRY PRACTICAL-II
Course Code: 22CH2L1

Practical – I – Organic Chemistry (22CH2L1)

List of experiments:
1. Preparation of organic compounds: Single stage preparations by reactions involving nitration,
   halogenation, oxidation, reduction, alkylation, acylation, condensation and rearrangement.
   (A student is   expected to prepare at least 5 different organic compounds by making use of the
   reactions given above).
2. Preparation of organic compounds: Two stage preparations by reactions involving nitration,
   halogenation, oxidation, reduction, alkylation, acylation, condensation and rearrangement.
   (A student is expected to prepare at least 5 different organic compounds by making use of
   the reactions given above).
3. Systematic qualitative analysis of organic compounds with different functional groups (5
   different compounds)

Course Learning Outcome(S): After studying this paper, students will acquire the knowledge of
Organic chemistry practical.

Text books/ Reference books:
1. A.I.Vogel, "A Text Book of Practical Organic Chemistry", Longman
2. A.I.Vogel, "Elementary Practical Organic Chemistry", Longman
3. Practical Organic Chemistry, F.G.Mann and B.C.Saunders, Longman.
4. Reaction and Synthesis in Organic Laboratory, B.S.Furniss, A.J.Hannaford, Tatchell,
University Science Books Mills valley.
5. Purification of Laboratory chemicals, manual, W.L.F. Armarego EDD Perrin.
6. Reaction and Synthesis in Organic Chemistry Laboratory, Lutz-Friedjan-Tietze,
TheophilEicher, University Science Book.

A.G.& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

II SEMESTER
Paper Code & Title:: PHYSICAL CHEMISTRY PRACTIAL
Course Code: 22CH2L2

List of experiments:
1. Relative strengths of acids by studying the hydrolysis of ethyl acetate / methyl acetate.
2. Determination of equilibrium constant of KI3 KI + I2 by partition coefficient.
3. Determination of unknown concentration of potassium iodide by partition coefficient method.
4. Distribution coefficient of Benzoic acid between Benzene and water.
5. Determination of critical solution temperature of phenol-water system.
6. Study of the effect of electrolyte on the miscibility of phenol-water system.
7. Determination of Coordination number of cuprammoniumcation.
8. Potentiometric determination of Fe(II) with Cr (VI).
9. Potentiometric determination of Fe(II) with Ce (IV).
10. pH-metric determination of strong acid with strong base.
11. Conductometric titration of strong acid with strong base.
12. Conductometric titration of strong acid + Weak acid with strong base.
13. Dissociation constant of weak acid (CH3COOH) by conductometric method.
14. Determination of cell constant.
15. Verification of Beers Law using potassium permanganate/Potassium dichromate.

Course Learning Outcome(S): After studying this paper, students will acquire the knowledge of
Inorganic and Physical chemistry experiments.

Text books/ Reference books:
1. Experimental Physical chemistry by V.D. Athawale, Paul Mathur, New Age International publishers.
2. Physical chemistry experiments by V. P. Kudesia, Pragati Prakasan publishers.
3. Advanced practical Physical chemistry by J.B. Yadav, Krishna's educational publishers.

A.G.& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

IV SEMESTER
MOOCS – ANALYTICAL CHEMISTRY
Course Code: 22CH4T1

UNIT – 1
Basic introduction to nature of analytical chemistry Quantitative methods Qualitative methods , Flow diagrams ,Chemistry in toxicology ,Examples for quantitative and qualitative methods, real life examples ROLE : sample preparation basic techniques for analysis physical separation , separation in liquids ,micro analytical balance ,filtration techniques ,wet washing ,dry Ashing , crucibles, filter paper uses of crucibles and filter papers stereo chemical modes are applied [supra +supra] : supra-anta Antra, supra Antra- anta.

UNIT - 2
Chemical equilibria, Chemical equilibria in nature chemical equilibria in analytical chemistry, equilibria between strong and week acids , equilibrium state, different acids, types of equilibria as basis of chemical analysis, equilibria and equilibria constants , importance in analytical chemistry, salt hydrolysis, titration curves , common ion effect , formation constant for complex ions, Introduction from different titrimetric methods, hendersonhesselbalch equation, spectro chemical methods , acid base titrations, acid base titration indicators.

UNIT- 3
Absorption Spectrometry , instruments , beers law, different transitions , chromophores , d-d , f-f, C-T transitions and applications, chromophoric reagents , analysis of mixture , applying beers law to mixtures , applications – photometric titrations, spectro photometric titrations, A) complexing agent B) complex ion in solution , infrared absorption spectroscopy A)theory B) principle C) instrumentation for IR, FTIR techniques A) theory B) principle, instrumentation of FTIR , uses and interterometer.

UNIT – 4
Thermal method of analysis Introduction ,dynamic measurement, thermo gravimetric analysis, differential thermal analysis , differential scanning calorimerty, thermo balance, thermal techniques and uses , thermal analysis – solids , Standardisation, geometric estimation, water content, TG-plot , thermo gravimetry – example, mixture of solids in TG, introduction of DTG, samples , furnaces and crucibles, DT, uses of DTG data, food analysis, introduction to DTG, DTA , instruments, uses and applications, DSC, instruments uses and applications, Introduction, electron transfer reactions, electrodes, electrode potential, standard electrode potential, nernest equation, applications of nernest equation, precipitaion /complex ions in nernest equation, electro chemical method of analysis, potentiometry, reference electrode

UNIT 5
Potentiometers, cells, potentiometric titrations, Use of oxidising and reducing agents , redox potential, potentiometric titrations, uses of oxidising and reducing agents, electrode potentials, IR drop In electrochemical cells, ohmic potential electro gravimetric method , controlled potential coulrometry, Its uses in synthesis , colorimetric titrations Applications, electrochemical methods, volumetric methods, analytical method , voltametry, cyclic voltametry – waveforms , CV plot, CV and its application to identity, potential pulses, Differential pulses.

22CH4T2A:HETE RO CYCLIC CHEMISTRY

Course Learning Objective(S): The main objective of this paper is to give a basic and updated knowledge for the students on Heterocyclic Chemistry.

UNIT-I
Definition, Classification and Nomenclature (Hantzsch Widman System) of hetero cycles.
Three membered Heterocyclic Compounds: Synthesis, reactivity, and importance of the following ring systems: Aziridines, Oxiranes, Thiiranes, azirine.

UNIT-II
Four membered Heterocyclic Compounds: Synthesis, reactivity, and importance of the following ring systems :Azitidines, oxetanes, Thietanes.
Fused systems: Synthesis and reactivity of Penicillins G and V.

UNIT-III
Five membered Heterocyclic Compounds with two hetero atoms: Synthesis, reactivity, aromatic character, and importance of the following heterocycles: Pyrazole, Imidazole, Oxazole, Isoxazole, Thiazole.
 Fused systems: Synthesis and reactivity of Indoles and Benzimidazoles.

UNIT-IV
Six-membered Heterocyclic Compounds with two hetero atoms: Synthesis, reactivity, aromatic character and importance of the following heterocycles: Pyridazines, Pyrazine, Oxazine, Thiazine.
Fused systems: Acridines and Benzodiazines.

UNIT- V
Larger ring and other Heterocycles: Synthesis and reactivity of Azepines, Oxepines and Thiepines. Synthesis and reactivity of Benzodiazepines.

Course Learning Outcome(S): After studying this paper, students will acquire the knowledge of Heterocyclic Chemistry.
Reference books:

1. Some Modem Methods of Organic Synthesis W.Caruthers, Cambridge University Press, Cambridge.
2. Organic Synthesis viz Boranes, HerbetC. BrownGray, W.KramerAlanB.Levy and M.MarkMidland JohnWilly&Sons, NewYork.
3. Heterochemistry, T.L.Gilchrist, Longman science and tech.
4. Anintroduction to the Chemistry of Heterocyclic Compounds, R.M.Acheson, Interscience Publishers, NewYork
5. Principle of Organic Chemistry, RocNorman, J.M.Coxon, Nelson Throms
6. Advanced Organic Chemistry, F.ACarey and R.J.Sundberg. Plenum.
7. Heterocyclic chemistry by Jai JackLie, Springer publications.

GREEN CHEMISTRY

Course: GREEN CHEMISTRY		
S.No	COURSE OUTCOMES	PO`S
	The student will be able to	
1	Memorize the principles of green chemistry and concepts related to green organic synthesis.	2,7
2	Understand the role and significance of green organic synthesis.	1,5,7
3	Exercise the basic and advanced knowledge gained in green organic synthesis in chosen job role.	1,4,6
4	Analyse how far green methods are environmentally benign over conventional methods of synthesis.	1,3

Unit-I
Principles of Green Chemistry: Prevention of waste / by-products, atom economy, Hazardous products-Designing of safer chemicals-energy requirements Selection of appropriate solvents and starting materials-Use of protecting groups and catalysis-Designing of biodegradable products. green organic synthesis of paracetamol, catechol, adipic acid, urethane and ibuprofen.

Unit-II
Microwave assisted reactions: Theory ofMicrowave, advantages, disadvantages, applications- water as solvent: Hoffmann elimination, hydrolysis, oxidation of Toluene, oxidation of alcohols, hydrolysis of methyl benzoate to benzoic acid.
Organic solvents: Esterification reactions, Fries rearrangement, Ortho ester Claisen rearrangement, DielsAlder reactions, synthesis of chalcones, decarboxylation.
Solid state reactions (solvent free): De acetylation, deprotection, saponification of esters, synthesis of anhydrides from dicarboxylic acid, synthesis of nitriles from aldehydes.

Unit-III
Phase Transfer Catalysis: Definition, Mechanism, Types, advantages and applications of PTC – C-alkylation, N-alkylation, Darzen's reaction, Wittig reaction, Benzoyl cyanides from benzoyl chloride, alcohols from alkyl halides, Crown ethers – Introduction,synthetic applications: esterfication, saponification, Anhydride formation, $KMnO_4$ oxidation, aromatic substitution, elimination.

Unit-IV
Ultrasound assisted green synthesis: Introduction, instrumentation, types of sono chemical reactions – Homogeneous reactions – Curtius rearrangement of Benzoyl azide to phenyl isocyanate. Heterogeneous Liquid-Liquid reactions - Esterification, saponification, Hydrolysis, substitutions, additions. Heterogeneous Solid – Liquid Reactions–oxidation, reduction, hydroboration, coupling, Bouveault reaction, Strecker reaction.

Unit-V
Ionic liquids: Definition-Types of Ionic Liquids- properties- Application in organic synthesis- alkylation, allylation, oxidation, hydrogenation, hydroformylation, alkoxycarbonylation, carbon-carbon bond forming reactions-suzuki coupling, Heck reaction, stille coupling.

22CH4T3 A: TECHNIQUES FOR MODERN INDUSTRIAL APPLICATIONS

COURSE :TECHNIQUES FOR MODERN INDUSTRIAL APPLICATIONS		
S.No	COURSE OUTCOMES:	PO`S
	The student will be able to	
1	Comprehend the concepts of purification methods and chromatographic methods.	2,7
2	Exercise the knowledge gained in purification and chromatographic techniques in their chosen job role.	1,4,6
3	Assess that how far the purification and chromatographic techniques are useful in assessing the purity of the compound.	1,3,7
4	Evaluate that how far a compound is purified / separated using purification and chromatographic techniques.	1,5,7

UNIT-I

Classical Methods of purification Recrystallization: Basic principle, choice of solvent, seeding, filtration, centrifugation and drying. Concepts of fractional crystallization.
Distillation: Basic principle. Distillation types- continuous distillation, batch distillation, fractional distillation, vacuum distillation and steam distillation.

UNIT-II

Thin Layer chromatography:
Basic Principle, Common stationary phases, Methods of preparing TLC plates, Selection of mobile phase, Development of TLC plates, Rf value. Application of TLC in monitoring organic reactions. identification and quantitative analysis.

UNIT-III

Paper chromatography:
Basic Principle, Ascending and descending types. Selection of mobile phase,
Development of chromatograms, One and two dimensional paper chromatography, Applications of paper chromatography.

UNIT-IV

Gas chromatography:
Basic Principle, Different types of GC techniques. Selection of columns and carrier gases. Instrumentation. detectors; Rf values. Applications in the separation, identification and quantitative analysis of organic compounds.

UNIT-V

High Performance liquid chromatography(HPLC):
Basic Principle, Normal and reversed Phases. Selection of column and mobile phase. Instrumentation. Detectors; Rf values. Applications in the separation, identification and quantitative estimation of organic compounds.

22CH4T3 B: NANO CHEMISTRY

Course Learning Objective(S): The main objective of this paper is to give a basic and updated knowledge for the students on Nano Chemistry.

Unit-I
Introduction to Nano chemistry: Definition of terms-nanoscale, nanomaterials, nanoscience,
nanotechnology-scale of materials natural and manmade-nanoscience practiced during ancient
and modern periods-contributors to the field of Nanochemistry.

Unit-II
Synthesis of Nanomaterials: Top down and bottom- up approaches-synthesis of carbon
nanotubes, quantumdots, gold and silver nanoparticles.

Unit-III
Characterization of Nano materials: Electron microscopy techniques-scanning electron
microscopy, transmission electron microscopy and atomic force microscopy.

Unit-IV
Application of Nanomaterials: Solar cells-smart materials-molecular electronics-biosensors-
drug delivery and therapy-detection of cancerous cells.

Unit-V
NanochemistryinNature: The science behind the nanotechnology in lotuseffect-self-cleaning property of lotus-gecko foot climbing ability of geckos-water strider-anti wetting property of water striders-spider silk mechanical properties of the spidersilk.

22CH4T4: ORGANO METALLIC REAGENTS

Course Learning Objective(S): The main objective of this paper is to give a basic and updated knowledge for the students on Organometallic Reagents.

UNIT-I

Organo Magnesium and Lithium compounds: Preparation of Grignard reagents with alkyl, allyl, and propargyl halides, alkylation reaction with carbonyl compounds, esters, imines and nitriles, epoxides, acids, acid chlorides, carbondioxide, carbondisulfide, sulfurdioxide. Preparation of alkyllithium reagents, Lithium Di isopropyl amide (LDA) and its synthetic applications.

Unit-II

Organo Copper and Nickel compounds: Organo copper reagents - preparation, reactions, organocuprates, lithium organocuprates (Gilmanreagents). Organonickel compounds: π-allylnickel complexes, preparation of 1,5 cyclic dienes, nickelcarbonyl.

Unit-III

Organo Palladium compounds: Preparation of palladium reagents, π-allyl palladium complexes – formations, reactions – prenylation, formation of conjugated dienes, synthesis of macro cyclic nitrogen hetero cyclic. Heck reaction, Stille coupling reaction, Sonogashira coupling reaction, suzuki coupling reaction.

Unit-IV

Organoboranes: Preparation of Organobornaes viz hydroboration with BH_3-THF, dicylohexyl boranes, disiamylborane, thexylborane, 9-BBN and catechol boranes .protonolysis, oxidation, isomerization and cyclization. Free radical reactions of organoboranes, reactions with α-bromoketones, α-bromoesters, carbonylation, the cyanoborate process and the reaction of alkenyl boranes and trialkyltrialkynyl borates.

Unit-V

Organosilanes: Synthetic applications of organo silicon compounds, protection of functional groups, trimethylsilly ethers, sillylenolethers, trimethylsilyliodide, trimethylsilyl triflate, Peterson olefination. Synthetic applications of α-silylcarbanion and β-silylcarbonyl compounds, alkenylsilanes, Allylsilanes, the β-effect - control of rearrangement of carbonium ions by silicon.

22CH4L1: ORGANIC ESTIMATIONS

Expt. 1: Estimation of phenol (bromination method)
Expt. 2: Estimation of aniline (Bromination method)
Expt.3: Estimation of sugars –glucose and sucrose by using Fehlings solution
Expt. 4: Determination of iodine value of oil or fat
Expt. 5: Determination of saponification value of oil or fat
Expt. 6: Estimation of vitamin 'C' in lime juice.
Expt. 7: Estimation of Nitro group
Expt. 8: Estimation of formaldehyde
Expt. 9: Isolation of caffeine from tea/coffee sample.

22CH4L2: PROJECT WORK

S.No.	COURSE OUTCOMES	PO`S
	Project: PROJECT WORK (code 22CH4L2)	
	The student will be able to	
1	Acquire required skills to implement theoretical knowledge gained.	1,3,4,7
2	Assimilate the required knowledge for future research through practical knowledge gained in the project work.	1,2,7
3	Gain the required ability to start up own industry.	1,4,5,6
4	Comprehend the ability to draft and communicate the practical work.	1,2,7

The project will be assigned in the final semester. The project will be performed at the established industry (or) in the department under the supervision of the faculty or research institutes. It may involve experimental and/or theoretical work as well as critical review of the literature. Each of the students has to carry out original research in a topic in accordance with the work chosen under the guidance and supervision of a teacher in the concerned Department of the college.

Dissertation must be submitted at the end of the semester which will be assessed by the external examiners. Dissertation must be prepared with introduction, Review of the literature, Experimental Session, Results and Discussion, Conclusion and References.

The final dissertation should have at least 40 – 60 pages typed in Times New Roman 12 font except Headings and side headings

Adusumilli Gopala krishnaiah & Sugar Cane Growers Siddhartha Degree College of Arts & Science, Vuyyuru, Krishna District, Andhra Pradesh

(An Autonomous College in the Jurisdiction of Krishna University, Machilipatnam)

Accredited by NAAC with "A" Grade ISO 9001:2015 Certified Institution

DEPARTMENT OF COMPUTER SCIENCE

2022-23 (ODD SEMESTER)
HIGHLIGHTED SYLLABUS OF COMPUTER SCIENCE

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability

Skill-Development

Entrepreneurship

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Title of the Paper: WEB INTERFACE DESIGNING TECHNOLOGIES

Semester: V/VI

Course Code	SECCSCT01	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2022-23	Year of Offering: 2022 -23	Year of Revision: ----	Percentage of Revision: 0%

Course Objective: To create web elements like buttons, banners & Bars and of course complete UI designs. Forms and validations for your website. Setting up page layout, color schemes, contract, and typography in the designs. Writing valid and concise code for web pages.

Course Outcomes: Students at the successful completion of the course will be able to:

CO$_1$	Understand web application and static web page using Html. (PO5)
CO2	Gain knowledge about various designing of style sheets. (PO5)
CO3	Demonstrate skills regarding creation of an interface to dynamic website.(PO7)
CO4	Gain knowledge about various advantages of XML and validating schema(PO5)
CO5	Learn how to install word press and gain the knowledge of installing various plugins to use in their websites. (PO5,PO7)

<div align="center">

Syllabus

</div>

Course Details

Unit	Learning Units	Lecture Hours
I	**Web Designing, HTML** **Web Designing:** Introduction To Web Designing, Difference Between Web Applications And Desktop Applications. **HTML:** Introduction To HTML, Introduction To HTML, Headings, Paragraphs Styles &Colors, HTML Formatting, Quotations, Comments, Hyperlinks, Lists, Using colors and images, Tables, Multimedia Objects - Video, Audio, Plugins, You Tube, Frames, Forms	12
II	**CSS, HTML API'S** **CSS**: Introduction, Using Styles, Simple Examples, Defining Your Own Styles, Properties and Values in Styles, Style Sheets, Formatting blocks of information, Layers, CSS Combinators, Pseudo Class, Pseudo Elements, Opacity, ToolTips, Image Gallery, CSS Forms, CSS Counters, CSS Responsive.**HTML API'S:** Geolocation, Drag/drop, local storage, HTML SSE	12
III	**Client side Validation:**Introduction to JavaScript: What Is DHTML?, JavaScript Basics,Variables,StringManipulations,MathematicalFunctions,Statements,Operators,Arrays,Functions.Objects in JavaScript –Data and Objects In JavaScript, Regular Expressions, Exception Handling. DHTML with JavaScript :Data Validation, Opening a New Window, Messages and Confirmations, The Status Bar, Different Frames, Rollover Buttons, Moving Images	14
IV	**XML:** Introduction to xml, How to write a xml document, Elements and attributes, Comments in xml, Namespace in xml, Xml css, Advantages of xml, Uses of xml, xml schema, data types, simple types, complex types ,Validating DTD,XSD.	12
V	**Word press** Introduction to word press, servers like wamp, bitnami e.tc, installing and configuring word press, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts, working with media-Adding, editing, deleting media elements, working with widgets, menus.	10

Text Book/ references / e-books/websites

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley
2. Web technologies by A.A.Puntambekar
3. Web Technologies by N.P.Gopalan,Eastern Economy Edition,2nd edition
4. Paul S.WangSanda S. Katila, an Introduction to Web Design plus Programming, Thomson
5. Head First HTML and CSS, Elisabeth Robson, Eric Freeman, O'Reilly Media Inc.
6. An Introduction to HTML and JavaScript: for Scientists and Engineers, David R. Brooks.
7. Schaum's Easy Outline HTML, David Mercer, Mcgraw Hill Professional.
8. Word press for Beginners, Dr.Andy Williams.
9. Professional word press, Brad Williams, David damstra, Hanstern.
10. Web resources:
    a. http://www.codecademy.com/tracks/web
    b. http://www.w3schools.com
    c. https://www.w3schools.in/wordpress-tutorial/ d.http://www.homeandlearn.co.uk

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COMPUTER SCIENCE	SECCSCP01	2022-23	B.SC(MPCS,MCCS)

SEMESTER – V/VI   **PAPER – VI**   **Max. Marks 50**

Lab List: WEB INTERFACE DESIGNING TECHNOLOGIES LAB

No. of Hours per week: 3   **External: 40**   **Internal: 10**   **Credits: 2**

I. Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Create a basic website with the help of HTML and CSS.(PO5)

CO2: Acquire the skill of installing word press and various plugins of Word press.(PO5)

CO3: Create a static website with the help of Word press..(PO5,PO7)

CO4: Create an interface for a dynamic website.(PO5,PO7)

CO5: Apply various themes for their websites using Word press.(PO7)

II.Practical (Laboratory) Syllabus: (30 periods)

HTML and CSS:

1. Create an HTML document with the following formatting options:
(a)Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font (Type, Size and Color), (f) Background (Colored background/Image in background), (g) Paragraph, (h) Line Break, (i) Horizontal Rule, (j) Pre tag

2. Create an HTML document which consists of:
(a) Ordered List (b) Unordered List (c) Nested List (d) Image

3. Create a form using HTML which has the following types of controls:
(a) Text Box (b) Option/radio buttons (c) Check boxes (d) Reset and Submit buttons
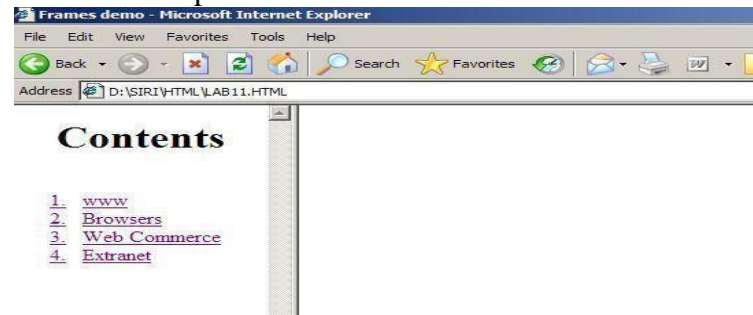
4.Embed a calendar object in your web page.

5. Create an applet that accepts two numbers and perform all the arithmetic operations on them.

6. Create nested table to store your curriculum with image.

7. Create a form that accepts the information from the subscriber of a mailing system.

8. Create a help file as follows:

9. Write a html program including style sheets.

10. Write a html program to layers of information in web page.

11. Develop a Java script to determine whether the given number is a "PERFECT NUMBER "or not.

12. Develop a Java script to generate "ARMSTRONG NUMBERS" between the ranges 1 to 100.

13. Write a java script that reads an integer and displays whether it is a prime number or not.

14. Write a java script which accepts the text in lower case and displays the text in upper case

15. Write a java script program for user name and password validation using on click event.

Word press:

16. Installation and configuration of word press.
17. Create five pages on COVID – 19 and link them to the home page.
18. Add an external video link with size 640 X 360.
19. Create a user and assign a role to him.
20. Create a login page to word press using custom links

III. Lab References:

1. Web technologies by A.A.Puntambekar
2. Web Technologies by N.P.Gopalan,Eastern Economy Edition,2nd edition
3. Word press for Beginners, Dr.Andy Williams.
4. Professional word press, Brad Williams, David damstra, Hanstern.

Reference Materials on the Web/web-links:

1. https://onlinecourses.nptel.ac.in/noc17_cs22/course
2. http://www.codecademy.com/tracks/web
3. http://www.w3schools.com
4. https://www.w3schools.in/wordpress-tutorial/

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Title of the Paper: <mark>WEB APPLICATIONS DEVELOPMENT USING PHP AND MYSQL</mark>

Semester: V/VI

Course Code	SECCSCT02	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2015-16	Year of Offering: 2022 -23	Year of Revision: ----	Percentage of Revision: 30%

Course Objective: Upon successful completion of the course, participants should be able to: **List the major elements of the PHP & MySQL work and explain why PHP is good for web development**. Learn how to take a static website and turn it into a dynamic website run from a database using PHP and MySQL.

Course Outcomes: Students at the successful completion of the course will be able to:

CO$_1$	Learn basic structure and key concepts in PHP, Control statements and functions concept and related programs (PO5)
CO2	Know What is an Array concept related programs, What is an Object, various objects, Formatting strings, Date and time and related programs (PO5)
CO3	Learn importance of Forms, Combining HTML with PHP code. Importance of Cookies and Sessions related programs of forms cookies and sessions. (PO5)
CO4	Know importance of File concept in PHP how to Create, Open, Read and write data in file related programs, Knowing about Image creation, drawing, and modification image (PO7)
CO5	Know about Database concept of MySQL, Connection, Creation of Database, Table adding Record into it related programs (PO7)

PHP Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**The Building blocks of PHP** : Variables, Data Types, Operators and Expressions, Constants. **Flow Control Functions in PHP:** Switching Flow, Loops, Code Blocks and Browser Output. **Working with Functions:** What is function? ,Calling functions, Functions, Returning the values from User-Defined Functions, Variable Scope.	12
II	**Working with Arrays:** What are Arrays?, Creating Arrays, **Working with Objects** Creating Objects, Object Inheritance, **Working with Strings, Dates and Time-**Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.	12
III	**Working with Forms-**Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, **Working with Cookies and User Sessions-**Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables	14
IV	**Working with Files and Directories:** Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from File, Writing or Appending to a File. **Working with Images -**Understanding the Image-Creation Process, Drawing a New Image ,Modifying Existing Images ,Image Creation from User Input.	12
V	**Interacting with MySQL using PHP -**MySQL versus MySQLi Functions, Connecting to MySQL with PHP ,Working with MySQL Data, **Creating an Online Address Book -**Planning and Creating Database Tables, Creating Menu, Creating Record, Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.	10

Textbooks and References

1. JulieC.Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson education
2. Steven Holzner, PHP: The Complete Reference, McGraw-Hill
3. RobinNixon,LearningPHP,MySQL,JavaScript,CSS&HTML5,ThirdEditionO'reilly,2014
4. XueBaiMichaelEkedahl, The web warrior guide to Web Programming, Thomson (2006).
5. Web resources:
    e. http://www.codecademy.com/tracks/php
    f. http://www.w3schools.com/PHP
    g. http://www.tutorialpoint.com

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COMPUTER SCIENCE	SECCSCP02	2022-23	B.SC(MPCS,MCCS)

SEMESTER – V/VI   **PAPER – VII**   **Max. Marks 50**

Lab List: **Web Applications Development using PHP & MYSQL lab**

No. of Hours per week: 3   **External: 40**   **Internal: 10**   **Credits: 2**

I. Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Learn and implement basic programs in PHP, Control statements and functions concept (PO5)

CO2: Implement Basic programs in Object, various objects, Formatting strings, Date and time (PO5)

CO3: Learn and implement important programs of Forms, Combining HTML with PHP code. Importance of Cookies and Sessions..(PO5)

CO4: Implement programs on Files concept in PHP and on Image creation, drawing, and modification image (P05 & PO7)

CO5: Implement Database programs on MySQLi, Connection, Creation of Database, Table adding Record into it related programs (PO7)

II: Practical (Laboratory) Syllabus: **(30 Periods):** At least 8 Practical's.

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display today's date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in the new PHP page.
9. Write a PHP script to demonstrate passing variables with cookies.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to add, Modify, delete and fetch the rows in a Table.
12. Develop a PHP application to implement the following Operations
    a. Registration of Users.b.Insert the details of the Users.c.Modify the Details.
    d.Transaction Maintenance.

i.No of times Logged in (ii).Time Spent on each login. Ii. Restrict the user for three trials only.

iii. Delete the user if he spent more than 100 Hrs of transaction.

13. Write a PHP script to connect to the MySQL server from your website.
14. Write a program to read customer information like cust-no, cust-name, item purchased, and mob-no, from customer table and display all this information in table format on the output screen.
15. Write a program to edit the name of a customer to "Kiran" with cust-no =1, and to delete record with cust-no=3.
16. Write a program to read employee information like emp-no, emp-name, designation and salary from the EMP table and display all this information using table format in your website.
17. Create a dynamic web site using PHP and MySQL.

Textbooks and References: 1. JulieC.Meloni,SAMS Teach yourself PHP MySQL and Apache, Pearson Education(2007).

1. Steven Holzner, PHP: The Complete Reference, McGraw-Hill
2. RobinNixon,LearningPHP,MySQL,JavaScript,CSS&HTML5,ThirdEditionO'reilly.

Web resources: a.http://www.codecademy.com/tracks/php

b.http://www.w3schools.com/PHP

Title of the Paper: <mark>BIG DATA ANALYTICS USING R</mark>

Semester: V/VI

Course Code	CCSC605	Course Delivery Method	Class Room / Blended Mode – Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2022-23	Year of Offering: 2022-23	Year of Revision: ----	Percentage of Revision: 0%

Course Objective: Big data analytics examines large amounts of data to uncover hidden patterns, correlations and other insights. With today's technology, it's possible to analyze your data and get answers from it almost immediately – an effort that's slower and less efficient with more traditional business intelligence solutions.

Course Outcomes:

CO_1	Understand data and classification of digital data. (PO5)
CO2	Gain knowledge of technologies used in bigdata Analytics. (PO5, PO7)
CO3	Understand basics of R and control structures in R. (PO5)
CO4	Load data into R objects and manipulate them as needed. (PO5)
CO5	Create and edit visualizations with R (PO7)

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Introduction to Big data:** What is data, Classification of Digital Data-Structured Unstructured, semi-structured data, Characteristics of data, Evaluation of big data, Definition and challenges of big data, what is big data and why to use big data?	12
II	**Big data Analytics:** What is and isn't big data analytics? Classification of analytics, Importance of big data analytics, Technologies needed to meet challenges of big data, data science, Data scientist	12
III	**Introduction to R and getting started with R:** What is R? Why R? Advantages of R over other programming languages, Data types in R - logical, numeric, integer, character, double, Complex, raw, coercion, ls () command, Expressions, Variables and functions, control structures, Array, Matrix, Vectors, Factors, R packages	14
IV	**Exploring data in R**– Data frames-data frame access, Ordering data frames, functions for data frames dim(), nrow(), ncol(), str(), summary(), names(), head(), tail(), edit(), Load data frames—reading from .CSV files, Sub setting data frames, reading from tab separated value files, Reading from tables, merging data frames	12
V	**Data Visualization using R**: Reading and getting data into R (External Data),Using CSV files, XML files, Web Data, JSON files, Databases, Excel files, Working with R Charts and Graphs: Histograms, Boxplots, Bar Charts, Line Graphs, Scatter plots, Pie Chart	10

Prescribed Text Book:

1. Seema Acharya--Data Analytics using R, McGraw Hill education (India) Private Limited.

2. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Raj Kamal, PreetiSaxena,

McGraw Hill, 2018

Reference Books:

1. SeemaAcharya, SubhashiniChellappan --- Big Data and Analytics second edition, Wiley
2. Big Data, Big Analytics: Emerging Business intelligence and Analytic trends for Today's Business, Michael Minnelli, Michelle Chambers, and AmbigaDhiraj, John Wiley & Sons, 2013
3. An Introduction to R, Notes on R: A Programming Environment for Data Analysis and Graphics. W. N. Venables, D.M. Smith and the R Development Core Team

Course Focus: R for data science focuses on the language's statistical and graphical uses. When you learn R for data science, you'll learn how to use the language to perform statistical analyses and develop data visualizations. R's statistical functions also make it easy to clean, import and analyze data.

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COMPUTER SCIENCE	CCSC605P	2022-23	B.COM (CA)

SEMESTER – V   **PAPER – VI**   **Max. Marks 50**

Title**: BIG Data Analysis using Python lab**

No. of Hours per week: 3   External: 40   Internal: 10   Credits: 2   Pass Marks 20

I. Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Implement simple scripts or programs in R. (PO5)

CO2: Access online resources for R and import new function packages into the R workspace. (PO5, PO7)

CO3: Import, review, manipulate and summarize data-sets in R (PO5, PO7)

CO4: Explore data-sets to create testable hypotheses and identify appropriate statistical tests. (PO5, PO7)

CO5: Create and edit visualizations with R. (PO5, PO7)

II: Practical (Laboratory) Syllabus: (30 Periods)

1. Create a vector in R and perform operations on it (arithmetic operations, combining Vectors, retrieving elements of vector, assign names to vector elements).
2. Create integer, complex, logical, character data type objects in R and print their values And their class using print and class functions.
3. Create a matrix of values in R and extract data from matrix. (Ex. Second row thirdetc.) find transpose of matrix and combine two matrices using Rbind and Cbind   functions.
4. Create a list in R and perform operations on it like list slicing, sum and mean functions, head and tail functions and finally delete list using rm() function.
5. Create data frame in R and perform operations on it
6. Write code in R to find out whether a number is prime or not.
7. Print numbers from 1 to 100 using while loop and for loop in R.
8. Find the factorial of a number using recursion in R.
9. Perform arithmetic operations in R using switch case
10. Write a code in R to find out whether the number is Armstrong or not.
11. Program to find Multiplication table from 1 to 10 number input by user.
12. Import data into R from text and excel files using read.table() and read.csv() function.
13. Create a dataset and draw different types of graphics using plot, box plot, histogram, pair plot functions.
14. Create a dataset and draw different types of graphs using bar charts, pie chart functions.
15. Create custom contingency in R and perform operations on it.

III. Lab References:

1. Seema Acharya--Data Analytics using R, McGraw Hill education (India) Private Limited.
2. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Raj kamal, PreetiSaxena, McGraw Hill, 2018

Reference Materials on the Web/web-links:

1. **https://www.wiley.com/enbd/Big+Data,+Big+Analytics:+Emerging+Business+Intelligence+and+ Analytic+Trends+for+Today's+Businesses-p-9781118147603**

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Title of the Paper: Data Science using Python

Semester: V/VI

Course Code	CCSC606	Course Delivery Method	Class Room / Blended Mode – Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2022-23	Year of Offering: 2022 - 23	Year of Revision: ---	Percentage of Revision: 0%

Course Objective: The main objective of the course is to provide students with the basic concepts of Python, its syntax, functions and packages to enable them to write scripts for data manipulation and analysis. The course develops skills of writing and running a code using Python.

Course Outcomes: Students at the successful completion of the course will be able to:

CO_1	Understand the need and importance of data science.(PO5,PO7)
CO_2	Understand basic concepts of python and implementing control structures in python.(PO5)
CO_3	Implement strings and other data structures in python(PO5,PO7)
CO_4	Learn and Implement functions and modules in python.(PO5)
CO_5	Learn and Implement data cleaning and plotting using pandas.(PO5,PO7)

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**INTRODUCTION TODATA SCIENCE** Data science and its importance, Advantages of data science, The process of data science , Responsibilities of a data scientist, Qualifications of data scientists, Would you be a good data scientist?, Why to use python for data science?	12
II	**INTRODUCTION TO PYTHON** What is python?, Features of python, History of python, Writing and executing the python program, Basic syntax, Variables, Keywords, Data types , Operators, Indentation, Control Structures-Conditional statements—If, If-else, Nested if-else, Looping statements—For, While, Nested Loops, Break, Continue, Pass	12
III	**STRINGS AND DATA STRUCTURES** Strings - definition, accessing, slicing and basic operations, Lists - introduction, accessing list, operations, working with lists, functions and methods, Tuples - introduction, accessing tuple, operations, Dictionaries- introduction, accessing values in dictionaries, working with dictionaries.	14
IV	**FUNCTIONSANDMODULES** Functions- Defining a function, Calling a function, Types of functions, Function arguments, Local and global variables, Lambda and recursive functions, Modules---Math, Random, OS, Date and Time	10
V	**PANDAS** What is Pandas?, Series, Data Frame, Read CSV Files, Analyzing Data Frames, Data Correlations, Data Cleaning---Empty cells, Data in wrong format, Wrong data, Duplicates, Pandas Plotting-- plot () method, bar plot, hist plot, box plot, area plot, scatter plot, pie plot	12

Prescribed Books:

1. Steven cooper--- Data Science from Scratch, Kindle edition
2. Reemathareja—Python Programming using problem solving approach, Oxford Publication

Reference Books:

1.Wes McKinney--- Python for Data Analysis ,O'REILLY

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COMPUTER SCIENCE	CCSC606P	2022-23	B.COM (CA)

SEMESTER – V/VI	PAPER – VII	Max. Marks 50

Lab List: DATASCIENCE USING PYTHON LAB

No. of Hours per week: 3   External: 40   Internal: 10   Credits: 2

I. Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Implement simple programs in basics of python.(PO5)

CO2: Implement control structures in python.(PO5)

CO3: Implement data structures like strings, list, tuples, dictionaries in python.(PO5,PO7)

CO4:Implementation of data frames, data cleaning and plotting in pandas.(PO5,PO7)

II: Practical (Laboratory) Syllabus: (30 Periods)

1. Python Program to Find the Square Root

2. Python Program to Swap Two Variables

3. Python Program to Generate a Random Number

4. Python Program to check if a Number is odd or Even

5. Python Program to Find the Largest Among Four Numbers

6. Python Program to Check Prime Number

7. Python Program to Display the multiplication Table

8. Python Program to Print the Fibonacci sequence

9. Python Program to Check Armstrong Number

10. Python Program to Find the Sum of Natural Numbers

11. Python Program to Make a Simple Calculator

12. Python Program to Find Factorial of Number Using Recursion

13. Python Program to Add Two Matrices

14. Python Program to Multiply Two Matrices

15. Python Program to Check Whether a String is Palindrome or Not

16. Python Program to perform operations on strings.

17. Python Program to create a list and perform operations on its contents.

18. Python Program to perform operations on tuples.

19. Python Program to create a dictionary and print its content.

20. Python program to import data from CSV file using pandas.

21. Python program to demonstrate plots

III. Lab References:

1.   Reemathareja—Python Programming using problem solving approach,Oxford Publication

Reference Materials on the Web/web-links:

 1. https://www.w3schools.com/python/

 2. https://www.geeksforgeeks.org/python-basics/

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Autonomous -ISO 9001 – 2015 Certified
Title of the Paper: DATABASE MANAGEMENT SYSTEMS
Semester: III

Course Code	CSCT37	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	25
No. of Lecture Hours / Week	4	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2021	Year of Offering: 2021-22	Year of Revision: ----	Percentage of Revision: 0%

Course Objective: The main objective of the database is **to ensure that data can be stored and retrieved easily and effectively**. It is a compilation of data (records) in a structured way. In a database, the information is stored in a tabular form where data may or may not interlinked.

Course Outcomes:

CO$_1$	Understand database concepts and design. (PO5,P07)
CO2	Create databases using structured query language. (PO5, P07)
CO3	Apply data manipulation commands in SQL. (PO5, P07)
CO4	Learn the programming basics of PL/SQL. (PO5, P07)
CO5	Implementation of cursors in PL/SQL. (PO5, P07)

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	**Database Concepts-A Relational approach**: Database - Relationships - DBMS - Relational data model - Integrity rules - Theoretical relational languages. **Database Design**: Data modeling -Dependency - Database design - Normal forms - Dependency diagrams – Denormalization.	12
II	**Structured Query Language (SQL):** Introduction – DDL - Naming rules and conventions - D a t a t ypes-Constraints- C reating a table- Displaying t able information - Altering an existing table – Dropping, renaming, and truncating table - Table types	12
III	**Working with tables**: DML - Adding a new Row/Record - Customized prompts - Updating and deleting an existing rows/records - Retrieving data from table - Arithmetic operations - Restricting data with WHERE clause - Sorting - Substitution variables - DEFINE command - CASE structure. **Functions and Grouping**: Built-in functions - Grouping data. **Joins and Views**: Join - join types-**Views:** Views - Creating a view - Removing a view - Altering a view.	12
IV	**PL/SQL:** Fundamentals - Block structure - comments - Data types – Other data types - Variable declaration - Assignment operation - Bind variables - Substitution variables - Printing. **Control Structures and Embedded SQL**: Control structures - Nested blocks - SQL in PL/SQL - Data manipulation - Transaction control statements	12
V	**PL/SQL Cursors and Exceptions**: Cursors - Implicit & explicit cursors and attributes - cursor FOR loops - SELECT…FOR UPDATE - WHERE CURRENT OF Clause - cursor with parameters - Cursor variables - Exceptions - Types of exceptions - Records - Tables -Procedures -Functions -Triggers	12

Course Delivery method: Face-to-face / Blended

Course has focus on: Skill Development.

Websites of Interest:
- https://www.tutorialspoint.com/dbms/index.htm
- https://www.tutorialspoint.com/plsql/index.htm

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DATABASE MANAGEMENT SYSTEMS

COMPUTER SCIENCE	CSCP37	2022-23	B.Sc.(MPCS,MCCs, MSCS)

Year of Introduction: 2021 **Year of offering: 2021**

Semester: III **Credits: 1**

Hours Taught: 30 hrs. Per Semester **Max.Time**: 3 Hours

Course Prerequisites (if any): Basic knowledge in computers and internet concepts.

Course Description: This course focuses towards Database System Concepts and Architecture, ER models, relational algebra relational calculus, SQL and PL/SQL.

Course Objectives:

1. Enhance the knowledge and understanding of Database concepts and design.

2. Enhance the knowledge of the processes of Database Development using SQL

3. Enhance the knowledge of the processes of Database manipulation using SQL

4. Develop efficient PL/SQL programs to access Oracle databases

Course Outcomes: At the end of this course, students should be able to:

CO1: Understand database concepts and design. (PO5, P07)

CO2: Create databases using structured query language. (PO5, P07)

CO3: Apply data manipulation commands in SQL. (PO5, P07)

CO4: Learn the programming basics of PL/SQL. (PO5, P07)

CO5: Implementation of cursors in PL/SQL. (PO5, P07)

LAB LIST

1. Using Different operators
2. Using Control Structures
3. Implement Built-in functions
4. Implement update and Alter table
5. Implementing PL/SQL Block
6. Implement PL/SQL table and record
7. Using Functions
8. Using Cursors
9. Using Triggers

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(With Effect from Academic Year 2021-22)

Title of the Paper: Problem solving in C

Semester: III   **CLASS B.Com(E-Commerce- Computers)**

Course Code	**CSCT11B**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	25
No. of Lecture Hours / Week	4	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2020-21	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Course Objective

This course aims to provide exposure to problem-solving through programming and introduce the concepts of the C Programming language.

Course Learning Outcomes:

Course Outcome No	Upon successful completion of the course, a student will be able to:	Program Outcome No.
CO1	Understand the evolution & functionality of Digital Computers and develop an algorithm for solving a given problem.	PO1, PO7, PSO1, PSO4
CO2	Understand tokens and control structures in C.	PO1, PO7, PSO1, PSO4
CO3	Understand arrays and strings and implement them.	PO1, PO7, PSO1, PSO4
CO4	Understand the right way of using functions, pointers, structures and unions in C	PO1, PO7, PSO1, PSO4
CO5	Develop and test programs written in C files	PO1, PO7, PSO1, PSO4

UNIT I   **12 periods**

General Fundamentals: Introduction to computers: Block diagram of a computer, characteristics and limitations of computers, applications of computers, types of computers, computer generations.

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms, Flow Charts, Programming Languages – Generations of Programming Languages – Structured Programming Language- Design and Implementation of Correct, Efficient and Maintainable Programs.

UNIT II   **12 periods**

Introduction to C: Introduction – Structure of C Program – Writing the first C Program –File used in C Program – Compiling and Executing C Programs – Using Comments –
Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C- Operators in C-Programming Examples.

Decision Control and Looping Statements: Introduction to Decision Control Statements– Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – goto Statement.

UNIT III   **10 periods**

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array– Operations on Arrays – one dimensional, two dimensional and multi-dimensional arrays, character handling and strings.

UNIT IV   **14 periods**

Functions: Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions.

Structure, Union, and Enumerated Data Types: Introduction – Nested Structures – Arrays of Structures – Structures and Functions– Union – Arrays of Unions Variables – Unions inside Structures – Enumerated Data Types.

UNIT V   **12 periods**

Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers - Passing Arguments to Functions using Pointer – Pointer and Arrays – Memory Allocation in C Programs – Memory Usage – Dynamic Memory Allocation – Drawbacks of Pointers

Files: Introduction to Files – Using Files in C – Reading Data from Files – Writing Data to Files – Detecting the End-of-file – Error Handling during File Operations – Accepting Command Line Arguments.

BOOKS

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language" - Pearson publications.
3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
4. YashavantKanetkar - Let Us 'C' – BPB Publications.

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work

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Semester III	Course Code	Course Title	Credits	Prds
B.Com.(E-Commerce-Computers)	CSCP11B	Problem Solving in CLab	1	30

Course Outcome No	Upon successful completion of this course, students should have the knowledge and skills to:	Program Outcome No
CO1	Apply logical skills to analyse a given problem	PO1, PO7, PSO1, PSO4, PSO2
CO2	Design an algorithmic solution for a given problem	PO1, PO7, PSO1, PSO4, PSO2
CO3	Write a maintainable C program according to coding standards for a given algorithm	PO1, PO7, PSO1, PSO4, PSO2
CO4	Debug a given program	PO1, PO7, PSO1, PSO4, PSO2
CO5	Execute the C program	PO1, PO7, PSO1, PSO4, PSO2

Experiments List
Cycle-I

Week 1:
Write a C program to check whether the given two numbers are equal, bigger or smaller?
Week 2:
Write a C program to perform arithmetic operations using Switch...case?
Week 3:

- Write a program to find the sum of individual digits of a positive integer.

- Write a program to check whether the given number is Armstrong or not.

Week 4:
Write a program to generate the first N terms of the Fibonacci sequence.
Week 5:
Write a program to find both the largest and smallest number in a list of integer values
Week 6:

- Write a program that uses functions to add two matrices.

- Write a program for multiplication of two n X n matrices.

Week 7:

Write a program to demonstrate refection of parameters in swapping of two integer values using Call by Value& Call by Address.
Week 8:
Write a program to calculate factorial of given integer value using recursive functions.

Cycle-II

Week 9:
Write a program to search an element in a given list of values.
Week 10:
Write a program to illustrate pointer arithmetic.
Week 11:
Write a program to sort a given list of integers in ascending order.
Week 12:
Write a program to calculate the salaries of all employees using Employee (ID, Name, Designation, Basic Pay, DA, HRA, Gross Salary, Deduction, Net Salary) structure.

     a. DA is 30 % of Basic Pay
     b. HRA is 15% of Basic Pay
     c. Deduction is 10% of (Basic Pay + DA)
     d. Gross Salary = Basic Pay + DA+ HRA
     e. Net Salary = Gross Salary - Deduction

Week 13:
Write a program to perform various string operations.
Week 14:
Write a program to read the data character by character from a file.
Week 15:
Write a program to create Book (ISBN, Title, Author, Price, Pages, Publisher) structure and store book details in a file and perform the following operations

     a. Add book details
     b. Search a book details for a given ISBN and display book details, if available
     c. Update a book details using ISBN
     d. Delete book details for a given ISBN and display list of remaining Books.

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Title of the Paper PROGRAMMING WITH C & C++

Semester: III

Course Code	CABT31A	Course Delivery Method	Class Room / Blended Mode - Both
Credits	**3**	CIA Marks	25
No. of Lecture Hours / Week	4	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2021	Year of Offering: 2021-22	Year of Revision: ----	Percentage of Revision: 0%

Course Objective: To learn the fundamental programming concepts and methodologies which are essential to building good C/C++ programs.

Course Outcomes:

CO$_1$	To understand the meaning and generations of a programming language and to learn about c tokens.(PO5, PO7)
CO2	To learn about operators and conditional statements in C. (PO5, PO7)
CO3	To Gain knowledge about functions and to learn how to work with arrays- knowledge about strings and its functions. (PO5, PO7)
CO4	To learn about the concepts of structures and unions. (PO5, PO7)
CO5	To understand about Object-Oriented Programming concepts using CPP (PO5, PO7)

	Syllabus	
Unit	**Learning Units**	**Lecture Hours**
I	**INTRODUCTION TO C LANGUAGE, VARIABLES, DATA TYPES** **Introduction:** Introduction to Programming languages and Generations of Programming languages, Structure of C Program , Writing the first C Program, Files used in C Program, Compiling and Executing C- Programs, Using Comments, Keywords, Identifiers, Basic Data Types in C, Variables- Numeric, Character, Declaring, Initializing, Constants- Integer, Float, Character, String Declaring constants, I/O Statements in C- Formatting I/O, Printf (), scanf ().	10
II	**Operators:** Operator and its types in C - Arithmetic, Relational, Equality, Logical, Unary, Conditional, Bitwise, Assignment, Comma, Size of. **WORKING WITH CONTROL STATEMENTS, LOOPS:** Introduction to Decision Control Statements , Conditional Branching Statements – If, If-Else, If-Else-if, Switch Case, Iterative or Looping Statements – While, Do-While, For , Break and Continue Statement , Go to Statement	10
III	**FUNCTIONS, ARRAYS** **Functions :** Introduction, Using Functions, Function declaration/prototype, Function Definition, Function Call, Scope of variables. **Arrays :** Introduction, Declaration of Arrays, Accessing elements of the Array, One dimensional array declaration and initialization with example, Two-dimensional array declaration and initialization with examples.	15
IV	**STRINGS:** Introduction to strings and string handling functions **Structures & Unions:** Introduction to structures, Structure Declaration, Typedef, Initialization, accessing the members of a structure, Nested structures, Arrays of structures, Unions – Declaring, Accessing and Initialization, Differences between Structures and Unions.	12
V	**OBJECT ORIENTED CONCEPTS USING C++** Introduction to Object Oriented Programming, Object Oriented Concepts, Class-Object-Inheritance-Polymorphism- Encapsulation-Abstraction, Structure of C++ program, Differences between C & CPP, Input and output statements in CPP. **Operators & Data types:** Operators in CPP, Data types in CPP, Operator Overloading	13

Text Books:

	Author	Title	Publisher
1	Reema Thareja	Introduction to C programming	Oxford University Press
2	E. Balagurusamy	Objected Oriented Programming with C++	McGraw Hill.

Reference Text Books:

	Author	Title	Publisher
1	E Balagurusamy	Computing Fundamentals & C Programming	Tata McGraw-Hill, 2008
2	Ashok N Kamthane	Programming with ANSI and Turbo C	Pearson Publisher, 2002.
3	Y.Kanetkar	Let Us C++:	BPB

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(With Effect from Academic Year 2020-21)
PROGRAMMING WITH C & C++ LAB

COMPUTER SCIENCE	CABP31A	2022-23	B. Com (Computer Applications)

Semester: III   **Credits: 1**
Hours Taught: 30 hrs. Per Semester   **Max.Time**: 3 Hours

Course Objective:
The purpose of this course is to introduce students to the field of programming using C language and CPP. The students will be able to enhance their analyzing and programming skills and use the same for writing their own programs in C language and Using classes in CPP language.

Course Outcomes: At the end of this course the student is
able toCO1:Use various operators in C programming
CO2:Implement decision and looping control statements

CO3:Passing parameters to functions & Accessing elements of an array and creation of one dimensional and two-dimensional arrays.
.CO4:Implementing string functions and structures, unions
conceptsCO5:Implement basic OOP concepts in CPP.
LAB LIST
1. Write a C program to calculate the expression: ((a*b)/c)+(a+b+c)
2. Write a C program to calculate (a+b+c)3
3. Write a C program to convert temperature from
    a) Celsius to Fahrenheit
    b) Fahrenheit to Celsius
4. Write a C program to calculate compound Interest
5. Write a C program to find biggest of three numbers
6. Write a C program to read student marks in five subjects and calculate total and average
7. Write a C program to convert hours into seconds
8. Write a C program to display number of days in given month using switch case
9. Write a C program to find biggest of two numbers using switch case
10 Write a C program to find whether the given number is prime or not
11 Write a C program to check whether the given string is palindrome or
not12 Write a C program to find the reverse of a given number using
functions 13 Write a C program to swap two numbers using functions
14. Write a C program to sort the given numbers in an array
15. Write a C program to perform addition of two matrices
16. Write a C program to display student details using structures
17. Write a CPP program to find addition of three numbers using classes
18. Write a CPP program to find biggest of three numbers using classes
19. Write a CPP program to find whether a person is eligible to vote or not using classes
20. Write a CPP program to implement operator overloading concept

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Title of the Paper: Problem solving in C
Semester: I   **SECTIONS: B.Sc. (MPCS / MCCS/ MSCS)**

Course Code	**CSCT11B**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2020-21	Year of Offering: 2021 - 22	Year of Revision: Nil	Percentage of Revision: 0%

Course Objective

This course aims to provide exposure to problem-solving through programming and introduce the concepts of the C Programming language.

Course Learning Outcomes:

Course Outcome No	Upon successful completion of the course, a student will be able to:	Program Outcome No.
CO1	Understand the evolution & functionality of Digital Computers and develop an algorithm for solving a given problem.	PO1, PO7, PSO1, PSO4
CO2	Understand tokens and control structures in C.	PO1, PO7, PSO1, PSO4
CO3	Understand arrays and strings and implement them.	PO1, PO7, PSO1, PSO4
CO4	Understand the right way of using functions, pointers, structures and unions in C	PO1, PO7, PSO1, PSO4
CO5	Develop and test programs written in C files	PO1, PO7, PSO1, PSO4

UNIT I   12 periods

General Fundamentals: Introduction to computers: Block diagram of a computer, characteristics and limitations of computers, applications of computers, types of computers, computer generations.

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms, Flow Charts, Programming Languages – Generations of Programming Languages – Structured Programming Language- Design and Implementation of Correct, Efficient and Maintainable Programs.

UNIT II   12 periods

Introduction to C: Introduction – Structure of C Program – Writing the first C Program –File used in C Program – Compiling and Executing C Programs – Using Comments –
Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C- Operators in C- Programming Examples.

Decision Control and Looping Statements: Introduction to Decision Control Statements– Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – goto Statement.

UNIT III   10 periods Arrays:

Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array– Operations on Arrays – one dimensional, two dimensional and multi-dimensional arrays, character handling and strings.

UNIT IV   14 periods Functions:

Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions.

Structure, Union, and Enumerated Data Types: Introduction – Nested Structures – Arrays of Structures – Structures and Functions– Union – Arrays of Unions Variables – Unions inside Structures – Enumerated Data Types.

UNIT V   12 periods

Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers - Passing Arguments to Functions using Pointer – Pointer and Arrays – Memory Allocation in C Programs – Memory Usage – Dynamic Memory Allocation – Drawbacks of Pointers

Files: Introduction to Files – Using Files in C – Reading Data from Files – Writing Data to Files – Detecting the End-of-file – Error Handling during File Operations – Accepting Command Line Arguments.

BOOKS

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language" - Pearson publications.
3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
4. YashavantKanetkar - Let Us 'C' – BPB Publications.

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;
1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports like "Creating Text Editor in C".
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work

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(With Effect from Academic Year 2021-22)

Semester I	Course Code	Course Title	Credits	Prds
B.Sc.(MPCS / MCCS/ MSCS)	CSCP11B	Problem Solving in C Lab	1	30

Course Outcome No	Upon successful completion of this course, students should have the knowledge and skills to:	Program Outcome No
CO1	Apply logical skills to analyse a given problem	PO1, PO7, PSO1, PSO4, PSO2
CO2	Design an algorithmic solution for a given problem	PO1, PO7, PSO1, PSO4, PSO2
CO3	Write a maintainable C program according to coding standards for a given algorithm	PO1, PO7, PSO1, PSO4, PSO2
CO4	Debug a given program	PO1, PO7, PSO1, PSO4, PSO2
CO5	Execute the C program	PO1, PO7, PSO1, PSO4, PSO2

Experiments List
Cycle-I

Week 1:
Write a C program to check whether the given two numbers are equal, bigger or smaller?
Week 2:
Write a C program to perform arithmetic operations using Switch...case?
Week 3:

- Write a program to find the sum of individual digits of a positive integer.

- Write a program to check whether the given number is Armstrong or not.

Week 4:
Write a program to generate the first N terms of the Fibonacci sequence.
Week 5:
Write a program to find both the largest and smallest number in a list of integer values
Week 6:

- Write a program that uses functions to add two matrices.

- Write a program for multiplication of two n X n matrices.

Week 7:

Write a program to demonstrate refection of parameters in swapping of two integer values using Call by Value& Call by Address.
Week 8:
Write a program to calculate factorial of given integer value using recursive functions.

Week 9:
Write a program to search an element in a given list of values.
Week 10:
Write a program to illustrate pointer arithmetic.
Week 11:
Write a program to sort a given list of integers in ascending order.
Week 12:
Write a program to calculate the salaries of all employees using Employee (ID, Name, Designation, Basic Pay, DA, HRA, Gross Salary, Deduction, Net Salary) structure.

  a. DA is 30 % of Basic Pay
  b. HRA is 15% of Basic Pay
  c. Deduction is 10% of (Basic Pay + DA)
  d. Gross Salary = Basic Pay + DA+ HRA
  e. Net Salary = Gross Salary - Deduction

Week 13:
Write a program to perform various string operations.
Week 14:
Write a program to read the data character by character from a file.
Week 15:
Write a program to create Book (ISBN, Title, Author, Price, Pages, Publisher) structure and store book details in a file and perform the following operations

  a. Add book details
  b. Search a book details for a given ISBN and display book details, if available
  c. Update a book details using ISBN
  d. Delete book details for a given ISBN and display list of remaining Books.

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Title of the Paper: INFORMATION TECHNOLOGY
Semester: I   **SECTIONS: B.Com (CA)**

Course Code	**CSBT11A**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	5	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2020-21	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

INFORMATION TECHNOLOGY

Objective:
It provides to learn computer basics and basic principles of using Windows operation system and be able to access the Internet, data communication, Software, hardware and various new technologies in information technology.

Course Outcomes:

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to
CO1	Understand fundamental concepts of a computer and its basic components
CO2	Understand basic functioning of an operating system and customizing Windows Desktop
CO3	Analyse type of soft wares and programming languages
CO4	Have knowledge in basic Network and Data Communication Concepts
CO5	Understand the need of data mining and get familiarize with basics of new concepts like KDD, OLAP

UNIT-I: INTRODUCTION: **13Periods**
     Introduction to computers
     Generations of computers
     An overview of computer system - Types of computers
     Input & Output Devices.
    Hardware: Basic components of a computer system- Control unit– ALU- Input/outputfunctions.
     Memory – RAM – ROM – EPROM - PROM and Other types of memory.

UNIT-II: OPERATING SYSTEM (OS):   **12Periods**
     Meaning - Definition & Functions.
     Types of OS - Booting process
     DOS – Commands (internal & external) - Wild card characters
     Windows: Using the Start Menu –Control Panel – Using multiple
     Windows – Customizing the Desktop – Windows accessories (Preferably latest version of
     windows or Linux Ubuntu).

Unit-III: SOFTWARE: 15Periods

System software and application
software.
Operating system windows OS,
Mobile device operating system and notebook operating systems
Application software Types of personal application software
Spread sheet-data management
Word processing
Desktop publishing
Graphics, CAD, CAM, CIM
Programming Languages
Assembly language
Procedural language, non-procedural language, natural programming language.
Hypertext mark-up language, modelling language, object-oriented programming language.

Unit-IV: DATA COMMUNICATION: 20 Periods

Telecommunication and Networks Communication media& channel cable media
Broad cast media channels twisted pair
Coaxial cable, fibers optical cable, micro wave, satellite, radio, cellular radio,
infrared global positioning system.
Introduction, Analog and Digital signals, modulation need of modulations, modems.
Telecommunication System communication processors:
Modem
Multiplexers
Front –end-processor.
Networks LAN, WAN, VAN, virtual private network (VPN).
Internet, intranet and Extranets
The evolution of the internet, service provided by the internet, World Wide Web.

Unit-V: NEW TECHNOLOGIES: 10 Periods

New technologies in Information Technology:
Introduction to hyper media, artificial intelligence and business intelligence,
knowledgediscovery in database (KDD)
Data warehouse and data marts. Data mining and OLAP.

Student Activity:
Students have to submit assignments and give seminars on various topics allotted to them.
Total of 5 Hrs is allotted for student seminars. Student activity also includes gathering of information
related to latest technologies in computers.

Library Activity:
Students will visit library in their allotted time and will refer various text books to gather information for
their assignments.

TEXT/ REFERENCE BOOKS:
1. B.E.V.L.Naidu, V.V.. Devi Prasad Konti, Ganti Naga Srikanth, Himalaya publishing House.
2. Introduction to Computers: Peter Norton, McGraw Hill.

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Title of the Paper: **COMPUTER APPLICATIONS**   Semester: I

Course Code	**CCSE101**	Course Delivery Method	Class Room / Blended Mode –
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2020-21	Year of Offering: 2022-23	Year of Revision: ----	Percentage of Revision: 0%

COURSE OBJECTIVES:

It provides to learn computer basics and basic principles of using Windows operation system and be able to access the Ms-Office, Power Point, Excel and various new technologies in information technology.

Course Outcomes:

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to
CO1	Understand fundamental concepts of a computer and its basic components
CO2	Understand basic functioning of an Ms-Office and MS-Word Window Components Windows Desktop
CO3	Analyze type of soft ware's and programming languages
CO4	Have knowledge in MS-Excel and MS Access
CO5	Understand the need of Finding, Sorting and Displaying Data and get familiarize

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(With Effect from Academic Year 2021-'22)

COMPUTER SCIENCE	CCSE101	2022-23	B.Com(E-Commerce-Computes)

SEMESTER – I   PAPER – I   Max. Marks 70   Pass Marks 28   Total Hrs: 60

Syllabus: Computer Applications   **NO. Of Hrs**: 4   **Credits**: 3

Unit-I: MS-Word   10 Hrs

Features of MS-Word – MS-Word Window Components – Creating, Editing, Formatting and Printing of Documents – Headers and Footers – Insert/Draw Tables, Table Auto format – Page Borders and Shading – Inserting Symbols, Shapes, Word Art, Page Numbers, Equations – Spelling and Grammar – Thesaurus – Mail Merge

Unit-II: MS-PowerPoint   10 Hrs

Features of PowerPoint – Creating a Blank Presentation - Creating a Presentation using a Template - Inserting and Deleting Slides in a Presentation – Adding Clip Art/Pictures - Inserting Other Objects, Audio, Video - Resizing and Scaling of an Object – Slide Transition – Custom Animation

Unit-III: MS-Excel   10Hrs

Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Formulae, Referencing cells – Inserting Rows/Columns – Changing column widths and row heights, auto format, changing font sizes, colors, shading and attributes – Data Sorting and Filters – Functions – Functions requiring Addins, Functions by category Creating different types of Charts

Unit-IV: MS Access: 12Hrs
Creating a Simple Database and Tables: Features of Ms-Access, Creating a Database, Parts of Access. Tables: table creation using design view, table wizard, data sheet view, import table, link table. Forms: The Form Wizard, design view, columnar, tabular, data sheet, chart wizard.

Unit- V: Finding, Sorting and Displaying Data: 12Hrs
Queries and Dynasts, Creating and using select queries, Returning to the Query Design, Multi-level sorts, Finding incomplete matches, showing All records after a Query, saving queries - Crosstab Queries. Printing Reports: Form and Database Printing..

Reference Books:

1.Ron Mansfield, Working in Microsoft Office, Tata McGraw Hill(2008)

2.Ed Bott, Woody Leonhard, Using Microsoft Office 2007, Pearson Education(2007)

3. Sanjay Saxsena, Microsoft Office, 4.Microsoft Office, BPB Publications

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(With Effect from Academic Year 2019-'20)

COMPUTER SCIENCE	CCSEP101	2022-23	B.Com. (E-COMMERCE)

SEMESTER – I   PAPER – I   Max. Marks 50   Pass Marks 20   Total Hrs: 30

COMPUTER APPLICATIONS LAB

Ms-Word

1. Create a vesting Card
2. Create a template for organization using Header & Footer
3. Inserting tables, pictures, Charts
4. Macros
5. Mail merge Procedure

Ms-Excel

1. Create an electronic spreadsheet in which you enter the following decimal numbers and convert into Octal, Hexadecimal and Binary numbers vice versa. Decimal Numbers: 35, 68, 95, 165, 225, 355, 375, 465. Binary Numbers: 101, 1101, 111011, 10001, 110011001, 111011111.
2. The ABC Company shows the sales of different products for 5 years. Create column chart, 3D-column and Bar chart for the following data YEAR PRODUCT-1 PRODUCT-2 PRODUCT-3 PRODUCT-4 2003 1000 800 900 10002004 800 80 500 9002005 1200 190 400 8002006 400 200 300 1000 2007 1800 400 400 1200
3. Create a suitable examination data base and find the sum of the marks(total) of each student and respective class secured by the student rules:
Pass if marks in each subject >=35 Distinction if average>=75 First class if average>=60 but <75 Second class if average>=50 but <60 Third class if average>=35 but <50
Fail if marks in any subject is <35 Display average marks of the class, subject wise and pass percentage
4. Create an electronic spread sheet in which you enter date and time functions in Excel
5. Create a electronic spread sheet in statistical and mathematical functions in Excel

MS-PowerPoint

1. Make a Power point presentation on your strengths, weaknesses, hobbies, factors that waste your time.
2. Make a Power point presentation to represent your College profile.
3. Make a Power point presentation of all the details of the books that you had studied in B.Sc. First Year.
4. Create a Presentation without Animation.

MS-ACCESS

1. Create a database using MS-ACCESS with at least 5 records table1 structure: register number , name, dob, gender, class table2 structure: register number m1 m2 m3 m4 m5 total maintain the relationship between two tables with register number as a primary key and answer the following quarries: show the list of students with the following fields as one query register number name gender total marks
2. Maintain the relationship between above two tables with register number as a primary key and answer the following reports: reports must have following columns report1 with register number, name, marks of all subjects and 90 hrs (3 hrs/ week) computer science 10 of 44 total report2 with register number, total , percentage.
3. Create a database using ms-access with at least 5 records table1 structure: emp-code emp-name age gender dob table2 structure: emp-code basic-pay maintain the relationship between two tables with emp-code as a primary key generate the following reports: report1: emp-code emp-name basic-pay da,hra gross-salary report2: emp-code emp-name age gender gross-salary.

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DEPARTMENT OF COMPUTER SCIENCE

2022-23 (EVEN SEMESTER)
HIGHLIGHTED SYLLABUS OF COMPUTER SCIENCE

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability

Skill-Development

Entrepreneurship

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Title of the Paper: WEB INTERFACE DESIGNING TECHNOLOGIES

Semester: V/VI

Course Code	SECCSCT01	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2022-23	Year of Offering: 2022 -23	Year of Revision: ----	Percentage of Revision: 0%

Course Objective: To create web elements like buttons, banners & Bars and of course complete UI designs. Forms and validations for your website. Setting up page layout, color schemes, contract, and typography in the designs. Writing valid and concise code for web pages.

Course Outcomes: Students at the successful completion of the course will be able to:

CO$_1$	Understand web application and static web page using Html. (PO5)
CO2	Gain knowledge about various designing of style sheets. (PO5)
CO3	Demonstrate skills regarding creation of an interface to dynamic website.(PO7)
CO4	Gain knowledge about various advantages of XML and validating schema(PO5)
CO5	Learn how to install word press and gain the knowledge of installing various plugins to use in their websites. (PO5,PO7)

Course Details

Unit	Learning Units	Lecture Hours
I	**Web Designing, HTML** **Web Designing:** Introduction To Web Designing, Difference Between Web Applications And Desktop Applications. **HTML:** Introduction To HTML, Introduction To HTML, Headings, Paragraphs Styles &Colors, HTML Formatting, Quotations, Comments, Hyperlinks, Lists, Using colors and images, Tables, Multimedia Objects - Video, Audio, Plugins, You Tube, Frames, Forms	12
II	**CSS, HTML API'S** **CSS**: Introduction, Using Styles, Simple Examples, Defining Your Own Styles, Properties and Values in Styles, Style Sheets, Formatting blocks of information, Layers, CSS Combinators, Pseudo Class, Pseudo Elements, Opacity, ToolTips, Image Gallery, CSS Forms, CSS Counters, CSS Responsive.**HTML API'S:** Geolocation, Drag/drop, local storage, HTML SSE	12
III	**Client side Validation:**Introduction to JavaScript: What Is DHTML?, JavaScript Basics,Variables,StringManipulations,MathematicalFunctions,Statements,Operators,Arrays,Functions.Objects in JavaScript –Data and Objects In JavaScript, Regular Expressions, Exception Handling. DHTML with JavaScript :Data Validation, Opening a New Window, Messages and Confirmations, The Status Bar, Different Frames, Rollover Buttons, Moving Images	14
IV	**XML:** Introduction to xml, How to write a xml document, Elements and attributes, Comments in xml, Namespace in xml, Xml css, Advantages of xml, Uses of xml, xml schema, data types, simple types, complex types ,Validating DTD,XSD.	12
V	**Word press** Introduction to word press, servers like wamp, bitnami e.tc, installing and configuring word press, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts, working with media-Adding, editing, deleting media elements, working with widgets, menus.	10

Text Book/ references / e-books/websites

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley
2. Web technologies by A.A.Puntambekar
3. Web Technologies by N.P.Gopalan,Eastern Economy Edition,2nd edition
4. Paul S.WangSanda S. Katila, an Introduction to Web Design plus Programming, Thomson
5. Head First HTML and CSS, Elisabeth Robson, Eric Freeman, O'Reilly Media Inc.
6. An Introduction to HTML and JavaScript: for Scientists and Engineers, David R. Brooks.
7. Schaum's Easy Outline HTML, David Mercer, Mcgraw Hill Professional.
8. Word press for Beginners, Dr.Andy Williams.
9. Professional word press, Brad Williams, David damstra, Hanstern.
10. Web resources:
    a. http://www.codecademy.com/tracks/web
    b. http://www.w3schools.com
    c. https://www.w3schools.in/wordpress-tutorial/ d.http://www.homeandlearn.co.uk

elements in word press(CO5,L2)

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(With Effect from Academic Year 2022-23)

COMPUTER SCIENCE	SECCSCP01	2022-23	B.SC(MPCS,MCCS)

SEMESTER – V/VI   **PAPER – VI**   **Max. Marks 50**

Lab List: WEB INTERFACE DESIGNING TECHNOLOGIES LAB

No. of Hours per week: 3   External: 40   Internal: 10   Credits: 2

I. Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Create a basic website with the help of HTML and CSS.(PO5)

CO2: Acquire the skill of installing word press and various plugins of Word press.(PO5)

CO3: Create a static website with the help of Word press..(PO5,PO7)

CO4: Create an interface for a dynamic website.(PO5,PO7)

CO5: Apply various themes for their websites using Word press.(PO7)

II.Practical (Laboratory) Syllabus: (30 periods)

HTML and CSS:

1. Create an HTML document with the following formatting options:
(a)Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font (Type, Size and Color), (f) Background (Colored background/Image in background), (g) Paragraph, (h) Line Break, (i) Horizontal Rule, (j) Pre tag
2. Create an HTML document which consists of:
(a) Ordered List (b) Unordered List (c) Nested List (d) Image
3. Create a form using HTML which has the following types of controls:
(a) Text Box (b) Option/radio buttons (c) Check boxes (d) Reset and Submit buttons
4.Embed a calendar object in your web page.
5. Create an applet that accepts two numbers and perform all the arithmetic operations on them.
6. Create nested table to store your curriculum with image.
7. Create a form that accepts the information from the subscriber of a mailing system.
8. Create a help file as follows:

9. Write a html program including style sheets.
10. Write a html program to layers of information in web page.
11. Develop a Java script to determine whether the given number is a "PERFECT NUMBER "or not.
12. Develop a Java script to generate "ARMSTRONG NUMBERS" between the ranges 1 to 100.
13. Write a java script that reads an integer and displays whether it is a prime number or not.
14. Write a java script which accepts the text in lower case and displays the text in upper case
15. Write a java script program for user name and password validation using on click event.

Word press:

16. Installation and configuration of word press.
17. Create five pages on COVID – 19 and link them to the home page.
18. Add an external video link with size 640 X 360.
19. Create a user and assign a role to him.
20. Create a login page to word press using custom links

III. Lab References:

1. Web technologies by A.A.Puntambekar
2. Web Technologies by N.P.Gopalan,Eastern Economy Edition,2nd edition
3. Word press for Beginners, Dr.Andy Williams.
4. Professional word press, Brad Williams, David damstra, Hanstern.

Reference Materials on the Web/web-links:

1. https://onlinecourses.nptel.ac.in/noc17_cs22/course
2. http://www.codecademy.com/tracks/web
3. http://www.w3schools.com
4. https://www.w3schools.in/wordpress-tutorial/

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Title of the Paper: <mark>WEB APPLICATIONS DEVELOPMENT USING PHP AND MYSQL</mark>

Semester: V/VI

Course Code	**SECCSCT02**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2015-16	Year of Offering: 2022 -23	Year of Revision: ----	Percentage of Revision: 30%

Course Objective: Upon successful completion of the course, participants should be able to: **List the major elements of the PHP & MySQL work and explain why PHP is good for web development**. Learn how to take a static website and turn it into a dynamic website run from a database using PHP and MySQL.

Course Outcomes: Students at the successful completion of the course will be able to:

CO$_1$	Learn basic structure and key concepts in PHP, Control statements and functions concept and related programs (PO5)
CO2	Know What is an Array concept related programs, What is an Object, various objects, Formatting strings, Date and time and related programs (PO5)
CO3	Learn importance of Forms, Combining HTML with PHP code. Importance of Cookies and Sessions related programs of forms cookies and sessions. (PO5)
CO4	Know importance of File concept in PHP how to Create, Open, Read and write data in file related programs, Knowing about Image creation, drawing, and modification image (PO7)
CO5	Know about Database concept of MySQL, Connection, Creation of Database, Table adding Record into it related programs (PO7)

PHP Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**The Building blocks of PHP :** Variables, Data Types, Operators and Expressions, Constants. **Flow Control Functions in PHP:** Switching Flow, Loops, Code Blocks and Browser Output. **Working with Functions:** What is function? ,Calling functions, Functions, Returning the values from User-Defined Functions, Variable Scope.	12
II	**Working with Arrays:** What are Arrays?, Creating Arrays, **Working with Objects** Creating Objects, Object Inheritance, **Working with Strings, Dates and Time-**Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.	12
III	**Working with Forms-**Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, **Working with Cookies and User Sessions-**Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables	14
IV	**Working with Files and Directories:** Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from File, Writing or Appending to a File. **Working with Images -**Understanding the Image-Creation Process, Drawing a New Image ,Modifying Existing Images ,Image Creation from User Input.	12
V	**Interacting with MySQL using PHP -**MySQL versus MySQLi Functions, Connecting to MySQL with PHP ,Working with MySQL Data, **Creating an Online Address Book -**Planning and Creating Database Tables, Creating Menu, Creating Record, Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.	10

Textbooks and References

1. JulieC.Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson education
2. Steven Holzner, PHP: The Complete Reference, McGraw-Hill
3. RobinNixon,LearningPHP,MySQL,JavaScript,CSS&HTML5,ThirdEditionO'reilly,2014
4. XueBaiMichaelEkedahl, The web warrior guide to Web Programming, Thomson (2006).
5. Web resources:
   - e. http://www.codecademy.com/tracks/php
   - f. http://www.w3schools.com/PHP
   - g. http://www.tutorialpoint.com

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COMPUTER SCIENCE	SECCSCP02	2022-23	B.SC(MPCS,MCCS)

SEMESTER – V/VI   **PAPER – VII**   **Max. Marks 50**

Lab List: **Web Applications Development using PHP & MYSQL lab**

No. of Hours per week: 3   **External: 40**   **Internal: 10**   **Credits: 2**

I. Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Learn and implement basic programs in PHP, Control statements and functions concept (PO5)

CO2: Implement Basic programs in Object, various objects, Formatting strings, Date and time (PO5)

CO3: Learn and implement important programs of Forms, Combining HTML with PHP code. Importance of Cookies and Sessions..(PO5)

CO4: Implement programs on Files concept in PHP and on Image creation, drawing, and modification image (P05 & PO7)

CO5: Implement Database programs on MySQLi, Connection, Creation of Database, Table adding Record into it related programs (PO7)

II: Practical (Laboratory) Syllabus: **(30 Periods):** At least 8 Practical's.

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display today's date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in the new PHP page.
9. Write a PHP script to demonstrate passing variables with cookies.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to add, Modify, delete and fetch the rows in a Table.
12. Develop a PHP application to implement the following Operations
    a. Registration of Users.b.Insert the details of the Users.c.Modify the Details.
    d.Transaction Maintenance.

i.No of times Logged in (ii).Time Spent on each login. Ii. Restrict the user for three trials only.

iii. Delete the user if he spent more than 100 Hrs of transaction.

13. Write a PHP script to connect to the MySQL server from your website.
14. Write a program to read customer information like cust-no, cust-name, item purchased, and mob-no, from customer table and display all this information in table format on the output screen.
15. Write a program to edit the name of a customer to "Kiran" with cust-no =1, and to delete record with cust-no=3.
16. Write a program to read employee information like emp-no, emp-name, designation and salary from the EMP table and display all this information using table format in your website.
17. Create a dynamic web site using PHP and MySQL.

Textbooks and References: 1. JulieC.Meloni,SAMS Teach yourself PHP MySQL and Apache, Pearson Education(2007).

1. Steven Holzner, PHP: The Complete Reference, McGraw-Hill

2. RobinNixon,LearningPHP,MySQL,JavaScript,CSS&HTML5,ThirdEditionO'reilly.

Web resources: a.http://www.codecademy.com/tracks/php

b.http://www.w3schools.com/PHP

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Title of the Paper: BIG DATA ANALYTICS USING R

Semester: V/VI

Course Code	SECCAT01	Course Delivery Method	Class Room / Blended Mode – Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2022-23	Year of Offering: 2022-23	Year of Revision: ----	Percentage of Revision: 0%

Course Objective: Big data analytics examines large amounts of data to uncover hidden patterns, correlations and other insights. With today's technology, it's possible to analyze your data and get answers from it almost immediately – an effort that's slower and less efficient with more traditional business intelligence solutions.

Course Outcomes:

CO_1	Understand data and classification of digital data. (PO5)
CO2	Gain knowledge of technologies used in bigdata Analytics. (PO5, PO7)
CO3	Understand basics of R and control structures in R. (PO5)
CO4	Load data into R objects and manipulate them as needed. (PO5)
CO5	Create and edit visualizations with R (PO7)

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Introduction to Big data:** What is data, Classification of Digital Data-Structured Unstructured, semi-structured data, Characteristics of data, Evaluation of big data, Definition and challenges of big data, what is big data and why to use big data?	12
II	**Big data Analytics:** What is and isn't big data analytics? Classification of analytics, Importance of big data analytics, Technologies needed to meet challenges of big data, data science, Data scientist	12
III	**Introduction to R and getting started with R:** What is R? Why R? Advantages of R over other programming languages, Data types in R - logical, numeric, integer, character, double, Complex, raw, coercion, ls () command, Expressions, Variables and functions, control structures, Array, Matrix, Vectors, Factors, R packages	14
IV	**Exploring data in R**– Data frames-data frame access, Ordering data frames, functions for data frames dim(), nrow(), ncol(), str(), summary(), names(), head(), tail(), edit(), Load data frames—reading from .CSV files, Sub setting data frames, reading from tab separated value files, Reading from tables, merging data frames	12
V	**Data Visualization using R**: Reading and getting data into R (External Data),Using CSV files, XML files, Web Data, JSON files, Databases, Excel files, Working with R Charts and Graphs: Histograms, Boxplots, Bar Charts, Line Graphs, Scatter plots, Pie Chart	10

Prescribed Text Book:

1. Seema Acharya--Data Analytics using R, McGraw Hill education (India) Private Limited.

2. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Raj Kamal, PreetiSaxena, McGraw Hill, 2018

Reference Books:

1. SeemaAcharya, SubhashiniChellappan --- Big Data and Analytics second edition, Wiley
2. Big Data, Big Analytics: Emerging Business intelligence and Analytic trends for Today's Business, Michael Minnelli, Michelle Chambers, and AmbigaDhiraj, John Wiley & Sons, 2013
3. An Introduction to R, Notes on R: A Programming Environment for Data Analysis and Graphics. W. N. Venables, D.M. Smith and the R Development Core Team

Course Focus: R for data science focuses on the language's statistical and graphical uses. When you learn R for data science, you'll learn how to use the language to perform statistical analyses and develop data visualizations. R's statistical functions also make it easy to clean, import and analyze data.

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COMPUTER SCIENCE	SECCAP01	2022-23	B.COM (CA)

SEMESTER – V/VI   **PAPER – VI**   **Max. Marks 50**

Title**: BIG Data Analysis using Python lab**

No. of Hours per week: 2   External: 40   Internal: 10   Credits: 2   Pass Marks 20

I. Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Implement simple scripts or programs in R. (PO5)

CO2: Access online resources for R and import new function packages into the R workspace. (PO5, PO7)

CO3: Import, review, manipulate and summarize data-sets in R (PO5, PO7)

CO4: Explore data-sets to create testable hypotheses and identify appropriate statistical tests. (PO5, PO7)

CO5: Create and edit visualizations with R. (PO5, PO7)

II: Practical (Laboratory) Syllabus: (30 Periods)

1. Create a vector in R and perform operations on it (arithmetic operations, combining Vectors, retrieving elements of vector, assign names to vector elements).
2. Create integer, complex, logical, character data type objects in R and print their values And their class using print and class functions.
3. Create a matrix of values in R and extract data from matrix. (Ex. Second row thirdetc.) find transpose of matrix and combine two matrices using Rbind and Cbind   functions.
4. Create a list in R and perform operations on it like list slicing, sum and mean functions, head and tail functions and finally delete list using rm() function.
5. Create data frame in R and perform operations on it
6. Write code in R to find out whether a number is prime or not.
7. Print numbers from 1 to 100 using while loop and for loop in R.
8. Find the factorial of a number using recursion in R.
9. Perform arithmetic operations in R using switch case
10. Write a code in R to find out whether the number is Armstrong or not.
11. Program to find Multiplication table from 1 to 10 number input by user.
12. Import data into R from text and excel files using read.table() and read.csv() function.
13. Create a dataset and draw different types of graphics using plot, box plot, histogram, pair plot functions.
14. Create a dataset and draw different types of graphs using bar charts, pie chart functions.
15. Create custom contingency in R and perform operations on it.

III. Lab References:

1. Seema Acharya--Data Analytics using R, McGraw Hill education (India) Private Limited.

2. Big Data Analytics, Introduction to Hadoop, Spark, and Machine-Learning, Raj kamal, PreetiSaxena, McGraw Hill, 2018

Reference Materials on the Web/web-links:

1. **https://www.wiley.com/enbd/Big+Data,+Big+Analytics:+Emerging+Business+Intelligence+and+Analytic+Trends+for+Today's+Businesses-p-9781118147603**

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Title of the Paper: Data Science using Python

Semester: V/VI

Course Code	SECCAT07	Course Delivery Method	Class Room / Blended Mode – Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2022-23	Year of Offering: 2022 - 23	Year of Revision: ---	Percentage of Revision: 0%

Course Objective: The main objective of the course is to provide students with the basic concepts of Python, its syntax, functions and packages to enable them to write scripts for data manipulation and analysis. The course develops skills of writing and running a code using Python.

Course Outcomes: Students at the successful completion of the course will be able to:

CO₁	Understand the need and importance of data science.(PO5,PO7)
CO₂	Understand basic concepts of python and implementing control structures in python.(PO5)
CO₃	Implement strings and other data structures in python(PO5,PO7)
CO₄	Learn and Implement functions and modules in python.(PO5)
CO₅	Learn and Implement data cleaning and plotting using pandas.(PO5,PO7)

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**INTRODUCTION TODATA SCIENCE** Data science and its importance, Advantages of data science, The process of data science, Responsibilities of a data scientist, Qualifications of data scientists, Would you be a good data scientist?, Why to use python for data science?	12
II	**INTRODUCTION TO PYTHON** What is python?, Features of python, History of python, Writing and executing the python program, Basic syntax, Variables, Keywords, Data types , Operators, Indentation, Control Structures-Conditional statements—If, If-else, Nested if-else, Looping statements—For, While, Nested Loops, Break, Continue, Pass	12
III	**STRINGS AND DATA STRUCTURES** Strings - definition, accessing, slicing and basic operations, Lists - introduction, accessing list, operations, working with lists, functions and methods, Tuples - introduction, accessing tuple, operations, Dictionaries- introduction, accessing values in dictionaries, working with dictionaries.	14
IV	**FUNCTIONSANDMODULES** Functions- Defining a function, Calling a function, Types of functions, Function arguments, Local and global variables, Lambda and recursive functions, Modules---Math, Random, OS, Date and Time	10
V	**PANDAS** What is Pandas?, Series, Data Frame, Read CSV Files, Analyzing Data Frames, Data Correlations, Data Cleaning---Empty cells, Data in wrong format, Wrong data, Duplicates, Pandas Plotting-- plot () method, bar plot, hist plot, box plot, area plot, scatter plot, pie plot	12

Prescribed Books:

1. Steven cooper--- Data Science from Scratch, Kindle edition
2. Reemathareja—Python Programming using problem solving approach, Oxford Publication

Reference Books:

1.Wes McKinney--- Python for Data Analysis ,O'REILLY

AG & SG SIDDHARTHA COLLEGE OF ARTS AND SCIENCES - VUYYURU.
An Autonomous college within the jurisdiction of Krishna University A.P, India.
(With Effect from Academic Year 2022-23)

COMPUTER SCIENCE	SECCAP07	2022-23	B.COM (CA)

SEMESTER – V/VI   **PAPER – VII**   **Max. Marks 50**

Lab List: DATASCIENCE USING PYTHON LAB
No. of Hours per week: 2   **External: 40**   **Internal: 10**   **Credits: 2**

I. Course Outcomes: Students at the successful completion of the course will be able to:
CO1: Implement simple programs in basics of python.(PO5)
CO2: Implement control structures in python.(PO5)
CO3: Implement data structures like strings, list, tuples, dictionaries in python.(PO5,PO7)
CO4:Implementation of data frames, data cleaning and plotting in pandas.(PO5,PO7)

II: Practical (Laboratory) Syllabus: (30 Periods)

1. Python Program to Find the Square Root
2. Python Program to Swap Two Variables
3. Python Program to Generate a Random Number
4. Python Program to check if a Number is odd or Even
5. Python Program to Find the Largest Among Four Numbers
6. Python Program to Check Prime Number
7. Python Program to Display the multiplication Table
8. Python Program to Print the Fibonacci sequence
9. Python Program to Check Armstrong Number
10. Python Program to Find the Sum of Natural Numbers
11. Python Program to Make a Simple Calculator
12. Python Program to Find Factorial of Number Using Recursion
13. Python Program to Add Two Matrices
14. Python Program to Multiply Two Matrices
15. Python Program to Check Whether a String is Palindrome or Not
16. Python Program to perform operations on strings.
17. Python Program to create a list and perform operations on its contents.
18. Python Program to perform operations on tuples.
19. Python Program to create a dictionary and print its content.
20. Python program to import data from CSV file using pandas.
21. Python program to demonstrate plots

III. Lab References:
1. Reemathareja—Python Programming using problem solving approach,Oxford Publication

Reference Materials on the Web/web-links:
 1. https://www.w3schools.com/python/
 2. https://www.geeksforgeeks.org/python-basics/

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Title of the Paper: **Object Oriented Programming Using JAVA**

Semester: IV   **PAPER-IV**

Offered To:	B. Sc. (MPCS.MCCS,MSCS)	Course Code:	CSCT01
Course Type:	Core (Theory)	Course:	Object Oriented Programming using Java
Year of Introduction:	2016 - 2017	Year of offering:	2021 – 2022
Year of Revision:	2021	Percentage of Revision:	15 %
Semester:	IV	Credits:	4
Hours Taught:	60 hrs. per semester	Max. Time:	3 Hrs

Course Prerequisites (if any): Programming Concepts.

Course Description: As the business environment becomes more sophisticated, the software development (software engineering is about managing complexity) is becoming increasingly complex. As of the best programming paradigm which helps to eliminate complexity of large projects, Object Oriented Programming (OOP) has become the predominant technique for writing software in the past decade. Many other important software development techniques are based upon the fundamental ideas captured by object-oriented programming.

Course Objectives:
1. Understand the features of Object Oriented Programming.
2. Understand features of Java programming language.
3. Know how to write and execute java programs in text editors.
4. Apply polymorphism, inheritance, multithreading, exception handling mechanism and packages in real life applications.
5. Write and read data from the files using streams, file handling methods and understand JDBC to perform database operations.

Course Outcomes: At the end of this course, students should be able to:

CO1: Understand the concept and underlying principles of Object-Oriented Programming, Understand how object-oriented concepts are incorporated into the Java programming language. (PO5, PO7).

CO2: Implement Object Oriented Programming Concepts (class, constructor, overloading, inheritance, overriding) in java. (PO5, PO7).

CO3: Analyse inheritance and interfaces in a Java program (PO5, PO7).

CO4: Evaluate Multithreading, exception handling in Java. (PO5, PO7).

CO5: Create applets and packages in a Java program, Use of Input/output Streams in java and use of JDBC with Oracle database. (PO5, PO7).

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	**Fundamentals Of Object – Oriented Programming:** Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP, Java features **Overview Of Java Language:** Introduction, Simple Java program structure, Java tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command line arguments **Constants, Variables & Datatypes:** Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Value to Variables, Scope of variables, Symbolic Constants, Type casting, Getting Value of Variables, Standard Default values **Operators & Expressions**	10
II	**Decision Making & Branching:** Introduction,Decision making with if statement, Simple if statement, If - Else statement, Nesting of if- else statements, The else if ladder, The switch statement, The conditional operator. **Looping:** Introduction, The While statement, The do-while statement, The for statement, Jumps in loops. **Classes, Objects & Methods:** Introduction, Defining a class, Adding variables, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members, Nesting of methods.	12
III	**Inheritance:** Extending a class, Overloading methods, Final variables and methods, Final classes, Abstract methods and classes. **Arrays, Strings:** Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Wrapper classes. **Interfaces:** MULTIPLE INHERITANCE: Introduction, Defining interfaces, Extending interfaces, Implementing interfaces, Assessing interface variables.	12
IV	**Multithreaded Programming:** Introduction, Creating Threads, Extending the Threads, Stopping and Blocking a Thread, Lifecycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the 'Runnable' Interface. **Managing Errors And Exceptions:** Types of errors, Compile-time errors, Run-time errors, Exceptions, Exception handling, Multiple Catch Statements, Using finally statement. **Packages:** Introduction, Java API Packages, Creating Packages, Accessing a Package, Using a Package.	13
V	**Applet Programming:** Local and remote applets, Applets and Applications, Building Applet code, Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state. **Managing Input/Output Files In Java:** Introduction, Concept of Streams, Stream classes, Byte Stream Classes, Character Stream classes: Reader stream classes, Writer Stream classes, Reading and writing files. **Java Database Connectivity:** JDBC introduction, Stages in JDBC Program, Working with Oracle Database: Inserting, Deleting and Updating records.	13

Text Books:
1. Programming with Java, E – Balagurusamy, 3e, TMH.
2. Core Java: An Integrated Approach, Dr. R. Nageswara Rao & KogentLearning Solutions Inc.

Reference Books:
1. Programming with Java, 2ed, John R. Hubbard, Schaum's outline Series, TMH
2. Deitel & Deitel, Java TM : How to program, PHI(2007)

Course Delivery method: Face-to-face / Blended
Course has focus on: Employability
Websites of Interest:
[1].https://www.javatpoint.com/java-tutorial
[2].https://www.w3schools.com/java/
[3].https://www.tutorialspoint.com/jdbc/index.htm

Co-curricular Activities : Programming Contests, Assignments & Quiz.

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Title: Object Oriented Programming Using JAVA Lab

SEMESTER-IV   **PAPER-IV**

Offered To:	B. Sc. (MPCS,MCCS,MSCS)	**Course Code:**	CSCP01
Course Type:	Core (Practical)	**Course:**	Object Oriented Programming using Java Lab
Year of Introduction:	2016 – 2017	**Year of offering:**	2021 – 2022
Year of Revision:	2021	**Percentage of Revision:**	15%
Semester:	IV	**Credits:**	1
Hours Taught:	30 hrs. per semester	**Max. Time:**	3 Hrs

Course Prerequisites (if any): Knowledge in OOP & Java concepts, Programming Fundamentals

Course Objective:
To enable students to implement various OOP concepts using Java programming language and also educating students in accessing databases using JDBC connectivity.

Course Outcomes: At the end of this course, students should be able to:
CO1: Implementing class, constructor, method overloading, method overriding in java.
      (PO5, PO7)
CO2: Implement different types of inheritance and interfaces in a Java program .(PO5, PO7)
CO3: Implement Multithreading, exception handling mechanisms in Java. (PO5, PO7)
CO4: Implement Applets and JDBC connectivity. (PO5, PO7)

Java Lab list

1. Write a program to use command line arguments.
2. Write a program to demonstrate that include a method inside the Rectangular Class.
3. Write a program to demonstrate Parameterized Constructors.
4. Write a program to demonstrate Method Overloading.
5. Write a Program to demonstrate Constructor Overloading.
6. Write a program to demonstrate Method Inheritance.
7. Write a program to demonstrate Method Overriding.
8. Write a program to demonstrate Abstract Classes.
9. Write a program to arrange given Strings in Alphabetical Order.
10. Write a program for implementing interfaces.
11. Write a program on Multiple Inheritance.
12. Write a program to demonstrate the Creating threads using thread class.
13. Write a program to demonstrate using thread methods.
14. Write a program to Implement Thread Priority.
15. Write a program to demonstrate Catch Blocks.
16. Write a program to Import Packages.
17. Write a program to demonstrate Applet Program.
18. Write a program to create table and insert values into table in a database.
19. Write a program to delete values in a table in database.
20. Write a program to update values in a table in database.

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OPERATING SYSTEMS

Semester: IV   **PAPER-V**

Offered To:	B. Sc. (MPCS, MCCS, MSCS)	**Course Code:**	CSCT41C
Course Type:	Core (Theory)	**Course:**	Operating systems
Year of Introduction:	2021 – 2022	**Year of offering:**	2021 – 2022
Year of Revision:	-	**Percentage of Revision:**	-
Semester:	IV	**Credits:**	4
Hours Taught:	60 hrs. per semester	**Max. Time:**	3 Hrs

Course Prerequisites (if any): Basic Knowledge in computers, data structures and C programming language.

Course Description:
This course provides basic knowledge about operating system functions, its architectural design along with implementation of various scheduling algorithms. This course also provides knowledge in handling deadlock situation.

Course Objectives:
The Purpose of this course is to give students an idea of the services provided by the operating system, structure,organization of the file system, process synchronizations, scheduling and memory management.

Course Outcomes: At the end of this course, students should be able to
1**. Understand** Operating System Architectural design and its services. (PO5, PO6, PO7)
2. **Implementation** of Scheduling Algorithms. (PO5, PO6, PO7)
3. **Analyze** memory management techniques, concepts of virtual memory and disk scheduling. (PO5, PO6, PO7)
4. **Understand** the implementation of file systems and directories with the interfacing of IO devices with the operating system. (PO5, PO6, PO7)
5. **Identify** the deadlock situation and provide appropriate solutions so that protection and security of the operating system is also maintained. (PO5, PO6, PO7)

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	**Operating System**: Introduction, Operating Systems Objectives and functions, Computer System Architecture, OS Structure, OS Operations. Evolution of Operating Systems , Types of operating system - Simple, Batch, Multi programmed , Time shared , Parallel, Distributed Systems, Real-Time Systems, Operating System services.	11
II	**Process and CPU Scheduling** – Process concepts , The Process, Process State, Process Control Block, Process communication, Threads. Process Scheduling - Scheduling Queues, Schedulers, Context Switch, Preemptive Scheduling,Dispatcher, , Scheduling Criteria, Scheduling algorithms,Case studies: Linux, Windows. Process Synchronization - The Critical section Problem, Synchronization Hardware,Semaphores, Classic Problems of Synchronization,Monitors.	13
III	**Memory Management and Virtual Memory** – Logical & physical Address Space, Swapping, Contiguous Allocation , Paging-Structure of Page Table, Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demanding Paging, Page Replacement , Page Replacement Algorithms, Allocation of Frames.	13
IV	**File System Interface** – The Concept of a File , Access methods , Directory Structure, ,File System Mounting , File Sharing, Protection, File System Structure, Mass Storage Structure - Overview of Mass Storage Structure , Disk Structure, Disk Attachment, Disk Scheduling.	12
V	**Deadlocks** – System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention,Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.	11

PrescribedTextBooks			
	Author	**Title**	**Publisher**
1	Silberschatz, Galvin, Gagne	Operating System Concepts, eight Edition	John Willey & Sons INC

ReferenceTextBook			
	Author	**Title**	**Publisher**
1	Abraham Silberchatz, Peter B. Galvin, Greg Gagne	Operating System Principles, 8th Edition	Wiley Student Edition
2	Naresh Chauhan,	Principles of Operating Systems	OXFORD University Press

Course Delivery method : Face-to-face / Blended

Course has focus on : Skill Development

Co-curricular Activities: Programming Contests, Assignments & Quiz

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OPERATING SYSTEMS LAB

Semester: IV   **PAPER-V**

Offered To:	B. Sc. (MPCS, MCCS, MSCS)	**Course Code:**	**CSCP41C**
Course Type:	Core (Practical)	**Course:**	Operating systems Lab
Year of Introduction:	2021 – 2022	**Year of offering:**	2021 – 2022
Year of Revision:	-	**Percentage of Revision:**	-
Semester:	IV	**Credits:**	1
Hours Taught:	30 hrs. per semester	**Max. Time:**	3 Hrs

Course Prerequisites (if any): Basic Knowledge in OS concepts, data structures and C programming language.

Course Description:
This course deals with training students in developing and implementing logics for various OS scheduling algorithms. It also enables students to gain practical knowledge in implementing various UNIX commands.

Course Objective:
The Purpose of this course is to have students understand and the principles in the design and implementation of operating system software.

Course Outcomes: At the end of this course, students should be able to

CO 1. Implementing DOS & UNIX Commands(PO5, PO6, PO7)
CO 2. Implementing CPU Scheduling Algorithms(PO5, PO6, PO7)
CO 3. Implementing CPU Scheduling Algorithms, Deadlocks Avoidance, Prevention & Memory
       Management Techniques(PO5, PO6, PO7)
CO 4. Implementing Contiguous Memory Allocation Techniques & Page Replacement Algorithms(PO5, PO6, PO7)
CO 5. Implementing File allocation Strategies(PO5, PO6, PO7)

Lab Exercises

1. **DOS** - Internal Commands

2. UNIX Commands
   1. In your home directory create a directory named DIR
   2. Copy all files whose filenames satisfy the following conditions to ~/DIR. The files are in /usr/include directory, their names start with m, end with .h and contain a number.
   3. Create a subdirectory called SUBDIR in your DIR directory.
   4. The first five lines of each file you have copied from /usr/include copy to file ~/DIR/ SUBDIR/first five.
   5. The last lines of files in ~/DIR copy to file ~/DIR/SUBDIR/last.
   6. Concatenate the two files in ~/DIR/SUBDIR into one file ~/DIR/SUBDIR/first and last
   7. Delete the files in ~/DIR/SUBDIR except first and last.
   8. Store the number of files and directories in ~/DIR into a file ~/DIR/SUBDIR/count
   9. Output the long information in the ~/DIR/SUBDIR directory. (Not its content, but information on it).
   10. Delete the contents of ~/DIR/SUBDIR/first and last file without removing the file itself.
   11. Add a line containing just a star sign (i.e. *) to file ~/DIR/SUBDIR/first and last.
   12. Delete ~/DIR together with all the files it contains.
   13. Output lines number 11-20 from file /etc/passwd.

3. List of Programmes

1. Write a Program to implement First Come First Serve Scheduling algorithm
2. Write a Program to implement Shortest Job First Scheduling algorithm
3. Write a Program to implement Round Robin Scheduling algorithm
4. Write a Program to implement Priority Scheduling algorithm
5. Write a program to implement Worst Fit Contiguous Memory Allocation
6. Write a program to implement Best Fit Contiguous Memory Allocation
7. Write a program to implement First Fit Contiguous Memory Allocation
8. Write a program to implement First In First Out Page replacement Algorithm
9. Write a program to implement First In Least Recently Used Page replacement Algorithm
10. Write a program to implement First In Optimal Page replacement Algorithm

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DATABASE MANAGEMENT SYSTEMS

SEMESTER-IV   **PAPER-IV**

Offered To:	B. Com (CA)	Course Code:	CABT41A
Course Type:	Core (Theory)	Course:	Database Management Systems
Year of Introduction:	2021 – 2022	Year of offering:	2021 – 2022
Year of Revision:	-	Percentage of Revision:	-
Semester:	IV	Credits:	4
Hours Taught:	60 hrs. per semester	Max. Time:	3 Hrs

Course Prerequisites (if any):

Course Description: This course focuses towards Database System Concepts and Architecture, ER models, relational algebra relational calculus, SQL and PL/SQL.

Course Objectives:

The objective of the course is to introduce the design and development of databases with special emphasis on relational databases. Design & develop database for large volumes & varieties of data with optimized data processing techniques.

Course Outcomes: At the end of this course, students should be able to:

On completing the subject, students will be able to:

CO1	Understand the Characteristics and basics of Database.(PO5, PO7)
CO2	Understand file system and Architecture of DBMS(PO5, PO7)
CO3	Enlighten ER Diagrams, Relationship, Notation & schema. (PO5, PO7)
CO4	Enlighten EER Diagrams & Applying constraints on data. (PO5, PO7)
CO5	Implementing SQL commands retrieve, insert, modify and update(PO5, PO7)

	Syllabus	
Unit	**Learning Units**	**Lecture Hours**
I	**Databases and Database Users :** Introduction - Data and Information, Characteristics of the Database Approach, Self-Describing Nature of the Database System, Insulation between Programs and Data, Data Abstraction, Support of Multiple Views of the data, Sharing of Data and multiuser Transaction Processing, Evolution of Database System	10
II	Traditional File Processing Systems - Disadvantages of Traditional File Processing Systems, Advantages of the Database Approach, Database system Concepts and Architecture - Data Models, Schemas and Instances, Categories of Data Models, Schemas, Instances and Database State, Three-Schema architecture for database development, Data Independence	10
III	Entity Relationship Model – Introduction, Entity types, Entity sets, Attributes and Keys, Entities and Attributes, Entity Types, Entity Sets, Keys and Value Sets, Relationships, Relationship types, Roles, and Structural Constraints – Relational types, Sets and Instances, Relationship degree, Role names, recursive relationships, constraints on relationship types, Attributes of relationship types. Weak entity types, E R diagrams, Naming conventions, design issues - Summary of Notation for ER Diagrams, Proper Naming of Schema Constructs.	12

IV	Enhanced Entity-Relationship - Subclasses, super classes, and inheritance, Specialization and Generalization, Constraints and characteristics of Specialization and Generalization, Data Abstraction and knowledge representation concepts - Classification and Instantiation, Identification, Aggregation and Association. The Relational Data Model, Relational Constraints - Introduction, Relational Model Concepts, Domains, Attributes, Tuples and Relations , Relational Model Notation, Relational Constraints and Relational Database Schemas, Entity Integrity, Referential , Integrity and Foreign Keys.	13
V	SQL (STRUCTURED QUERY LANGUAGE) Introduction, Data Definition, Constraints and Schema changes in SQL - Schema AND Catalog Concepts in SQL, The CREATE TABLE Command and SQL Data Types and Constraints, The DROP SCHEMA and DROP TABLE Command, The ALTER TABLE Command, Basic Queries in SQL - The SELECT-FROM-WHERE Structure of SQL Queries, Dealing with Ambiguous Attribute Names and Naming (Aliasing), Unspecified WHERE-Clause and Use of Asterisk (*), Tables as sets in SQL, Substring Comparisons, Arithmetic Operators, and Ordering. Aggregate Functions and Grouping 5.5, Insert, Delete, and Update Statements in SQL - The INSERT Command, The DELETE Command, The Update Command.	15

PrescribedTextBook:

	Author	Title	Publisher
1	R.Elmasri and S.Navathe	Fundamentals of Database Systems	
2	Jeffrey A.Hoffer,V.Ramesh, HeikkiTopi	Modern Database Management	Pearson
3	Abraham Silberschatz, Henry Korth, and S. Sudarshan	Database System Concepts	McGrawhill, 2010

ReferenceTextBooks:

	Author	Title	Publisher
1	Raghu Ramakrishnan	Database Management Systems	McGrawhill,2002
2	J .D.Ullman	Prinicples of Database Systems	
3	Bipin C Desai	An Introduction to Database Systems	
4	.Sumathi, S. Esakkirajan	Fundamentals of Relational Database Management Systems	Springer Publications

Course Delivery method: Face-to-face / Blended

Course has focus on: Skill Development

Websites of Interest:

Co-curricular Activities: Certification Courses, Seminars, Quiz.

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DATABASE MANAGEMENT SYSTEMS LAB

Semester: IV   **PAPER-IV**

Offered To:	B. Com (CA)	**Course Code:**	CABP41A
Course Type:	Core (LAB)	**Course:**	Database Management Systems Lab
Year of Introduction:	2021 – 2022	**Year of offering:**	2021 – 2022
Year of Revision:	-	**Percentage of Revision:**	-
Semester:	IV	**Credits:**	1
Hours Taught:	30 hrs. per semester	**Max. Time:**	3 Hrs

Course Prerequisites (if any): A good background in DBMS fundamentals is required. Students should be comfortable with the relational model, SQL, and the basic functions of database systems.

Course Objective:

The major objective of this lab is to provide a strong formal foundation in database concepts, technology and practice to the participants to groom them into well-informed database application developers.

Course Outcomes:

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to
CO1	Construct queries using SQL in database creation. (PO5, PO7)
CO2	Construct queries using SQL in database based on criterion. (PO5, PO7)
CO3	Implement Enforce integrity Constraints in SQL. (PO5, PO7)
CO4	Implementing Aggregate functions in SQL(PO5, PO7)
CO5	Implementing query in database using sql DDL/DML Commands(PO5, PO7)

Lab List

1. Create a Department table with the following fields: DEPTNO, DNAME and LOCATION.
2. Describe the structure of „DEPT" table.
3. Insert values into "DEPT" table.
4. Select all values from „DEPT" table.
5. Create EMPLOYEE table with the following fields: EMPNO, ENAME, JOB, MGR, HIRE DATE, SALARY, COMMISTION and DEPTNO.
6. Describe the structure of „EMP" table.
7. Insert the values into „EMP" table.
8. Select all the values from „EMP" table.
9. Create table GRADE with the following fields: GRADE, LOSAL and HISAL.
10. Insert values into „GRADE" table.
11. Select all the values from „GRADE" table.
12. List all the employee information for department 10.

13. Find out the names of all employees.
14. Retrieve the list of names and salary of all employees.
15. Find the names of employees who have a salary equal to RS3000.
16. List the employee whose names start with "s".
17. List the employee names ending with „s".
18. List the names of employees whose names have exactly 5 characters.
19. List the employee names having D as the second character.
20. List the employee names having two A"S in their name.
21. Display all employee names which have „TH" or „LL" in them.
22. List out EMPNO, ENAME and SALARY of the employees whose salary is between 1500 and 2000.
23. List the names of employees who belong to department 10, 20.
24. List employee number of the employees who don"t have the name of „FORD", "JAMES" (OR)"JONES".
25. Display all the different job types.
26. Retrieve all rows from EMP table for department 30 and order by name.
27. List the employee names and HIREDATES in descending order of HIREDATE.
28. Retrieve department names and no"s in ascending order of DNAME.
29. List all employees" information that has a manager.
30. List name of the employees, job and commission of those employees who do the job of clerk or salesman and get no commission.
31. List the names and jobs of all clerks in department 20.
32. Display current data & time.
33. Display the concatenated string.
34. Display string „SMITH" of first character as capital letter.
35. Display the length of a string „SALESMAN".
36. Display the string „SALESMAN" in lower case.
37. Display all department names in upper case.
38. Display the value using ABS.
39. Displays the value using CEIL.
40. Display the value using FLOOR.
41. Display the value using POWER.
42. Display the value using SQRT.
43. Display all employees who were hired during 1982.
44. List the no of employees working with company.
45. List the no of jobs available in the emp table.
46. List the total salaries payable to employees.
47. List the maximum salary of employee working as a salesman.
48. List the minimum salary of employee from employee table.
49. List the avg salary from Employee table.
50. List the avg salary and no of employees working in the deptno 20.
51. Display the total salary for each department.
52. List the average salary of each job in the EMP table.
53. List the maximum salary for each department.
54. Find the total salary for each job of each department.
55. Display the no of employee in each department.
56. To find the maximum salary of each department, but show only the department that has a maximum salary of more than RS 2900.
57. List the total salary, maximum, minimum and average salary of employees job wise for department no and display only those rows having average salary greater than 1000.

58. Display the job tittle and total monthly salary for each job title with a total pay role exceeding RS 5000 and excludes sales people and sorts the list by the total monthly salary.
59. Display the different job in department 20 and 30.
60. List the employee no and names working in department no 20 and 30.
61. Display the different jobs in department 20 and 30 with union all.
62. Display all the employee names dept no"s and dept names.
63. Display all employees in „DALLAS".
64. Display the employee names where salary is greater than employee no 7566.
65. Display the employee whose job tittle is same as that of employee 7369.
66. Display the employee name where salary is equal to the minimum salary.
67. Find the employees who earn the same salary as the minimum salary for departments.
68. To display all the departments that has a minimum salary greater than that of department 20.

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NAAC reaccredited at 'A' level
Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: <mark>OBJECT ORIENTED PROGRAMMING USING JAVA</mark>
Semester: IV   **PAPER-V**

Course Code	**CCSCT42**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	25
No. of Lecture Hours / Week	5	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2020-21	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Course Objective: This Course will enable students to understand the basic concepts of object oriented programming and difference between procedure-oriented programming; get a clear understanding of basics of java programming

Course Outcomes:

CO$_1$	Able to Understand the concept and underlying principles of Object-Oriented Programming.
CO$_2$	Able to Understand the Basic concepts of Data types & Operators
CO$_3$	Able to Implement Decision & Looping Statements
CO$_4$	Able to Implement Object Oriented Programming Concepts like class, constructor, overloading in java.
CO$_5$	Able to Understand the concept of Inheritance and Exceptions Object-Oriented Programming.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Fundamentals of Object – Oriented Programming:** Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP, Java features:	10
II	**Overview of Java Language**: Introduction, Simple Java program structure, Java tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command line arguments. **Constants, Variables & Data Types:** Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Value to Variables, Scope of variables, Type casting, Getting Value of Variables, **Operators.**	14
III	**Decision Making & Branching:** Introduction, Decision making with if statement, Simple if statement, if-Else statement, Nesting of if-else statements, the else if ladder, the switch statement, the conditional operator. **Looping**: Introduction, while statement, do-while statement, for statement, Jumps in loops.	12
IV	**Classes, Objects & Methods**: Introduction, defining a class, adding variables, adding methods, creating objects, Accessing class members, Constructors, Method overloading, Method Overriding, Static members, Nesting of methods;	12
V	**Inheritance**: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Abstract Methods and Classes; **Arrays, Strings And Vectors:** Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Vectors, Wrapper classes; **Interfaces**: **Multiple Inheritance**: Introduction, Defining interfaces, Extending interfaces, Implementing interfaces, Assessing interface variables;	12

Prescribed Text Book:
1. E. Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.
Reference Books
1. Programming In Java By Sachin Malhotra And Saurabh Choudhary From Oxford University Press
2. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press
3. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series,
4. Deitel&Deitel. Java TM: How to Program, PHI (2007)
5. Java Programming: From Problem Analysis to Program Design- D.S Mallik

Course Focus: OOP focus on the objects that developers want to manipulate rather than the logic required to manipulate them.

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(**With Effect from Academic Year 2020-21**)

COMPUTER SCIENCE	CCSCP42	2022-23	B. Com (CA)

SEMESTER – IV   **PAPER – V**

Lab List: **OBJECT ORIENTED PROGRAMMING USING JAVA** **Pass Marks**

No. of Hours per week: 2   **External: 40**   **Internal: 10**   **Credits: 1**

1. Write a program to perform various String Operations
2. Write a program to print the given number is Armstrong or not?
3. Prompt for the cost and selling price of an article and display the profit (or) loss
4. Write a program to print the numbers given by command line arguments
5. Write a program on class and object in java
6. Illustrate the method overriding in JAVA
7. Write a program to find the Simple Interest using Multilevel Inheritance
8. Write a program to display matrix multiplication.
9. Write a program on interface in java
10. Write a program on inheritance

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Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: <mark>OBJECT ORIENTED PROGRAMMING USING JAVA</mark>
<mark>Semester: IV</mark>   **PAPER-V**

Course Code	**ECCSCT41**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	25
No. of Lecture Hours / Week	5	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2020-21	Year of Offering: 2022 - 23	Year of Revision: ----	Percentage of Revision: 0%

Course Objective: This Course will enable students to understand the basic concepts of object oriented programming and difference between procedure-oriented programming; get a clear understanding of basics of java programming

Course Outcomes:

CO_1	Able to Understand the concept and underlying principles of Object-Oriented Programming.
CO_2	Able to Understand the Basic concepts of Data types & Operators
CO_3	Able to Implement Decision & Looping Statements
CO_4	Able to Implement Object Oriented Programming Concepts like class, constructor, overloading in java.
CO_5	Able to Understand the concept of Inheritance and Exceptions Object-Oriented Programming.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Fundamentals of Object – Oriented Programming:** Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP, Java features:	10
II	**Overview of Java Language**: Introduction, Simple Java program structure, Java tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command line arguments. **Constants, Variables & Data Types:** Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Value to Variables, Scope of variables, Type casting, Getting Value of Variables, **Operators.**	14
III	**Decision Making & Branching:** Introduction, Decision making with if statement, Simple if statement, if-Else statement, Nesting of if-else statements, the else if ladder, the switch statement, the conditional operator. **Looping**: Introduction, while statement, do-while statement, for statement, Jumps in loops.	12
IV	**Classes, Objects & Methods**: Introduction, defining a class, adding variables, adding methods, creating objects, Accessing class members, Constructors, Method overloading, Method Overriding, Static members, Nesting of methods;	12
V	**Inheritance**: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Abstract Methods and Classes; **Arrays, Strings And Vectors:** Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Vectors, Wrapper classes; **Interfaces**: **Multiple Inheritance**: Introduction, Defining interfaces, Extending interfaces, Implementing interfaces, Assessing interface variables;	12

Prescribed Text Book:
1. E. Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.
Reference Books
6. Programming In Java By Sachin Malhotra And Saurabh Choudhary From Oxford University Press
7. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press
8. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series,
9. Deitel&Deitel. Java TM: How to Program, PHI (2007)
10. Java Programming: From Problem Analysis to Program Design- D.S Mallik

Course Focus: OOP focus on the objects that developers want to manipulate rather than the logic required to manipulate them.

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(With Effect from Academic Year2020-21)

COMPUTER SCIENCE	ECCSCP41	2022-23	B. Com (e-Com-Computers)

SEMESTER – IV   **PAPER – V**

Lab List: OBJECT ORIENTED PROGRAMMING USING JAVA   Pass Marks 20

No. of Hours per week: 2   External: 40   Internal: 10   Credits: 1

1. Write a program to perform various String Operations

2. Write a program to print the given number is Armstrong or not?

3. Prompt for the cost and selling price of an article and display the profit (or) loss

4. Write a program to print the numbers given by command line arguments

5. Write a program on class and object in java

6. Illustrate the method overriding in JAVA

7. Write a program to find the Simple Interest using Multilevel Inheritance

8. Write a program to display matrix multiplication.

9. Write a program on interface in java

10. Write a program on inheritance

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(With Effect from Academic Year 2021-22)

COMPUTER SCIENCE	ECCSCT42	2022-'23	B.Com.(E-Commerce)

SEMESTER – IV   PAPER – VI   Max. Marks: 75

<u>**Syllabus**</u>   DATA BASE MANAGEMENT SYSTEMS

NO Of Hours: 5   No Of Credits: 3   Pass Marks: 30

Course Objective: Design & develop database for large volumes & varieties of data with optimized data

processing techniques.

Course Prerequisites (if any):
Course Description: This course focuses towards Database System Concepts and Architecture, ER models, relational algebra relational calculus, SQL and PL/SQL.
Course Objectives:
The objective of the course is to introduce the design and development of databases with special emphasis on relational databases. Design & develop database for large volumes & varieties of data with optimized data processing techniques.
Course Outcomes: At the end of this course, students should be able to:
On completing the subject, students will be able to:

CO1	Understand the Characteristics and basics of Database.(PO5, PO7)
CO2	Understand file system and Architecture of DBMS(PO5, PO7)
CO3	Enlighten ER Diagrams, Relationship, Notation & schema. (PO5, PO7)
CO4	Enlighten EER Diagrams & Applying constraints on data. (PO5, PO7)
CO5	Implementing SQL commands retrieve, insert, modify and update(PO5, PO7)

Unit – 1: Database Systems Introduction **12Hrs**
Database Systems: Introducing the database and DBMS, Why the database is important,
Historical Roots: Files and File Systems, Problems with File System, Data Management, Database Systems.
Data Models: The importance of Data models, Data Model Basic Building Blocks, The evaluation of Data Models.
Unit - II: Relational Database & Data Modelling **12 Hrs**
The Relational Database Model: A logical view of Data, Keys, Integrity Rules, Relational Set Operators, Indexes, Codd's relational database rules.*Entity Relationship Model:* The ER Model
Advanced Data Modelling: The Extended Entity Relationship Model, Entity clustering.
Unit-III: Normalization and Database Design **14 Hrs**
Normalization of database tables: Database Tables and Normalization, The need for Normalization, The Normalization Process, High level Normal Forms, Normalization and database design, de normalization.
Unit-IV: Structured Query Language **12 Hrs**
Introduction to SQL: Data Definition Commands, Data Manipulation Commands, Select queries, Advanced Data Definition Commands, Advanced Select queries, Virtual Tables, SQL Join Operators,
Unit-V: Procedural SQL **10 Hrs**
Introduction to PL/SQL : Triggers, Stored Procedures, Pl/ SQL Stored Functions
Prescribed Text Book:
1. **Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, Seventh Edition, Thomson (2007).**
Reference Books:
1. Elimasri / Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Addison Wesley
2. Raman A Mata – Toledo/Panline K Cushman, Database Management Systems, Schaum'sOutlibe series, Tata McGraw Hill (2007).

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COMPUTER SCIENCE	ECCSCP42	2022-23	B. Com (e-Com-Computers)

SEMESTER – IV   **PAPER – VI**

Lab List: <mark>DATA BASE MANAGEMENT SYSTEM</mark>   **Pass Marks 20**

No. of Hours per week: 2   External: 40   Internal: 10   Credits: 1

1. Creation of college database and establish relationships between tables
2. Show the structure of the Student table.
3. Show the structure of the Emp table.
4. Show the structure of the DEPT table.

Queries
1. Explain the syntax of SELECT statement.
2. Create a query to display the name, job, hiredate and employee number from emp table.
3. Create a query to display unique jobs from the emp table.
4. Create a query to display the empno as EMP#, ename as EMPLOYEE and Hire_date from emp.
5. Create a query to display all the data from the EMP table. Separate each column by a comma and
6. name the column THE_OUTPUT.
7. Create a query to display the name and salary of employees earning more than 2850.
8. Create a query to display the name and salary for all employees whose salary is not in the range of
9. 1500 and 2850.
10. Display the employee name, job and start date of employees hired between February 20 ,1981
11. and May 1, 1981. Order the query in ascending order of start date
12. Display the employee name and department number of all the employees in departments 10 and 30
13. in alphabetical order by name.
14. List the name and salary of employees who earn more than 1500 & are in department 10 or 30.
15. Display the name, salary and commissions and sort data in descending order of salary and
16. commission.
17. Display the name and job title of all employees who do not have a manager.
18. Display the name, job and salary for all employees whose job is Clerk or Analyst and their salary
19. is not equal to 1000, 3000 or 5000.
20. Display the names of all employees where the third letter of their name is an 'A'.
21. Display the names of all employees who have two 'L's in their name and are in department 30 or
22. their manager is 7782.
23. Display the name , salary and commission for all employees whose commission amount is grater
24. than their salary increased by 10%.

21. Explain all the character functions.
22. Explain all the number functions.
23. Explain all the Date functions.

PL/SQL.
1. Write A Pl/Sql Program To Swap Two Numbers Without Using Third Variable.
2. Write A Pl/Sql Program To Generate Multiplication Tables For Numbers 2,4 And 6
3. Write A Pl/Sql Program To Display Sum Of Even Numbers And Sum Of Odd Numbers In The Given Range.
4. Write A Pl/Sql Program To Check The Given Number Is Pollinndrome Or Not.
5. Write A Pl/Sql Program To Display Top 10 Rows In Emp Table Based On Their Job And Salary.

Reference Books:
1. Oracle Pl/Sql By Example. Benjamin Rosenzweig, Elena Silvestrova, Pearsoneducation 3rd Edition
2. Sql& Pl/Sql For Oracle 10g, Black Book, Dr.P.S. Deshpande

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Title of the Paper: Data Structures

Semester: II   **PAPER-II**

Course Code	CSCT21B	Course Delivery Method	Class Room / Blended Mode – Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2020-21	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of various data structures in developing and implementing efficient algorithms.

Course Outcomes:

COURSE OUTCOME NO	Upon successful completion of the course, student will be able to:	PROGRAM OUTCOME NO
CO1	Learn the concepts of ADT and understand analysis of algorithms	PO1, PSO1, PSO2, PSO4
CO2	Understand available Data Structures for data storage and processing.	PO1, PSO1, PSO2, PSO4
CO3	Learn stacks, queues and their applications	PO1, PSO1, PSO2, PSO4
CO4	Understand trees, graphs and implement their operations	PO1, PO7, PSO1, PSO2, PSO4
CO5	Develop ability to implement different Sorting and Search methods	PO1, PO7, PSO1, PSO2, PSO4

Syllabus

UNIT – I: 11Periods

Introduction to Data Structures: Introduction to the Theory of Data Structures, Data Representation, Abstract Data Types, Data Types, Primitive Data Types, Data Structure and Structured Type, Atomic Type, Difference between Abstract Data Types, Data Types, and Data Structures, Refinement Stages.

Principles of Programming and Analysis of Algorithms: Software Engineering, Program Design, Algorithms, Different Approaches to Designing an Algorithm, Complexity, Big 'O' Notation, Algorithm Analysis, Recursion.

UNIT – II: 11Periods

Linked Lists: Introduction to Lists and Linked Lists, Basic Linked List Operations, Doubly Linked List, Circular Linked List, Atomic Linked List, Linked List in Arrays, Linked List versus Arrays

UNIT – III: 14Periods

Stacks: Introduction to Stacks, Stack as an Abstract Data Type, Representation of Stacks through Arrays, Representation of Stacks through Linked Lists, Applications of Stacks, Stacks and Recursion

Queues: Introduction, Queue as an Abstract data Type, Representation of Queues, Circular Queues, Double Ended Queues- De-ques, Priority Queues, Application of Queues

UNIT – IV: 10Periods

Binary Trees: Introduction to Non- Linear Data Structures, Introduction Binary Trees, Types of Trees, Basic Definition of Binary Trees, Properties of Binary Trees, Representation of Binary Trees, Operations on a Binary Search Tree, Binary Tree Traversal, Counting Number of nodes in Binary Trees, Applications of Binary Tree

UNIT – V: 14Periods

Searching and sorting: Sorting – An Introduction, Bubble Sort, Insertion Sort, Merge Sort, searching – An Introduction, Linear or Sequential Search, Binary Search, Indexed Sequential Search

Graphs: Introduction to Graphs, Terms Associated with Graphs, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs, Spanning Trees, Shortest Path, Application of Graphs.

BOOKS:

- "Data Structures using C", ISRD group Second Edition,TMH
- Data Structures through C", YashavantKanetkar, BPBPublications
- "Data Structures Using C" Balagurusamy E.TMH

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual andchallenging)

2. Student seminars (on topics of the syllabus and related aspects (individualactivity))

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups asteams))

4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. GroupDiscussion
2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports.
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborativework.

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PAPER-II

Semester II	Course Code	Course Title	Hours	Credits
BSC(MPCS/MCCS/MSCS)	CSCP21B	Data Structures Lab	30	1

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to:	PROGRAM OUTCOME NO
CO1	implement stacks, queues using arrays and linked lists.	PO1, PSO1, PSO2, PSO4
CO2	Write program for conversion from infix to postfix.	PO1, PSO1, PSO2, PSO4
CO3	implement different sorting and searching techniques.	PO 7, PSO1, PSO2, PSO4
CO4	Construct binary trees and binary search trees.	PO 1, PSO1, PSO2, PSO4
CO5	implement binary tree and Graph traversals.	PO1,PO 7, PSO1, PSO2, PSO4

Lab Experiments List

Cycle - I

Week 1: Write a program to read 'N' numbers of elements into an array and also perform the following operation on an array

- Add an element at the beginning of an array

- Insert an element at given index of array

- Update a element using a values and index

- Delete an existing element

Week 2: Write Program to implement the Stack operations using an array.

Week 3: Write a program using stacks to convert a given infix expression to postfix.

Week 4: Write a program for arithmetic expression evaluation.
Week 5: Write Program to implement the Stack operations using Liked List.

Week 6: Write Program to implement the Queue operations using an array.

Week 7: Write Program to implement the Queue operations using Liked List.

Week 8: Write Program to implement circular Queue operations using an array.

Cycle - II

Week 9: Write a program to implement de-queues.

Week 10: Write a program to implement single linked list.

Week 11: Write a program to implement double linked list.

Week 12: Write a program for Binary Search Tree Traversals.

Week 13: Write a program to search an item in a given list using the following Searching Algorithms
- Linear Search
- Binary Search.

Week 14: Write a program for implementation of the following Sorting Algorithms
- Bubble Sort
- Insertion Sort
- Merge sort

Week 15: Write a program for implementation of the following graph traversals.
- BFS
- DFS

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Title of the Paper: **E–COMMERCE & WEB DESIGNING**

Semester: II   PAPER-II

Course Code	**CABT21A**	Course Delivery Method	Class Room / Blended Mode – Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2020-21	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

COURSE OBJECTIVES:
The main objective of the course is to impart conceptual understanding on business transactions on worldwide web And electronic commerce & Electronic Customer Relationship Management and Web designing concepts for Providing quality content on website.

COURSE OUTCOMES:

COURSE OUTCOME NO	on successful completion of this course, students should have the knowledge and skills to
CO1	in knowledge in E- commerce and its business models
CO2	fferentiate traditional and e – marketing and also gain knowledge in E-CRM and EPS
CO3	derstand the structure of HTML its basic tags
CO4	plement various HTML tags for web page development
CO5	derstand about web page designing

Syllabus

UNIT I: An Overview on E-Commerce   **(10periods)**

1.1 Introduction E-Commerce
1.1.1   Definition of E- Commerce and its advantages & disadvantages
1.1.2   Electronic Data Interchange (EDI)
1.1.3   E-Commerce transactional issues and challenges
1.1.4   Difference between Commerce and E-Commerce

1.2 Business Models for Ecommerce
1.2.1   B2C -Business to consumer.
1.2.2   B2B – Business to business
1.2.3   C2B – Consumer to business.
1.2.4   C2C – Consumer to consumer.

UNIT II: E-Marketing &E – CRM& Electronic Payment Systems   **(10periods)**

2.1 Online Marketing
2.1.1   Traditional Vs. E-Marketing
2.1.2   Online Marketing
2.1.3   E-Advertising
2.1.4   Internet marketing

2.2 E – CRM
2.2.1   Definition of CRM and E-CRM and its Applications
2.2.2 E- CRM Architectural components
2.2.3 Definition & characteristics of E- SCM
2.2.4 Benefits and goals of E – SCM
2.2.5 E-Logistics of UPS

UNIT III: Electronic Payment Systems   **(10periods)**

3.1 Types of EPS
3.2 Traditional payment system and modern payment system
3.3 Steps for electronic payment
3.4 Payment security

UNIT IV: Introduction to Web Designing   **(12periods)**

4.1 **HTML**
4.1 .1   Define HTML
4.1.2   Structure of HTML
   4.1.3   Basic HTML tags
4.1.4   Formatting HTML tags

4.2 **Lists**
4.2.1 Ordered List
   4.2.2   Unordered List

4.3 **Links**
4.3.1   Link tag
   4.3.2   Image tag
   4.3.3   Marquee tag

4.4 **Tables**
4.4.1   Table Creation
   4.4.2   Attributes of Table

4.5 **forms& Frames**
4.5.1 Forms creation
   4.5.2   Form tag
   4.5.3   Input fields of form
4.5.4   Frame Creation
   4.5.5   Frameset tag
4.5.6   Frame tag

UNIT V: Introduction to WIX Editor   **(18periods)**

  5.1 Getting Started with Wix
   5.1.1 Adding and Editing Text
   5.1.2 Adding a Site Title
   5.1.3 Changing Your Text Font
   5.1.4 Creating a Clickable URL
   5.1.5 Adding Language Fonts
   5.1.6 Adding Elements to Your Site
   5.1.7 Arranging the Content on Your Site's Pages
   5.1.8 About the Header
   5.1.9 About the Footer

5.2Adding an Image to Your Page Background
   5.2.1 Uploading Your Own Background Image
   5.2.2 Adding a Video to Your Page Background
   5.2.3 Uploading Your Own Video Page Background
   5.2.4 Uploading Your Own Images
   5.2.5 Adding a Logo to Your Site
   5.2.6 Adding a Link to an Image

5.3 Gallery and Button
   5.3.1 Adding a Gallery
   5.3.2 Cropping and Editing Gallery Images
   5.3.3 Adding and Setting Up an Icon Button
   5.3.4 Adding a Link to a Button

5.4 Video
   5.4.1 Adding a Video from YouTube
   5.4.2 Retrieving a YouTube URL

5.5 Menu
   5.5.1 Adding a Site Menu
   5.5.2 Customizing Your Menu Design
   5.5.3 Adding and Deleting a Menu Folder
   5.5.4 Reordering Menu Items
   5.5.5 Changing the Direction of Menu Items

Text Book:
1. Uttam Kumar Roy, Web Technologies, Oxford University Press.
2. E-Commerce- A Managerial Perspective- P. T. Joseph, Prentice- Hall of India, New Delhi, 2005.

References:
1. Kogent Learning Solutions Inc.(Author), "Black Book HTML 5.0", dreamtech.
2.Daniel Amor, E-Bussiness R(Evolution), Pearson Edude, New Delhi, 2005.

Weblink: **https://support.wix.com/en/the-wix-editor/editor-basics**

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Computer Science	CABP21A	2022-23	B. Com (Computers Applications)

Semester - II   PAPER-I   **Credits: 1**

WEB DESIGNING LAB

COURSE OBJECTIVES:
The purpose of this course is to introduce to students to the field of creation web pages using HTML language. The students will be able to enhance their analyzing and help to creation for Web Site Design

COURSE OUTCOMES:

COURSE OUTCOME NO	on successful completion of this course, students should have the knowledge and skills to
CO1	Implement HTML tags.
CO2	plementing lists and tables in web pages.
CO3	plementing frames in web pages.
CO4	plementing frames in web pages.
CO5	eation of CSS in a web page.

Week 1: Write a HTML program to print text in bold and italic font.

Week 2: Write a HTML program to print Heading tags.

Week 3: Write a HTML program using Text formatting tags

Week 4: Write a HTML program to implement unordered lists.Write a HTML program to implement order lists.

Week 5: Write a html file which display 3 images at LEFT, RIGHT and CENTER respectively in the browser.

Week 6: Create a HTML file which contains hyperlinks.

Week 7: Write a HTML program to Create a table

Week 8: Write a HTML program to Create a table using RowSpan and ColSpan.

Week 9: Write a HTML program to Create a simple form

Week 10: Create a Registration form that interacts with the user. Collect login name, password, date of birth, gender, address, qualification.

Week 11: Create a HTML page using frameset tag.

Developing Websites using WIX: https://www.wix.com/blog/2020/05/how-to-design-a-website/

Week 12: An online store to sell your products.

Week 13: A photography website to display and sell prints.

Week 14:A fitness website to book new clients.

Week 15: A restaurant website to help with online orders, delivery and payment.

A.G & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

Vuyyuru-521165. NAAC reaccredited at 'A' level
Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: **Information Technology**

Semester: II   PAPER-III

Course Code	**CABT11A**	Course Delivery Method	Class Room / Blended Mode – Both
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2020-21	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

COURSE OBJECTIVES:

It provides to learn computer basics and basic principles of using Windows operation system and be able to access the Internet, data communication, Software, hardware and various new technologies in information technology.

Course Outcomes:

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to
CO1	Understand fundamental concepts of a computer and its basic components
CO2	Understand basic functioning of an operating system and customizing Windows Desktop
CO3	Analyze type of soft ware's and programming languages
CO4	Have knowledge in basic Network and Data Communication Concepts
CO5	Understand the need of data mining and get familiarize with basics of new concepts like KDD, OLAP

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Semester II	Course Code	Course Title	Credits	Periods
B.Com.(E-Commerce)	CABT11A	Information Technology	4	75

UNIT-I: INTRODUCTION: **13Periods**

1.1 Introduction to computers
1.2 Generations of computers
1.3 An overview of computer system - Types of computers
1.4 Input & Output Devices.
1.5 Hardware: Basic components of a computer system- Control unit– ALU- Input/output functions.

1.6 Memory – RAM – ROM – EPROM - PROM and Other types of memory.

UNIT-II: OPERATING SYSTEM (OS):   **12Periods**

2.1 Meaning - Definition & Functions.
2.2 Types of OS - Booting process
 2.2.1 DOS – Commands (internal & external) - Wild card characters
2.3 Windows: Using the Start Menu –Control Panel – Using multiple
 2.3.1 Windows – Customizing the Desktop – Windows accessories (Preferably latest version
 of windows or Linux Ubuntu).

Unit-III: SOFTWARE: **15Periods**

3.1 System software and application software.
 3.1.1 Operating system windows OS,
 3.1.2 Mobile device operating system and notebook operating systems
3.2 Application software Types of personal application software
3.2.1 Spread sheet-data management
3.2.2 Word processing
3.2.3 Desktop publishing
3.2.4 Graphics, CAD, CAM, CIM
3.3 Programming Languages
3.3.1 Assembly language
3.3.2 Procedural language, non-procedural language, natural programming language.
3.3.3 Hypertext mark-up language, modeling language, object-oriented programming language.

Unit-IV: DATA COMMUNICATION: **20 Periods**

4.1 Telecommunication and Networks Communication media& channel cable media

4.1.1 Broad cast media channels twisted pair
4.1.2 Coaxial cable, fibers optical cable, micro wave, satellite, radio, cellular radio,
 Infrared global positioning system.
4.2 Introduction, Analog and Digital signals, modulation need of modulations, modems.
4.3 Telecommunication System communication processors:
4.3.1 Modem
4.3.2 Multiplexers
4.3.3 Front –end-processor.
4.4 Networks LAN, WAN, VAN, virtual private network (VPN).
4.5 Internet, intranet and Extranets
4.5.1 The evolution of the internet, service provided by the internet, World Wide Web.

Unit-V: NEW TECHNOLOGIES: **10 Periods**

5.1New technologies in Information Technology:

5.1.1 Introduction to hyper media, artificial intelligence and business intelligence, knowledge discovery
 in database (KDD)

5.2 Data warehouse and data marts. Data mining and OLAP.

Student Activity:

Students have to submit assignments and give seminars on various topics allotted to them.
Total of 5 Hrs is allotted for student seminars. Student activity also includes gathering of
 information related to latest technologies in computers.

Library Activity:

Students will visit library in their allotted time and will refer various text books to gather information
for their assignments.

TEXT/ REFERENCE BOOKS:

1. B.E.V.L.Naidu, V.V.. Devi Prasad Konti, Ganti Naga Srikanth, Himalaya publishing House.
2. Introduction to Computers: Peter Norton, McGraw Hill

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COMPUTER SCIENCE	ECCSCT21	2022-'23	B.Com (E-Commerce)

SEMESTER – II　　　　　　**PAPER – II**　　　　　　　　Max. Marks 70

Syllabus: Programming in 'C'

NO of Hours: 4　　　　　**No Of Credits: 3**　　　　**Pass Marks :28**

UNIT-I: General Fundamentals& Programming Languages　　　　　　**10Hrs**

General Fundamentals: Introduction to computers: Block diagram of a computer, characteristics and limitations of computers, applications of computers, types of computers, computer generations. Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms, Flow Charts, **Programming Languages** – Generations of Programming Languages – Structured Programming Language- Design and Implementation of Correct, Efficient and Maintainable Programs.

UNIT- II: Introduction To C & Decision Making control Statements　　　**12Hrs**

Introduction to C: Introduction – Structure of C Program – Writing the first C Program – File used in C Program – Compiling and Executing C Programs – Using Comment , Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C-Operators in C- Programming Examples.

Decision Control and Looping Statements: Introduction to Decision Control Statements– Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – Goto Statement.

UNIT III: Arrays　　　　　　　　　　　　　　　　　　　**10 Hrs**

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array– Operations on Arrays – one dimensional, two dimensional and multi dimensional arrays, character handling and strings.

UNIT-IV:Functions & Structures　　　　　　　　　　　　　**13Hrs**

Functions: Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions.

Structure, Union, and Enumerated Data Types: Introduction – Nested Structures – Arrays of Structures – Structures and Functions– Union – Arrays of Unions Variables – Unions inside Structures – Enumerated Data Types.

UNIT-V:Pointes&Files　　　　　　　　　　　　　　　　**15Hrs**

Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers -– Memory Allocation in C Programs – Memory Usage – Dynamic Memory Allocation – Drawbacks of Pointers

Files: Introduction to Files – Using Files in C – Reading Data from Files – Writing Data to Files – Detecting the End-of-file – Error Handling during File Operations – Accepting Command Line Arguments.

BOOKS

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language" -

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COMPUTER SCIENCE	ECCSCP21	2022-'23	B.Com (E-Commerce)

SEMESTER – II   **PAPER – II**   **Max. Marks 70**

Syllabus: <mark>Programming in 'C' Lab</mark>

Cycle-I

Week 1:

Write a C program to check whether the given two numbers are equal, bigger or smaller?

Week 2:

Write a C program to perform arithmetic operations using Switch...case?

Week 3:

☐ Write a program to find the sum of individual digits of a positive integer.

☐ Write a program to check whether the given number is Armstrong or not.

Week 4:

Write a program to generate the first N terms of the Fibonacci sequence.

Week 5:

Write a program to find both the largest and smallest number in a list of integer values

Week 6:

☐ Write a program that uses functions to add two matrices.

☐ Write a program for multiplication of two n X n matrices.

Week 7:

Write a program to demonstrate refection of parameters in swapping of two integer values using Call by

Value& Call by Address.

Week 8:

Write a program to calculate factorial of given integer value using recursive functions.

Cycle-II

Week 9:

Write a program to search an element in a given list of values.

Week 10:

Write a program to illustrate pointer arithmetic.

Week 11:

Write a program to sort a given list of integers in ascending order.

Week 12:

Write a program to calculate the salaries of all employees using Employee (ID, Name, Designation, Basic Pay,

DA, HRA, Gross Salary, Deduction, Net Salary) structure.

a. DA is 30 % of Basic Pay

b. HRA is 15% of Basic Pay

c. Deduction is 10% of (Basic Pay + DA)

d. Gross Salary = Basic Pay + DA+ HRA

e. Net Salary = Gross Salary - Deduction

Week 13:

Write a program to perform various string operations.

Week 14:

Write a program to read the data character by character from a file.

Week 15:

Write a program to create Book (ISBN, Title, Author, Price, Pages, Publisher) structure and store book details

in a file and perform the following operations

a. Add book details

b. Search a book details for a given ISBN and display book details, if available

c. Update a book details using ISBN

d. Delete book details for a given ISBN and display list of remaining Books.

Adusumilli Gopalakrishnaiah & Sugar Cane Growers
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Accredited by NAAC with "A" Grade
ISO 9001:2015 Certified Institution

DEPARTMENT OF COMPUTER SCIENCE (PG)

2022-23

HIGHLIGHTED SYLLABUS OF M.Sc. (Computer Science)

Courses on Employability, Skill-Development and Entrepreneurship in the curriculum of all programs are highlighted as mentioned:

Employability

Skill-Development

Entrepreneurship

Course	Programming and Problem Solving Using Python		
Course Code	22CS1T1	Course Delivery Method	Class Room /
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

Course Description and Purpose: Python Programming is a course that illustrates basic concepts of Python programming, Decision Control Statements, Functions and Modules, Python Strings Revisited, Data Structures, Classes and Objects, Inheritance, Operator Overloading, Pandas, Error and Exception Handling, File Handling,Numpy, Matplotlib.

Course Objectives:

This course will help enable the students to understand, learn and develop a various Decision Control Statements, Functions & Modules, Strings, Data Structures, Classes and Objects, Inheritance, Operator Overloading, Pandas, Error and Exception Handling, Handling Files, Databases.

Specific objectives include:
➢ To understand basics of *Python Programming*.
➢ To gain knowledge on *Decision Control Statements* and *Functions & Modules and Python Strings* and *DataStructures*.
➢ To gain knowledge on *Classes & Objects, Ingeritance.*
➢ To apply *Operator Overloading, Error and Exception Handling* and Pandas.
➢ To gain knowledge on File Handling, Database Connection, basics of Numpy and matplotlib.

Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:

• Understand basics of Python Programming.
• Gain knowledge on *Decision Control Statements* and *Functions & Modules* and *Python Strings* and *DataStructures*.
• Gain knowledge on *Classes & Objects & Inheritance.*
• Apply Operator Overloading, Error and Exception Handling and Pandas.
• Gain Knowledge on File Handling, Database Connection and basics of Numpy and matplotlib

Unit	Learning Units	Lecture Hours
I	**Basics of Python Programming:** Features of Python, History of Python, The Future of Python, Writing and Executing First Python Program, Literal Constants, Variables and Identifiers, Data Types, Input Operation, Comments, Reserved Words, Indentation, Operators and Expressions, Expressions in Python, Operations on Strings, Other Data Types, Type Conversion. **Decision Control Statements**: Conditional Branching Statements, Basic Loop Structures, Nested Loops, The Break Statement, The Continue Statement, The Pass Statement, The Else Statement used with Loops.	15
II	**Functions and Modules:** Function Definition, Function Call, Variable Scope and Lifetime, The Return Statement, More on Defining Functions, Recursive Functions, Modules, Packages in Python, Standard Library Modules. **Python Strings Revisited:** Concatenating, Appending and Multiplying Strings, String Formatting Operator, Built in String Methods and Functions, Comparing Strings, Regular Expressions. **Data Structures:** Sequence, Lists, Functional Programming, Tuple, Sets, Dictionaries.	15
III	**Classes and Objects:** Classes and Objects, Class Method and self Argument, Class Variables and ObjectVariables, Public and Private Data Members, Private Methods, Calling a Class Method from Another Class Method, Built in Class Attributes, Class Methods, Static Methods. **Inheritance:** Inheriting Classes in Python, Types of Inheritance, Abstract Classes and Interfaces.	15
IV	**Operator Overloading:** Concept of Operator Overloading, Advantage of Operator Overloading, Implementing Operator Overloading. **Pandas:** Introduction, Getting Started, Series, Data Frame**,** Read CSV, Read JSON **-**Analyzing Data Frames, Cleaning Data, Cleaning Empty Cell, Cleaning Wrong Format, Cleaning Wrong Data, Removing Duplicates, Correlations, Plotting. **Error and Exception Handling:** Introduction to Errors and Exceptions, Handling Exceptions, Raising Exceptions, Built in and User defined Exceptions.	15
V	**File Handling:** File Path, Types of Files, Opening and Closing Files, Reading and Writing Files. **Databases:** Database Table Creation, Select Operation, Insert Operation, Delete Operation, Update Operation,Drop Table. **Numpy:** Basic Functions of Numpy. **Matplotlib:** Basic Functions of Matplotlib.	15

Prescribed Text Book			
	Author	Title	Publisher
1	Reema Thareja	Python Programming Using Problem Solving Approach	Oxford University Press, June 2017.

Reference Text Book			
1	Vamsi Kurama	Python Programming, A Modern Approach	Pearson, 2017
2	Wesley Chun	Core Python Programming	Prentice Hall, December 2000
	e-resources: https://www.w3schools.com/python/pandas/		

Course	Database Management Systems		
Course Code	22CS1T2	Course Delivery Method	Class Room / Blended Mode
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

Course Description and Purpose:

Database Management Systems is a course that illustrates basic concepts of *Databases and Database Users*, *Database System Architecture*, *ER & EER Relationship Modeling*, *Structured Query Language*, *Relational Algebra and Relational Calculus*, *Functional Dependencies and Normalization for Relational Databases*, *Transaction Processing Concepts*, *Concurrency Control Techniques* and *Emerging Database Technologies and Applications.*

Course Objectives:

This course will help enable the students to understand, learn and develop a various *Relational Data Models*, Querying, ER *& EER Modeling*, *Relational Algebra & Calculus*, *Functional Dependencies and Normalization*, *Transaction Processing*, *Concurrency Control* and *Emerging Database Technologies and Applications.*

Specific objectives include:
➢ To understand basic concepts of *Database and Database Users*, *Database Architecture*.
➢ To understand *ER*, *EER Modelling* and *Relational Algebra and Relational Calculus*.
➢ To learn the basics of *Functional Dependencies and Normalization* for Relational Databases.
➢ To learn *Transaction Processing* and *Concurrency Control Techniques*.
➢ To understand the *Structured Query Language* and *Emerging Database Technologies* and Applications:

Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:

▪ Understand basic concepts of *Database and Database Users*, *Database Architecture*.
▪ Understand *ER*, *EER Modeling* and *Relational Algebra and Relational Calculus*.
▪ Learn the basics of *Functional Dependencies and Normalization* for Relational Databases.
▪ Learn *Transaction Processing* and *Concurrency Control Techniques*.
▪ Understand the *Structured Query Language* and *Emerging Database Technologies and Applications*.

Unit	Title	Lecture Hours
I	**Database and Database Users:** Introduction, Characteristics of the Database Approach, Actors on the Scene, Workers behind the Scene, Advantages of the using the DBMS Approach. **Database System Concepts and Architecture:** Data Models, Schemas and Instances, Three Schema Architecture and Data Independence, Database Languages and Interfaces, Centralized and Client/Server Architecture for DBMS, Classification of Database Management Systems.	15
II	**Data Modeling Using the ER Model:** Conceptual Data Models, Entity Types, Entity Sets, Attributes and Keys, Relationship Types, Relationship Sets, Roles and Structural Constraints, Weak Entity Types, Relationship Types of Degree Higher than Two, Refining the ER Design for the COMPANY Database. **The Enhanced Entity-Relationship Model:** Sub Classes, Super Classes and Inheritance, Specialization and Generalization, Constraints and Characteristics of Specialization and Generalization. **The Relational Algebra and Relational Calculus:** Unary Relational Operations: SELECT and PROJECT, Relational Algebra Operations from Set Theory, Binary Relational Operations: JOIN and DIVISION, Additional Relational Operations, Examples, The Tuple Calculus and Domain Calculus	15
III	**Functional Dependencies and Normalization for Relational Databases:** Informal Design Guidelines for Relation Schemas, Functional Dependencies, Normal Forms Based in Primary Keys, General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form, Inclusion Dependencies.	15
IV	**Introduction to Transaction Processing Concepts and Theory:** Introduction to Transaction Processing, Transaction and System Concepts, Desirable Properties of Transactions, Characterizing Schedules Based on Recoverability, Characterizing Schedules based on Serializability. **Concurrency Control Techniques:** Two Phase Locking Techniques for Concurrency Control, Concurrency Control Based on Timestamp Ordering, Multiversion Concurrency control techniques, Validation Concurrency Control Techniques.	15
V	**SQL-99:** Schema Definition, Constraints, Queries and Views: SQL Data Definitions and Data Types, Specifying Constraints in SQL, Schema Change Statements on SQL, Basic Queries in SQL, More Complex SQL Queries, INSERT, DELETE and UPDATE statements in SQL, Triggers and Views. **Emerging Database Technologies and Applications:** Mobile Databases, Multimedia Databases, Geographic Information Systems.	15

Prescribed Text Book

	Author	Title	Publisher
1	Ramez Elmasri, Shamkant B. Navathe	Fundamentals of Database Systems	Pearson Education, SeventhEdition, 2017
2	C.J.Date, A.Kannan, S.Swamynathan	An Introduction to Database Systems	VII Edition, PearsonEducation , 2006.
3	Peter Rob, Carlos Coronel	Database Systems-Design, Implementation and Management	Eight Edition,Thomson, 2008

A.G & S.G Siddhartha Degree College of Arts & Science, Vuyyuru – 521165.
(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (ComputerScience)Programme - I Semester

Course	Formal Languages and Automata Theory		
Course Code	22CS1T3	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours /	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:**2020-21**	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision:0%

Course Description and Purpose:

Formal Languages and Automata Theory deals with the concepts of *Automata*, *Formal Languages*, *Grammar*, *Algorithms*, *Computability*, *Decidability and Complexity*. It also helps to develop methods by which computer scientists can describe and analyze the dynamic behavior of *Discrete Systems*, in which signals are sampled periodically.

Course Objectives*:*
- To understand basic properties of *Deterministic* and *Nondeterministic Finite Automat.*
- To understand *Context Free Languages* and *Grammers*, and also *Normalising CFG.*
- To understand the concept of *Pushdown Automata Turing Machine* and its application.
- To understand Basic Structure of *Compiler Design.*
- To understand the concept of *Lex* and *Syntax Analysis.*

Course Learning Outcomes:

At the end of this course the students should be able to:

- Understand basic properties of *Deterministic* and *Nondeterministic Finite Automat.*
- Understand the *Context Free Languages* and *Grammers*, and also *Normalising CFG.*
- Understand the concept of *Pushdown Automata Turing Machine* and its application.
- Understand Basic Structure of *Compiler Design.*
- Understand the concept of *Lex* and *Syntax Analysis.*

Unit	Learning Units	LectureHours
	Fundamentals: Strings, Alphabet, Language, Operations, Finite Automaton Model, Acceptance of Strings andLanguages, Transition Table and Transition Diagrams. **Finite Automata:** Deterministic Finite Automaton, Non deterministic Finite Automaton and NFA with ε Transitions, Significance, Equivalence between NFA with and without ε Transitions, NFA to DFA Conversion,Minimization of FSM, Equivalence between two FSMs, Finite Automata with Output-Moore and Mealy Machines.	15
II	**Regular Languages:** Regular Sets, Regular Expressions, Identity Rules, Construction of Finite Automata(DFA) for a given Regular Expressions and its inter conversion using State Elimination and Ardens Theorem, Pumping Lemma of Regular Sets, Closure Properties of Regular Sets (Proofs not required).	15
III	**Context free grammar:** Introduction, Derivation Trees, Ambiguity in Context Free Grammars. Minimization ofContext Free Grammars. Chomsky Normal Form, Greibach Normal Form. **Push down Automata:** Definition, M odel, D esign of PDA. The Language of PDA- Acceptance by Final State, Acceptance by Empty Stack ,Equivalence of CFL and PDA -Conversion of CFL to PDA and PDA to CFL **Turing Machine:** Definition, Turing Machine Model, Types of Turing machine (problems not required),Types of Turing machine ,Recursively Enumerable Languages and Recursive Languages Chomsky Hierarchy ofLanguages and Post correspondence problem.	15
IV	**Compiler**: Introduction, Structure of a compiler, Design issues of compiler, Phases of Compiler, Lexical Analysis, Role of Lexical Analyzer, Input Buffering, Specification of Tokens, Recognition	15
V	**Lex (Lexical-Analyzer Generator):** Uses of Lex, Structure of Lex Programs, Conflict Resolution in Lex , TheLookahead Operator.**Syntax Analysis:** Top Down Parsing, Recursive-Descent Parsing, FIRST and FOLLOW, LL(l) Grammar,Nonrecursive Predictive Parsing, Error Recovery in Predictive Parsing. Bottom-Up Parsing- Reductions, Handle Pruning, Shift-Reduce Parsing ,Conflicts During Shift-Reduce Parsing.	15

Prescribed Text Book

	Author	Title	Publisher
1	Hopcroft. H.E. and Ullman	Introduction to Automata Theory Languages and Computation	J. D. Pearson Education, January
1	Jeffery D.Ullman	Compilers-Principles, Techniques and Tools	2nd Edition, Pearson Education, January
	John C Martin	Introduction to Languages and the Theory of Computation	Tata McGraw-Hill, 2003

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(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (ComputerScience)Programme - I Semester

Course	OPERATING SYSTEMS		
Course Code	22CS1T4	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:**2020-21**	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision:100%

Course Description and Purpose:

Operating Systems is a course that illustrates *Operating System Concepts*, *Operating System Structure*, *Processes Concepts*, *Threads*, *Process Synchronization*, *Scheduling*, *Deadlocks*, *Main Memory*, *Virtual Memory*, *Mass Storage Structure*, *File System Implementation*,. *Distributed Operating Systems* and *Mobile & Android Operating Systems*

Course Objectives:
This course will help enable the students to understand and learn *Operating System Concepts*, *Operating Structure*, *Process Concepts*, *Thread Concept*, *Process Synchronization*, *Scheduling*, *Deadlocks*, *Main Memory*, *Virtual Memory and Mass Storage Structure*, *File System Implementation*, *Distributed Operating Systems* and *Mobile & Android Operating Systems*.

Specific objectives include:
➢ To understand the *Basic Concepts of Operating System*, *Operating System Structure and ProcessConcept*.
➢ To apply concepts of *Threads*, *Process Synchronization & CUP Scheduling*.
➢ To understand *Deadlock*, *Main Memory & Virtual Memory*.
➢ To explain *Mass Storage Structure*, *File System Interface & File System Implementation*.
➢ To understand the concepts of *Distributed Operating Systems* and *Mobile & Android OperatingSystems*.

Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:

• Understand the Basic Concepts of Operating System, Operating System Structure and ProcessConcept.
• Applying concepts of Threads, Process Synchronization & CUP Scheduling.
• Understand Deadlock, Main Memory & Virtual Memory.
• Explain Mass Storage Structure, File System Interface & File System Implementation.
• Understand the concepts of Distributed Operating Systems and Mobile & Android Operating Systems.

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**Introduction to Operating System Concepts:** Functions of Operating System, Operating System Structure,Operating System Operations, Kernel Data Structure, Computing Environment. **Operating System Structures:** Operating System Services, System Calls, Types of System Calls. **Processes:** Process Concept, Process Scheduling, Operations on Processes, Inter Process Communication,Communication in Client-Server Systems.	15
II	**Threads:** Overview, Multicore Programming, Multithreading Models, Thread Libraries, ImplicitThreading, Threading Issues. **Process Synchronization:** Background, The Critical Section Problem,Peterson's Solution,Synchronization Hardware, Mutex Locks, Semaphores, Classic Problems of Synchronization, Monitors. **CPU Scheduling:** Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling,Multiple Processor Scheduling.	15
III	**Deadlocks:** System Model, Deadlock Characterization, Methods for Handling Deadlocks, DeadlockPrevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. **Main Memory:** Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of thePage Table, Intel 32 and 64-bit Architectures. **Virtual Memory:** Background, Demand Paging, Copy-on-Write, Page Replacement, Allocation ofFrames,Thrashing.	15
IV	**File System Interface:** File Concept, Access Methods, Directory and Disk Structure, File SystemMounting, Protection. **File System Implementation:** File System Structure, File System Implementation, Directory Implementation,Allocation Methods, Free Space Management, Efficiency and Performance, Recovery.	15
V	**Distributed Operating Systems:** Types of Network based Operating Systems, Network Structure, NetworkTopology, Communication Structure, Communication Protocols, Robustness, Design Issues. **Mobile & Android Operating Systems:** A review of Mobile Operating Systems, Features of Android OperatingSystems.	15

Prescribed Text Book

	Author	Title	Publisher
1	Abraham Silberschatz & PeterBaer Galvin, Greg	Operating System Concept	Ninth Edition, Wiley, 2015

Reference Text Books

	Author	Title	Publisher
1	William Stallings	Operating Systems-Internals and Design Principles	Fifth Edition, Pearson Education,2007
2	Achyut S Godbole	Operating Systems	Second Edition, TMH, 2007

Course	Personality Development through Life Enlightenment skills		
Course Code	22PG101	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction: **2022-23**	Year of Offering: **2022-23**	Year of Revision: **2022-23**	Percentage of Revision: 0%

Course Description and Purpose:

Personality development is the development of your behavior patterns and attitude. It is the result of where we are born" the circle we interact with and our personal temperament. Every person is different. There are some characteristics traits that make you .,you". Personality development through life enlightenment course aims to help students identify negative behaviors which may be stopping them from reaching their desired goals. This course will help students both in their personal and desired professional life. The other purposes of personality development through life enlightenment course are to enable you lead stress-free and healthier life, ethical decision making ability" enhanced confidence level, and building a more pleasing personality.

Course Objectives:

At the end of this course the students should be able to:

- Develop their personality and achieve their highest goals of life.
- Lead the nation and mankind to peace and prosperity.
- Practice emotional self regulation.
- Develop a positive approach to work and duties.
- Develop a versatile personality.

Course Learning Outcomes:

At the end of this course the students should be able to:
- Develop their personality and achieve their highest goals of life.
- Lead the nation and mankind to peace and prosperity
- Practice emotional self regulation.
- Develop a positive approach to work and duties
- Develop a versatile personalit

UNIT- I :

Introduction to Personality Development The concept of personality - Dimensions of Personality - Theories of Personality development (Freud & Erickson) -'fhe concept of Success and Failure - Factors responsible for Success - Hurdles in achieving Success and Overcoming Hurdles - Causes of failure - Conducting SWOT (Strengths" Weaknesses, Opportunities and Threats) analysis.

UNIT- II:

Attitude. Motivation and Self-esteem

Conceptual overview of Attitude - Types of Attitudes - Attitude Formation -. Advantages/Disadvantages of Positive,4ltregative Attitude - Ways to Develop Positive Attitude C'oncept of motivation: Definition and Nature of Motivation/Motive * Internal and external motives - Theories of Motivation - Importance of self- motivation- Factors leading to de- motivation. **Self - esteem** - Definition and Nature of self'-esteem - Do's and Don'ts to develop positive self esteem - Low self esteem - Personality having low self esteem - Positive and negative self esteem.

UNIT- III:

Other Aspects of Personality Development Body language - Problem-solving - Contlict Management and Negation skills - Decision-making Skills - Leadership and qualities of a successful leader - Character building - Team-work – Time management - Work ethics - Good manners and etiquette - Emotional Ability/intelligence - Dimensions of Emotional Intelligence - Building Emotional Intelligence.

UNIT- IV:

Neetisatakam-Hol istic Development of Personal ity Verses- 19.20,21"22 (wisdom) - Verses- 29.31,32 (pride and heroism) - Verses- 26.28.63.65 (virrue) Personality of Role Model - Shrimad Bhagwadgeeta Chapter2-Verses 17 - Chapter 3-Verses 36,37,42 - Chapter 4-Verses 18, 38,39 - Chapterl8 -
Verses 37,38,

UNIT- V:

Yoga & Stress Management Meaning and definition of Yoga - Historical Perspective of Yoga - Principles of Astanga Yoga by Patanjali- Meaning and Definition of Stress - Types of Stress - Eustress and Distress -stress Vlanagement -- Pranayama- Pranayama: Anulom and Vilom Pranayama - Nadishudhi Pranayama - Kapalabhati- Pranayama - Bhramari Pranayama - Nadanusandhana Pranayama * Meditation techniques: Om Meditation - Cyclic meditation : Instant Relaxation technique (QRT). Quick Relaxation'l'echnique (QR'f). Deep Relaxation J'echnique (DRT) (Theory & Practical).

PRACTICAL COMPONENTS:

- Students should identify different types of personality to know their own personality. Students are to describe the characteristics of their personalities and submit the same for assessment.
- Students are to form in groups (a group consists of 4-6 students) to identify and write a brief note on famous personalities of India and World.
- Students are required to identify diff-erent types of attitudes and give any five examples of each.
- Students are expected to check their attitudes and develop ways to improve their attitudes at work place and home.
- Students are required to identify keys to self -motivation to achieve their goals.
- Students are expected to identify at least seven types of body language and conduct activities with the following:

S. No	Pose	Possible Interpretations
	nding with your hands on hips	gressive, disgusted
	nding upright	nfidence
	ms crossed on your chest	fensive
	sting your hand on your cheek	inking
	uching or rubbing your nose	ubt, lying
	sting your head in your hands	redom, Tired
	pping your fingers	patience
	ing your nails	rvous, Insecure
	ying with your hair	ecure
	bbing your eyes	sbelief, doubt

A.G & S.G Siddhartha Degree College of Arts & Science, Vuyyuru – 521165.
(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (Computer Science) Programme – III Semester

Course	Internet of Things		
Course Code	20CS3T1	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-	Year of Revision:2021-22	Percentage of Revision: 0%

Course Objective: To understand and gain knowledge on *Over View* of *Internet of Things*, *Models*, *Layers* & S*tandardization, Protocols* & *Design Principles* for Connected Devices, *Internet Connectivity Principles*, *Protocols* & *Application Layer Protocols, Data Acquiring*, *Business Models*and *Business Processes*.

Course Outcomes: On successful completion of the course student will be able to:

CO1: Attain knowledge over view of *Internet of Things*.

CO2: Understand *Models*, *Layers* & *Standardization*.

CO3: Apply *Protocols* & *Design Principles* for Connected Devices.

CO4: Understand *Internet Connectivity Principles*, *Protocols* & Application Layer Protocols.

CO5: Understand *Data Acquiring*, *Business Models* and *Business Processes*.

Syllabus

Unit	Learning Units	Lecture Hours
I	**The Internet of Things:** An Overview of Internet of Things, Internet of Things Technology, Behind IoT Sources of the IoT, M2M Communication, Examples of IoT, Design Principles for Connected Devices, Business Models for Business Processes in the Internet of Things.	12
II	**Design Principles for Connected Devices:** IoT / M2M systems layers and Designs Standardizations, Modified OSI Stack for the IoT / M2M Systems, ETSI M2M Domains and High-level Capabilities ,Communication Technologies, Data Enrichment and Consolidation and Device Management Gateway ease of Designing and Affordability.	12
III	**Design Principles for the Web Connectivity:** Design Principles for the Web Connectivity for Connected Devices, Web Communication Protocols for Connected Devices, Message Communication Protocols for Connected Devices, Web Connectivity for Connected Devices.	12
IV	**Internet Connectivity Principles:** Introduction, Internet Connectivity, Application Layer Protocols: *HTTP, HTTPS, FTP, Telnet.*	12
V	**Data Acquiring, Organizing and Analytics in IoT / M2M**: Introduction, Applications / Services / Business Processes, IOT / M2M Data Acquiring and Storage, Business Models for Business Processes in the Internet of Things, Organizing Data, Transactions, Business Processes, Integration and Enterprise Systems.	12

Prescribed Text Book			
	Author	Title	Publisher
1	Rajkamal	Internet of Things: Architecture, Design Principles and Applications	McGraw Hill Higher Education

Reference Text Book			
	Author	Title	Publisher
1	Adrian McEwen and Hakim Cassimally	Designing the Internet of Things	Wiley
2	CunoPfister	Getting Started with the Internet of Things.	Oreilly

Course Focus: Employability

Websites of Interest:

1. https://dzone.com/iot-developer-tutorials-tools-news-reviews
2. https://www.ibm.com/blogs/internet-of-things/

A.G & S.G Siddhartha Degree College of Arts & Science, Vuyyuru – 521165.
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M.Sc., (ComputerScience)Programme - III Semester

Course	Cryptography & Network Security		
Course Code	20CS3T2	Course Delivery	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

Course Objective: To understand and gain knowledge on *Computer & Network Security*, *Number Theory, Classical Encryption Techniques*, *Advanced Encryption Standard and Random Bit Generation and Stream Ciphers*, *Number Theory*, *Public Key Cryptography and RSA*, *Other Public-Key Crypto Systems and Message Authentication Codes*, *Digital Signatures*, *Key Management and Distribution* and *User Authentication*, *Transport Level Security*, *Electronic Mail Security and IP Security* and *Intruders and Firewalls*.

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

CO1 : Understand Computer & Network Security Concepts*,* Classical Encryption Techniques and Advanced Encryption Standard.
CO2 : Gain knowledge on *Number Theory*, *Public Key Cryptography and RSA*, *Other Public-KeyCrypto Systems* and *Message Authentication Codes*.
CO3 : Know Digital Signatures*,* Key Management and Distribution *and* User Authentication.
CO4 : Understand *Transport Level Security*, *Electronic Mail Security* and *IP Security*.
CO5 : Gain knowledge about *Intruders and Firewalls.*

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**Computer & Network Security Concepts:** Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, A Model for Network Security. **Classical Encryption Techniques:** Symmetric Cipher Model, Substitution Techniques, Transposition Techniques **Advanced Encryption Standard:** AES Structure, An AES Example, AES Implementation. Random Bit Generation and Stream Ciphers: Principles of Pseudo Random Number Generation, Pseudo Random Number Generators.	12

II	**Introduction to Number Theory:** Divisibility and the Division Algorithm, The Euclidean Algorithm, Modular Arithmetic, Prime Numbers, Fermat's and Euler's Theorems, Testing for Primality, The Chinese Remainder Theorem, Discrete Logarithms. **Public Key Cryptography and RSA:** Principles of Public Key Crypto Systems, The RSA Algorithm. **Other Public-Key Crypto Systems:** Key Management, Diffie-Hellman Key Exchange,Elliptic Curve Arithmetic, Elliptic Curve Cryptography. **Message Authentication Codes:** Message Authentication Requirements, Message Authentication Functions, Requirements for Message Authentication Codes, Security of MACs, MACs Based on Hash Functions: HMAC.	12
III	**Digital Signatures:** Digital Signatures, NIST Digital Signature Algorithm. **Key Management and Distribution:** Symmetric Key Distribution Using Asymmetric Encryption,Distribution of Public Keys. **User Authentication:** Kerberos, Remote User-Authentication Using Asymmetric Encryption.	12
IV	**Transport Level Security:** Transport Layer Security. **Electronic Mail Security:** S/MIME, Pretty Good Privacy. **IP Security:** IP Security Overview, IP Security Policy, Encapsulating Security Payload,Combining Security Associations.	12
V	**Intruders:** Intruders, Intrusion Detection, Password Management. **Firewalls:** The Need for Firewalls, Firewall Characteristics and Access Policy, Types of Firewalls.	12

Prescribed Text Book			
	Author	Title	Publisher
1	William Stallings	Cryptography and Network Security	Pearson, Seventh Edition, 2017
Reference Text Book			
	Author	Title	Publisher
1	William Stallings	Cryptography and Network Security	Pearson, Sixth Edition, 2014
2	William Stallings	Network Security Essentials-Applications and Standards	Pearson Education (2007), Third Edition.
3	Chris McNab	Network Security Assessment	OReilly (2007), 2nd Edition
4	Jon Erickson	Hacking-The Art of Exploitation	Press (2006),SPD
5	Neal Krawety	Introduction to Network Security	Thomson (2007).

Course has focus on : Employability

Websites of Interest :
1. https://www.pearsonhighered.com/assets/hip/us/hip_us_pearsonhighere d/preface/0132775069.pdf
2. http://faculty.mu.edu.sa/public/uploads/1360993259.0858Cryptography%20and%20Network%20Security%2 0Principles%20and%20Practice,%205th %20Edition.pd

Co-curricular Activities : Programming Contests, Hackathons & Quiz.

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M.Sc., (ComputerScience)Programme - III Semester

Course	Design & Analysis of Algorithms		
Course Code	20CS3T3	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours /	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

Course Objective: The objective of this course is to develop proficiency in *Problem Solving and Programming*, To *Perform Analysis of various Algorithms in regard to Time and Space Complexity,* Gain *good understanding of Applications of Data Structures*, To develop a base for *Advanced Study* in *Computer Science*, To apply *Design Techniques* to solve different types of problems as per their *Complexity* and Develop *ability to segregate NP- Hard and NP-Complete problems.*

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

CO1 : Understand *Basic Ideas* about *Analysis of Algorithms and the Concept of Data Structures*.

CO2 : Know *Divide and Conquer ,Greedy Methods* and *Solving Various Problems* by applying them. **CO3 :** Apply *Dynamic Programming Method* and *Basic Traversal and Search Techniques* to solve variousProblems.

CO4 : Understand *Backtracking* and *Branch and Bound* Techniques to Design Algorithms.

CO5 : Categorize *NP-Hard* and *NP-Complete* Problems.

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction:** What is Algorithm, Algorithm Specification Pseudo code Conventions, Recursive Algorithms, Performance Analysis: Space Complexity Time Complexity, Asymptotic Notation, Performance Measurement, Randomized Algorithms: Basics of Probability Theory, Randomized Algorithms Identifying the Repeated Element, Primality Testing: Advantages and Disadvantages. **Elementary Data Structures:** Stacks and Queues, Trees: Terminology, Binary Trees, Dictionaries: Binary Search Trees, Priority Queues, Heaps , Heapsort , Sets and Disjoint Set Union: Introduction-Union and Find Operations, Graphs: Introduction, Definitions, graph representations.	10
II	**Divide-and-Conquer:** General Method, Defective Chess Board, Binary Search, Finding Maximum and Minimum, Merge Sort, Quick Sort, Selection Problem, Strassen's Matrix Multiplication, Convex Hull: Some Geometric Primitives, The Quick Hull Algorithm, Graham's Scan, An O(nlogn) Divide and Conquer Algorithm. **The Greedy Method:** The General Method, Container Loading, Knapsack Problem, Tree Vertex Splitting, Job Sequencing with Deadlines, Minimum Cost Spanning Trees: Prim's Algorithm, Kruskal's Algorithm, Optimal Storage on Tapes, Optimal Merge Patterns, Single Source Shortest Paths.	14
III	**Dynamic Programming:** The General Method, Multi Stage Graphs, All Pairs Shortest Paths, Single Source Shortest Paths, Optimal Binary Search Trees, String Editing -0/1 Knapsack, Reliability Design, The Traveling Sales Person Problem, Flow Shop Scheduling. **Basic Traversal and Search Techniques:** Techniques for Binary Trees, Techniques for Graphs: Breadth First Search and Traversal-Depth First Search, Connected Components and Spanning Trees, Bi-Connected Components and DFS.	17
IV	**Backtracking:** The General Method, The 8-Queens Problem, Sum of Subsets, GraphColoring, Hamiltonian Cycles, Knapsack Problem. **Branch and Bound :** The Method: Least Cost Search, The 15 Puzzle Control Abstractionsfor LC Search, Bounding, FIFO Branch and Bound , LC Branch and Bound, 0/1 Knapsack Problem, LC Branch and Bound Solution, FIFO Branch and Bound Solution, TravelingSales person.	11
V	**NP-Hard and NP-Complete Problems:** Basic Concepts: Non Deterministic Algorithms, The Classes NP Hard and NP Complex, Cook's Theorem, NP Hard Graph Problems, Clique Decision Problem, Node Cover Decision Problem Chromatic Number Decision Problem, Directed Hamiltonian Cycle, Traveling Sales Person Decision Problem, AND/OR Graph Decision Problem, NP-Hard Scheduling Problems, Scheduling Identical Processors, Flow Shop Scheduling, Job Scheduling, NP-Hard Code Generation Problems, Code Generation With Common Sub Expressions, Implementing Parallel Assignment Instructions, Some Simplified NP-Hard Problems.	8

Prescribed Text Book			
S.No	Author	Title	Publisher
1	Sartaj Sahni	Fundamentals of Computer Algorithms	Second Edition, Universities Press(2008)

Course	Data Mining Techniques		
Course Code	20CS3T4	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours /	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

Course Objective:

To understand and gain knowledge on *Basic Concepts*, *Applications*, Techniques of Data Mining, *Data Warehouse Architecture* and its *Components*, *Schemas*, *Different OLAP Operations*, *Characterize The Kinds of Patterns that can be discovered by Association Rule Mining*, *Data Classification and Prediction Techniques, Identify the Similarities among the data Using Clustering Algorithms* and *Outlier Analysis*.

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

CO1: Understand the *Basics of Data Mining* and *Data Pre-Processing Techniques*.

CO2: Aware of constructing the *Data Warehouse*, OLAP and relevant *Data Model Concepts*.

CO3: Understand the *Frequent Itemset Mining Methods* and Different Levels in Association Rules.

CO4: Understand the *Basic Concepts in Classification* and *Advanced Classification Methods* by implementing *Various Algorithms*.

CO5: Find the similarities among the data using *Clustering Algorithms* and *Outlier Analysis*.

	Syllabus	
Unit	**Learning Units**	**Lecture Hours**
I	**Introduction:** What is Data mining?, What Kind of Data can be Mined, What kinds of Patterns can be Mined, Major Issues in Data Mining**.** **Data Preprocessing:** Data Preprocessing : An Overview, Data Cleaning, Data Integration, Data Reduction-Overview of Data Reduction Strategies, Attribute Subset Selection, Regression and Log Linear Models, Histograms and Clustering, Data Transformation : Data Transformation Strategies Overview, Data Transformation by Normalisation, Discretization by Binning.	12
II	**Data Warehousing and OLAP:** Data Warehouse : Basic Concepts, What Is a Data Warehouse?, Difference between Operational Database Systems and Data Warehouses, Why have a separate Data Warehouse?, Data Warehousing : A Multiered Architecture, Data Warehouse Models, Extraction, Transformation and Loading, Metadata Repository, Data Warehouse Modeling : Data Cube and OLAP-A Multidimensional Data Mode-From Tables and Spreadsheets to Data Cubes, Stars, Snowflakes and Fact Constellations : Schemas for Multidimensional Data Models , Dimensions : The Role of Concept Hierarchies, Measures: their categorisation and computation, Typical OLAP Operations in the Multidimensional Data Model, A Starnet Query Model for Querying Multidimensional Databases.	12
III	**Mining Frequent patterns, Associations:** Basic Concept, Market Basket Analysis : A Motivational Example, Frequent Item Sets, Closed Item Sets and Association Rules, Frequent Item Set Mining Methods. **Advanced Pattern Mining:** Pattern Mining : A Road Map, Pattern Mining in Multilevel, Multidimensional Space, Mining Multilevel Association Rules, Mining Multi Dimensional Associations, Mining Quantitative Association Rules.	12
IV	**Classification: Basic Concepts:** What is Classification?, General Approaches to Classification, Decision Tree Induction, Attribute Selection Measures, Tree Pruning, Scalability and Decision Tree Induction, Bayes Classification Methods, Bayes Theorem, Navie Bayesian Classification. **Classification: Advanced Methods:** Bayesian Belief Networks, Concepts and Mechanisms, Training Bayesian Belief Networks, Classification by Back Propagation.	12
V	**Cluster Analysis Introduction:** What is Cluster Analysis?, Requirements for Cluster Analysis, A Partitioning Methods : K-Means, K-Medoid, Hierarchical Methods :Agglomerative versus Divisive Hierarchical Clustering, Distance Measures inAlgorithmic Methods, BRICH : Multiphase Hierarchical Clustering using Clustering Feature Trees, Chameleon Hierarchical Clustering, Density Based Methods : DBSCAN. **Outlier Detection:** What is Outliers Analysis?, Types of Outliers, Challenges of Outlier Detection.	12

A.G & S.G Siddhartha Degree College of Arts & Science, Vuyyuru521165.

(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (ComputerScience) Programme – II Semester

Course	Computer Networks		
Course Code	**22CS2T1**	Course Delivery Method	Class Room /
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

Course Description and Purpose:
Computer Networks is a course that will exemplifies basic concepts of *Computer Networks*, *Functionality of Layered Architecture*, *Error Correction and Detection Code* and *Various Protocols used in Layers and Protocols*, *Functionality of Medium Access Control Sub Layer*, *Various Routing Strategies used in inter networking using IPAddresses*, *Different Services* and *Protocols of Transport Layer* and *Various Application Layer Protocols* used over the internet.

Course Objectives:
This course will help the students t o understand and learn importance of *Protocols in a Network*, *The usage of the Protocols in Layered Architecture* and brief information of functionality of all the *Five Layers and their Protocols*.

Specific objectives include:
- To understand functionality of *Layered Architecturee*.
- To understand Ethernet, *Bluetooth and Data Link Layer Switching.*
- To learn Network Layer Design issues and Routing Algorithm used.
- To learn *Transport Services and TCP and UDP*.
- To understand the Protocols and services of *Applications Layer*.

Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:
CO1: Understand *Functionality of Layered Architecture*, *Error Correction and Detection Codes* and *Various Protocols used in Layers*.
CO2: Understand functionality of *Medium Access Control* Sub Layer.
CO3: Understand the various *Routing Strategies* used in internet working using *IP Addresses*.
CO4: Understand different Services and Protocols of *Transport Layer*.
CO5: Understand the various *Application Layer Protocols* used over internet.

Unit	Learning Units	Lecture Hours
I	**Introduction:** Uses of Computer Networks: Business Application, Home Applications, Mobile Users, Social Issues, Connection Oriented and Connectionless Services, Service Primitives, The relationship of Services to Protocols, *Reference Models***:** The OSI Reference Model, The TCP/IP Reference Model, A Comparison of OSI and TCP/IP Reference Model. **Physical Layer:** ALOHA, CSMA, CSMA/CA **Data Link Layer:** *Data Link Layer Design Issues*: Services Provided to the Network Layer, Framing, Error Control, Flow Control, *Error Correcting Codes*, *Error Detecting Codes*, *Elementary Data Link Protocols*: An Utopian Simplex Protocol, A Simplex *Stop and Wait* Protocol, A Simplex Protocol for a Noisy Channel, *Sliding Window Protocols***:** A One Bit Sliding Window Protocol, A Protocol Using Go Back N, A Protocol using Selective Repeat.	**12 Hours**
II	**The Medium Access Control Sub Layer:** *Ethernet*: Ethernet Cabling, Manchester Encoding, The Ethernet MAC sub layer Protocol, The Binary Exponential Backoff Algorithm, *Bluetooth*: Bluetooth Architecture, Bluetooth Applications, The Bluetooth Protocol Stack, The Bluetooth Radio Layer, The Bluetooth Link Layers, The Bluetooth Frame Structure, *Data Link Layer Switching*: Uses of Bridges, Learning Bridges ,Spanning Tree Bridges, Remote Bridges, Repeaters, Hubs, Bridges, Switches, Routers and Gateways, Virtual LANs.	**12 Hours**
III	**The Network Layer:** *Network Layer Design Issues*: Store and Forward Packet Switching, Services provided to the Transport Layer, Implementation of Connectionless Services, Implementation of Connection Oriented Services, Comparison of Virtual Circuit and Datagram subnets. *Routing Algorithms* **:** The Optimality Principle, Shortest Path Routing, Flooding , Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast Routing, Multicast Routing, Routing forMobile Hosts *The Network Layer in the Internet***:** The IP Version 4 Protocol, IP Address, IPV6 Features and Advantages.	**12 Hours**
IV	**The Transport Layer:** *The Transport Service***:** Services provided to the Upper Layers, Transport Services Primitives, Berkeley Sockets. *Elements of Transport Protocols*: Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery. **The Internet Transport Protocols:** Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modelling TCPConnection Management, TCP Sliding Window, TCP Congestion Control, Comparison of TCP and UDP.	**12 Hours**
V	**Wireless TCP:** Classical improvement in WTCP. **The Application Layer:** *DNS:* The Domain Name System: The DNS Name Space, Resource Records, Name Servers. *Electronic Mail*: Architecture and Services, The User Agent, Message Formats, Message Transfer, Final Delivery. **The** *World Wide Web*: Architecture Overview, Static Web Pages, Dynamic Web Pages**.** *Streaming Audio and Video*: Digital Audio, Digital Video, Streaming Stored Media, Streaming Live Media, Real Time Conferencing.	**12 Hours**

Reference Text books:

1. Andrew S. Tanenbaum, ComputerNetworks, Sixth Edition, Pearson, 2021
2. Andrew S. Tanenbaum, ComputerNetworks, Fifth Edition, Pearson, 2011
3. James F.Kurose, Keith W Ross, Computer Networking, 3rd Edition, Pearson Edition
4. Michael A. Gallo, William M. Hancock, Data Communications and Networking, 4th Edition, TMH

Course	Data Structures		
Course Code	22CS2T2	Course Delivery Method	Class Room /
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

Course Description and Purpose:

Data Structures is a course that illustrates *Elementary Data Organization*, *Data Structure Operations*, and *Algorithms*, *Arrays*, *Matrices*, *String Processing*, *Stack*, *Queues*, *Linked List*, *Trees*, *Heap Sort*, *Multi-way Search Trees*, *B-Tree*, *B+-Trees*, *Graphs Algorithms*, *Elementary Graph Algorithms*, *Sorting* and *Searching Techniques*.

Course Objectives:

This course will help enable the students t o understand, learn and develop *Data Structure Operations and Algorithms*, *Arrays*, *Matrices*, *String Processing*, *Stack*, *Queues*, *Linked List*, *Trees*, *Heap Sort*, *Multi-way Search Trees*, *B-Tree*, *B+-Trees*, *Graphs Algorithms*, *Elementary Graph Algorithms*, *Sorting and Searching Techniques*.

Specific Objectives include:

▪ To understand *Data Structures*, *Data Structure Operations* and *Algorithms*, *Arrays*.
▪ To understand *String Processing, Stack, Queues and Linked List.*
▪ To learn the *Binary Tree, Binary Search Trees, AVL Trees, Heap*.
▪ To learn the *Multi-way Search Trees*, *B-Trees*, *B+-Trees*.
▪ To understand the *Graph Algorithms*, different *Sorting* and *Searching Techniques*.

Course Learning Outcomes:

At the end of this course the students should be able to:
CO1: Understand *Data Structures*, *Data Structure Operations and Algorithms*, *Arrays*.
CO2: Understand *String Processing, Stack, Queues and Linked List.*
CO3: Learn the Binary Tree, Binary Search Trees, AVL Trees, Heap.
CO4: Learn the *Multi-way Search Trees*, *B-Trees*, *B+-Trees*.
CO5: Understand the *Graph Algorithms*, different *Sorting* and *Searching Techniques*.

Unit	Title	Lecture Hours
I	**Introduction and Overview:** Elementary Data Organization, Data Structures, Data Structure Operations, and Algorithms: Complexity, Time and Space Tradeoff Asymptotic Notations. Linear Arrays, Representation and Traversing Linear Arrays, Inserting and Deleting, Linear Search, Binary Search, Multidimensional Arrays, Pointer Arrays, Record Structures, Representation of records in memory, Parallel Arrays, Matrices, Sparse Matrices.	**12 Hours**
II	**String Processing:** Pattern Matching Algorithms. **Stacks:** Stacks, Array representation, Linked List representation, Evaluation of Arithmetic Expressions, Quick Sort, Recursion, Towers of Hanoi. **Queues:** Linked representation of Queues, Deques, Priority Queues. **Linked Lists:** Representation, Traversing, Searching, Memory Allocation: Garbage Collection,Insertion, Deletion, Header Linked Lists, Two Way Lists.	**12 Hours**
III	**Trees:** Binary Trees, Representing and Traversing Binary Trees, Traversal Algorithms using Stacks, Binary Search Trees, Searching, Insertion and Deletion in Binary Search Trees, AVL Search Trees, Insertion and Deletion in AVL Trees. **Heap:** Heap Sort, Huffman's Algorithms, General Trees.	**12 Hours**
IV	**Multi-way Search Trees:** M-Way Search Trees, Definition and Properties, Searching an M-Way Search Tree, B-Trees, Definition and Properties, Number of Elements in a B-Tree, Insertion into B-Tree, Deletion from a B-Tree, B+-Tree Definition, Searching a B+-Tree, Insertion into B+-Tree, Deletion from a B+-Tree.	**12 Hours**
V	**Graphs:** Graphs Algorithms, Elementary Graph Algorithms: Topological Sort, Single Source Shortest Path Algorithms:Dijkstra's, Bellman-Ford, All Pairs Shortest Paths : Floyd Warshall's Algorithm. **Sorting and Searching:** Insertion Sort, Selection Sort, Merging, Merge Sort, Radix Sort, Searching and Data Modification, Hashing.	**12 Hours**

Reference Textbooks:
1. Seymour Lipschutz, Data Structures, Mc Graw Hill (Schaums Outlines), Revised First Edition, 2014.
2. Seymour Lipschutz, Theory and Problems of Data Structures, Mc Graw Hill (Schaums Outlines), Paperback, 2017.
3. John R Hubbard, Second Edition, Data Structures with Java, Mc Graw Hill (Schaums Outlines), 2009.
4. Robert Lafore, Data Structures & Algorithms in Java, Second Edition, Pearson Education, 2017.
5. Fundamentals of Data Structures in C, Second Edition, Horowitz, Sahani, Anderson-freed, Universities Press, 1993.
6. Data Structures: A Pseudocode Approach, Richard F Gilberg, Behrouz A Forouzan, Cengage, 2004

A.G & S.G Siddhartha Degree College of Arts & Science, Vuyyuru – 521165.

(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (Computer Science) Programme – II Semester

Course	Web Technologies		
Course Code	22CS2T3	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours /	4	Semester End Exam	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:**2020-**	Year of Offering:2021-	Year of Revision:2021-	Percentage of Revision:

Course Description and Purpose:
Web Technologies (22CA2T3) is a course that illustrates about *WWW*, *HTML*, Write code in *JavaScript & DHTML*, *Designing of XML Files*, Install and use *Servlets* and *PHP*, *Programming in JSP*, *Establish Database Connectivity & Form Validations using C#*, *Basic knowledge of Node JS*, *Express & Spring Boot*, *Creating AJAX form validations*.

Course Objectives: The course will help the students to understand, learn and build *WWW*, *HTML*, *Write code in JavaScript & DHTML*, *Designing of XML Files*, *Install and use Servlets and PhP*, *Programming in JSP*, *Establish Database Connectivity & Form Validations using C#*, *Basic knowledge of Node JS*, *Express & Spring Boot*, *Creating AJAX form validations*.

Course Objectives:
▪ To understand the concepts of WWW including *Browser and HTTP Protocol* and various *HTML Tags* and use them to develop the user friendly web pages.
▪ To use the *JavaScript* and define the CSS with its types to develop the *Dynamic Web Pages*.
▪ Students will be able to and develop the *Modern Web Pages* using the *XML Elements* and Servlets with different layouts as per need of applications.
▪ Able to develop *Server Side Scripting* with PHP and JSP to generate the Web Pages dynamically using the Database Connectivity & C# Database Connectivity with Form Validations.
▪ Able to develop *Interactive Forms* for Web Applications using *Node JS*, *Express*, *Spring Boot & AJAX*.

Course Outcomes:
On successful completion of this course, the students:
CO1: Able to understand the concepts of WWW including *Browser* and *HTTP Protocol* and various *HTML Tags* and use them to develop the user friendly web pages.
CO2: Able to use the *JavaScript* and define the CSS with its types to develop the *Dynamic Web Pages*.
CO3: Students will be able to develop the *Modern Web Pages* using the *XML Elements* and Servlets with different layouts as per need of applications.
CO4: Able to develop *Server Side Scripting* with PHP and JSP to generate the Web Pages dynamically using the Database Connectivity C# Database Connectivity with Form Validations.
CO5: Able to develop *Interactive Forms* for Web Applications using *Node JS, Express*, *Spring Boot & AJAX*.

Unit	Learning Units	LectureHours
I	**Introduction:** What is Internet, History of Internet, Internet Services and Accessibility, Uses of the Internet, Protocols, **Web Concepts:** The Client/Server Model, Retrieving Data from the Web, How the Web Works?, Web Browsers, Searching information on the Web, Internet Standards. **HTML:** Outline of an HTML Document, **Head Section Body Section:** Headers, Paragraphs, Text Formatting, Linking, Internal Linking, Embedded Images, Lists, Tables, Frames, Other Special Tags and Characters, HTML Forms.	**12 Hours**
II	**Java Script:** Introduction to Scripting, Control Statements I, Control Statements II, Functions, Arrays, Objects, Document Object Model, Events. **Dynamic HTML (DHTML):** Introduction, Cascading Style Sheets (CSS), Coding CSS, Properties of Tags, Property Values, Other Style Properties, In Line Style Sheets, Embedded Style Sheets, External Style Sheets, Grouping - Inheritance, Class as Selector, ID as Selector, Contextual Selector, Pseudo Classes and Pseudo Elements, Positioning - Backgrounds, Element Dimensions, DHTML Document Object Model and Collections, Using the Collections All, Moving Object around the Document, Event Handling, Assigning Event Handlers, Event Bubbling, Filters and Transition Filters, Transitions, Data Binding, Using Tabular Data Control, Sorting Data, Dynamic Sorting, Filtering.	**12 Hours**
III	**XML:** Introduction, HTML vs. XML, Syntax of XML Document, XML Attributes, Use of elements vs. Use of Attributes, XML Validation, Well Formed XML Documents, Valid XML Documents, XML DTD: Internal DTD, External DTD, The Buildings blocks of XML Documents, **DTD Elements** : Declaring an Element, Empty Elements, Elements with Data, Elements with Children, Wrapping, Declaring only one Occurrence of the Same Elements, Declaring Minimum one Occurrence of the Same Element, Defining Zero or One Occurrence of the Same Element, Declaring Mixed Content, **DTD Attributes**: Declaring Attributes, Default Attribute Value, Implied attribute, required attribute, fixed attribute value, enumerated attribute values, DTD Entries, DTD Validation, XSL, XSL Transformation, XML NameSpaces, XML Schema. Servlets: Introduction, Advantages of Servlets over CGI, Installing Servlets, The Servlet Life Cycle, Servlets API, A Simple Servlet, Handling HTTP Get Requests, Handling HTTP Post Requests, Cookies, Session Tracking, Multi Tier Applications using Database Connectivity, Servlets Chaining.	**12 Hours**
IV	**PHP:** Introduction, PHP Basics, String Processing and Regular Expressions, Form Processing and Business Logic, Connecting to a Database, Using Cookies, Dynamic Content, Operator Precedence Chart. **Java Server Pages (JSP):** Introduction, Advantages of JSP, Developing first JSP, Components of JSP, Reading Request Information, Retrieving the Data Posted from a HTML File to a JSP File, JSP Sessions, Cookies, Disabling Sessions. **Database Connectivity & Form Validations using C#:** Database Connectivity using C#.Net, Form Validations (Name Validation, Integer Validation, Floating Point Validation, Email Validation, Combo Box Validation). **Spring Boot:** Introduction to Spring Boot, Spring Initializer, Maven, Gradel, Class Path Dependencies Creating Executable Jar File.	**12 Hours**
V	**Getting Started with Node:** Getting Node, Using the Terminal, Editors, npm, A Simple Webserver with Node (Hello World, Event Driven Programming, Routing, Serving Static Resource). **Saving Time with Express:** Scaffolding, Initial Steps (Views and Layouts, Static Files and Views, Dynamic Content in Views). **Form Handling:** Sending Client Data to Server, HTML Forms. Encoding, Approaches in Form Handling, Form Handling with Express, Handling AJAX Forms-File Uploads, jQuery File Upload.	**12 Hours**

Reference Books:

1. N.P.Gopalan, J.Akilandeswari, Web Technologies - A Developer's Perspective, PHI(2008)
2. Harvey M.Deitel and Paul L. Deitel, Internet and World Wide WebHow To Program, Prentice Hall, 5th Edition.
3. Ethan Brown, Web Development with Node & Express, O'Reilly, First Edition, 2014.

A.G & S.G Siddhartha Degree College of Arts & Science, Vuyyuru – 521165.

(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (ComputerScience)Programme - II Semester

Course	Software Engineering		
Course Code	22CS2E1	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:**2020-**	Year of Offering:2021-	Year of Revision:2021-22	Percentage of Revision:

Course Description and Purpose:
Software Engineering (22CS2E1) is a course that illustrates Process Models, Agile Development, Core Principles, Requirements Modeling, Data Modeling, Software Quality Assurance, Software Testing Strategies, Testing Conventional Applications, Project Management Concepts, Process and Project Metrics, Formal Modeling and Verification and Estimation for Software Project.

Course Objectives: The course will help the students to understand, learn and build Process Models, Agile Models, Core Principles, Requirement Models, Data Models, Software Quality Assurance Procedures, Software Testing Strategies, Strategies to Test Conventional Applications, Project Management Concepts, Process and Project Metrics, Formal Modeling and Verification and Models to estimate Software Projects.

Specific objectives include:
- *To understand various Software Engineering Methods, Practices, Process Models and Agile Development Strategies.*
- To understand and apply *Core Principles*, *Requirements & Modeling* Concepts.
- To understand and apply different *Software Testing Approaches* and various aspects of *Software Quality Assurance*.
- To understand and apply *Process & Project Management* Concepts.
- To understand and apply *Software Estimates for Projects* & apply *Formal Methods Modeling*.

Course Learning Outcomes:
Upon successful completion of the course, the student will be able to:
CO1: Understand various *Software Engineering Methods*, *Practices*, *Process Models* and *Agile Development Strategies.*
CO2: Understand and apply *Core Principles*, *Requirements & Modeling* Concepts.
CO3: Understand and apply different *Software Testing Approaches* and various aspects of *Software Quality Assurance*.
CO4: Understand and apply *Process & Project Management* Concepts.
CO5: Understand and apply *Software Estimates for Projects* & apply *Formal Methods Modeling*.

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**Software and Software Engineering:** The Nature of Software: Defining Software, Software Application Domains, Legacy Software, The Unique Nature of Web Apps, Software Engineering, The Software Process, Software Engineering Practices: The Essence of Practice, General Principles, Software Myths. **Process Models:** A Generic Process Model: Defining a Framework Activity, Identifying a Task Set, Process Patterns, Process Assessment and Improvement, Prescriptive Process Models: The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Concurrent Models, A Final Word on Evolutionary Processes, Specialized Process Models: Component-Based Development, The Formal Methods Model, Aspect-Oriented Software Development, The Unified Process: A Brief History, Phases of the Unified Process, Personal and Team Process Models: Personal Software Process (PSP), Team Software Process (TSP). **Agile Development**: What Is Agility, Agility and the Cost of Change, What Is an Agile Process: Agility Principles, The Politics of Agile Development, Human Factors, Extreme Programming (XP): XP Values, The XP Process, Industrial XP, The XP Debate, Other Agile Process Models: Adaptive Software Development (ASD), Scrum, Dynamic Systems Development Method (DSDM), Crystal, Feature Driven Development (FDD), Lean Software Development (LSD), Agile Modeling (AM), AgileUnified Process (AUP).	12 Hours
II	**Principles that Guide Practice: Core Principles:** Principles That Guide Process, Principles That Guide Practice, Principles That Guide Each Framework Activity: Communication Principles, Planning Principles, Modeling Principles, Construction Principles, Deployment Principles. **Requirements Modeling: Scenarios, Information, and Analysis Classes:** Requirements Analysis: Overall Objectives and Philosophy, Analysis Rules of Thumb, Domain Analysis, Requirements Modeling Approaches, Scenario-Based Modeling: Creating a Preliminary Use Case, Refining a Preliminary Use Case, Writing a Formal Use Case, UML Models That Supplement the Use Case: Developing an Activity Diagram, Swim lane Diagrams. **Data Modeling Concepts:** Data Objects, Data Attributes, Relationships, Class-Based Modeling: Identifying Analysis Classes, Specifying Attributes, Defining Operations, Class-Responsibility- Collaborator (CRC) Modeling, Associations and Dependencies, Analysis Packages.	12 Hours
III	**Software Quality Assurance:** Background Issues, Elements of Software Quality Assurance, SQA Tasks, Goals, and Metrics: SQA Tasks, Goals, Attributes, and Metrics, Formal Approaches to SQA, Statistical Software Quality Assurance: A Generic Example, Six Sigma for Software Engineering, Software Reliability : Measures of Reliability and Availability, Software Safety, The ISO 9000 Quality Standards, The SQA Plan. **Software Testing Strategies:** A Strategic Approach to Software Testing : Verification and Validation, Organizing for Software Testing, Software Testing Strategy-The Big Picture, Criteria for Completion of Testing, Strategic Issues, Test Strategies for Conventional Software: Unit Testing, Integration Testing, Test Strategies for Object-Oriented Software: Unit Testing in the OO Context, Integration Testing in the OO Context, Test Strategies for Web Apps, Validation Testing: Validation-Test Criteria, Configuration Review, Alpha and Beta Testing, System Testing: Recovery Testing, Security Testing, Stress Testing, Performance Testing, Deployment Testing, The Art of Debugging: The Debugging Process, Psychological Considerations, Debugging Strategies, Correcting the Error **Testing Conventional Applications:** Software Testing Fundamentals, Internal and External Views of Testing, White-Box Testing, Basis Path Testing: Flow Graph Notation, Independent Program Paths, Deriving Test Cases, Graph Matrices, Control Structure Testing: Condition Testing, Data Flow Testing, Loop Testing, Black-Box Testing: Graph-Based Testing Methods, Equivalence Partitioning, Boundary Value Analysis, Orthogonal Array Testing.	12 Hours

IV	**Project Management Concepts:** The Management Spectrum: The People, The Product, The Process, The Project, People: The Stakeholders, Team Leaders, The Software Team, Agile Teams, Coordination and Communication Issues, The Product: Software Scope, Problem Decomposition, The Process: Melding the Product and the Process, Process Decomposition, The Project, The W5HH Principles. **Process and Project Metrics:** Metrics in the Process and Project Domains: Process Metrics and Software Process Improvement, Project Metrics, Software Measurement: Size-Oriented Metrics, Function-Oriented Metrics, Reconciling LOC and FP Metrics, Object-Oriented Metrics, Use-Case– Oriented Metrics, Web App Project Metrics, Metrics for Software Quality: Measuring Quality, Defect Removal Efficiency.	**12 Hours**
V	**Formal Modeling And Verification:** The Cleanroom Strategy, Functional Specification: Black-Box Specification, State-Box Specification, Clear-Box Specification, Cleanroom Design: Design Refinement, Design Verification, Cleanroom Testing: Statistical Use Testing, Certification, Formal Methods Concepts, Applying Mathematical Notation for Formal Specification, Formal Specification Languages: Object Constraint Language (OCL), The Z Specification Language. **Estimation for Software Projects:** Resources: Human Resources, Reusable Software Resources, Environmental Resources, Software Project Estimation, Decomposition Techniques: Software Sizing, Problem-Based Estimation, An Example of LOC-Based Estimation, An Example of FP-Based Estimation, Empirical Estimation Models: The Structure of Estimation Models, The COCOMO II Model, The Software Equation, Estimation for Object-Oriented Projects.	**12 Hours**

Case Studies:
- Draw example for Process Pattern when requirements are uncertain.
- Draw UML use case diagram for Safehome Security Function.
- Draw UML Activity Diagram for Access camera surveillance via the Internet - display camera views function.
- Draw UML Swimlane Diagram for Access camera surveillance via the Internet - display camera views function.
- Draw UML Class Diagram for Floor Plan.
- Draw UML Package for specifying Environment, Characters of the Game and Rules of the Game.
- Draw Level 1 DFD for Safehome Security Function
- Draw State diagram for Safehome Security Function
- Draw Sequence Diagram (partial) for the Safehome Security Function
- A UML Deployment Diagram for Safehome Security Function.
- Draw   Flow   Graph for Flow Chart and find the Cyclomatic Complexity.
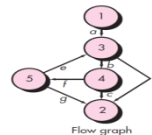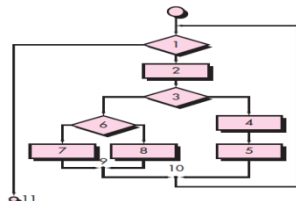
Flow graph

- Draw the Graph Matrix for the Flow Graph
- Draw Generalization diagram by specifying Structural Constraint.
- Specify sample (a) Project Metrics (b) Product Metrics
- Specify (i) Decision Table (ii) Decision Tree in Block Box Testing
- Draw the Block Diagram for Block Handler and also specify the logic using Object Constraint Language (OCL)
1. No block will be marked as both unused and used.
2. All the sets of blocks held in the queue will be subsets of the collection of currently used blocks
3. No elements of the queue will contain the same block numbers.
4. The collection of used blocks and blocks that are unused will be the total collection of blocks that make up files.
5. The collection of unused blocks will have no duplicate block numbers.
6. The collection of used blocks will have no duplicate block numbers.
7. Using Z Specification Language describes the state of the block handler and the data invariant:

Reference Text Books:
1. Roger S Pressman, Software Engineering - A Practitioner's Approach, Ninth Edition, McGraw - Hill, A Business Unit of The McGraw-Hill Companies, Inc., 2020.
2. Roger S Pressman, Software Engineering - A Practitioner's Approach, Seventh Edition, McGraw - Hill, A Business Unit of The McGraw-Hill Companies, Inc., 2010.
3. Sommerville, Software Engineering, 7th Edition, Pearson Education, 2004.
4. S.A.Kelkar, Software Engineering - AConcise Study, PHI, January 2007.
5. Waman, Software Engineering, TMH, June 2004.
6. AH Behforooz and Frederick J.Hudson, Software Engineering Fundamentals, Oxford, 2008.

A.G & S.G Siddhartha Degree College of Arts & Science, Vuyyuru – 521165.
(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (Computer Science) Programme - IV Semester

Course	BIG DATA ANALYTICS		
Course Code	20CS4T1	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

Course Outcomes:
On successful completion of this course, the students:
- Understand basics of Big Data. (CO1)
- Gain knowledge on *Big Data Analytics*. (CO2)
- Be familiar with *HDFS , and hadoop environment*. (CO3)
- Have knowledge on Mongo DB. (CO4)
- Gain knowledge on PIG and Jaspersoft. (CO5)

Unit	Learning Units	Lecture Hours
I	**Types of Digital data:** Classification of Digital Data. Introduction to Big Data: Characteristics of data, Evolution of Big Data, Definition of big data, Challenges with Big data, What is Big Data?, Why Big Data?, Traditional Business Intelligence versus Big Data, A typical Data Warehouse Environment, A typical Hadoop Environment.	12
II	**Big data analytics:** What is Big Data Analytics?, Top challenges facing Big Data Analytics, Why Big Data Analytics is important?, Data Science, Terminologies used in Big Data Environments.	10
III	**The Big Data Technology Landscape:** NoSQL, Hadoop, Why Hadoop?, Why not RDBMS?, RDBMS versus Hadoop, Hadoop Overview, HDFS, Processing Data with Hadoop, Interacting with Hadoop Ecosystem.	14
IV	**Introduction to MongoDB:** What is MongoDB?, Why MongoDB?, Terms used in RDBMS and MongoDB, Data types in MongoDB, MongoDB query language. **Introduction to Mapreduce programming:** Introduction, Mapper, Reducer,Combiner, Partitioner, Searching, Sorting and Compression.	10
V	**Introduction to Pig:** What is Pig?, Pig on Hadoop, Pig Latin Overview, Data Types in Pig, Running Pig, Execution Modes of Pig, HDFS commands, Relational Operators, Eval function, Complex Data Types, User-Defined Fucntions, Parameter Substitution, Word Count Example using Pig. **JasperReport using Jaspersoft:** Introduction to Jasper Reports, Connecting to MongoDB NoSql Database.	14

Prescribed Text Book:
1. Seema Acharya and Subhashini Chellappan, Big Data and Analytics, Wiley India Pvt. Ltd., 2016

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M.Sc., (Computer Science) Programme - IV Semester

Course	ARTIFICIAL INTELLIGENCE WITH MACHINE LEARNING		
Course Code	20CS4T3	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours /	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-	Year of Offering:2021-	Year of Revision:2021-22	Percentage of Revision:

Course Outcomes:

On successful completion of this course, the students:

1. Understand the Basic Concepts of Operating System, Operating System Structure and Process Concept.(CO1)
2. ApplyingconceptsofThreads,ProcessSynchronization&CUPScheduling.(CO2)
3. Understand Deadlock, Main Memory & Virtual Memory.(CO3)
4. Explain Mass Storage Structure, File System Interface & File System Implementation.(CO4)
5. Understanding on I/O Systems, Protection & Security.(CO5)

Unit	Learning Units	Lecture Hours
I	**Introduction**- Association, Supervised Learning – Classification – Regression, Unsupervised Learning, Reinforcement Learning.	12
II	**Decision Tree** - Divide and Conquer - Classification Trees (ID3, CART, C4.5) - Best Split - Regression Trees - Pruning Trees - Rule Extraction from Trees - Learning Rules - Multivariate Trees, Naive Bayes Classifier. **Neural networks** - Perceptron - Training a Perceptron: Regression - Learning Boolean AND – XOR - Multilayer Perceptrons – Backpropagation - Multiple Hidden Layers - and support vector machines.	10
III	**Clustering** - Semiparametric Density Estimation- Mixture Densities - Classes vs. Clusters - k-Means Clustering - Expectation-Maximization (EM) - Hierarchical Clustering - Agglomerative Clustering. **Dimensionality Reduction** - Feature Selection vs Extraction - Subset Selection - Principal Components Analysis (PCA) - Factor Analysis - Multidimensional Scaling - Linear Discriminant Analysis - Fisher's Linear Discriminant - Isomap, kernel methods.	14
IV	**Parametric learning** - Maximum Likelihood Estimation - Gaussian (Normal) Distribution - Bias and Variance - Bayes' Estimator - Parametric Classification - Regression - Linear Regression - Polynomial Regression - Bayesian Model Selection, **Nonparametric learning** - Density Estimation - Kernel Estimator - k-Nearest Neighbour Estimator.	10

V	**Reinforcement learning** – Introduction - Single State: K-armed Bandit - Model-Based Learning - Value Iteration - Policy Iteration - Temporal Difference Learning - Exploration Strategies - Deterministic Rewards and Actions - Nondeterministic Rewards and Actions - Q-learning - Sarsa - Eligibility Traces - The Tiger Problem **Combining Multiple Learners –** Rationale – Voting - Fixed Combination Rules Error-Correcting Output Codes – Bagging – AdaBoost - Mixture of Experts Stacking - Fine-Tuning an Ensemble – Cascading - Combining Multiple Sources.	14

Prescribed Text Book

	Author	Title	Publisher
1	Ethem Alpaydın	Introduction to Machine Learning, Second Edition	The MIT Press Cambridge, Massachusetts London, England.

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(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (Computer Science) Programme – IV Semester

Course	CLOUD COMPUTING		
Course Code	20CS4T4	Course Delivery Method	Class Room / Blended
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction:2020-	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision:

Course Outcomes:

On successful completion of this course, the students:

6. Understand the Basic Concepts of Operating System, Operating System Structure and Process Concept.(CO1)
7. ApplyingconceptsofThreads,ProcessSynchronization&CUPScheduling.(CO2)
8. Understand Deadlock, Main Memory & Virtual Memory.(CO3)
9. Explain Mass Storage Structure, File System Interface & File System Implementation.(CO4)
10. Understanding on I/O Systems, Protection & Security.(CO5)

Unit	Learning Units	Lecture Hours
I	**Era of Cloud Computing :** Getting to know the cloud - Peer-To-Peer, Client-Server, and Grid Computing – Cloud computing versus Client-server Architecture - Cloud computing versus Peer-To-Peer Architecture - Cloud computing versus Grid Computing - How we got to the Cloud - Server Virtualization versus cloud computing - Components of Cloud computing – Cloud Types – Cloud Computing Service delivery Models. **Introducing Virtualization :** Introducing Virtualization and its benefits – Implementation levels of Virtualization – Virtualization at the OS Level – Virtualization Structure – Virtualization Mechanisms – Open Source Virtualization Technology – Binary Translation with Full Virtualization – Virtualization of CPU, Memory and I/o Devices – Hardware support for Virtualization in Intex x86 Processor	12
II	**Cloud Computing Services:** Infrastructure as a Service – Platform as a Service Language and Pass – Software as a Service – Database as a Service. **Open Source Cloud Implementation and Administration:** Open-source Eucalyptus Cloud Architecture – Open-source Openstack Cloud Architecture.	10
III	**Application Architecture for Cloud:** Cloud Application Requirements – Recommendations for Cloud Application Architecture – Fundamental Requirements for Cloud Application Architecture – Relevance and use of Client-server architecture for Cloud Applications – Service oriented Architecture for Cloud Applications. **Cloud Programming:** Programming support for Google Apps Engine – Big Table as Google's NOSQL System – Chubby as Google Distributed Lock Service – Programming support for Amazon EC2 – Elastic Block Store (ESB).	14

IV	**Risks, Consequences and Costs for Cloud Computing :** Introducing Risks in Cloud Computing – Risk Assessment and Management – Risk of Vendor Lock-in Risk of Loss Control – Risk of Not Meeting Regulatory Compliances – Risk of Resource Scarcity – Risk in Multi Tenant Environment – Risk of Failure – Risk of Failure of Supply Chain – Risk of Malware and Internet attacks – Risk of In adequat SLA – Risk of Management of Cloud Resources – Risk of Network Outages – Risks in the Physical Infrastructure – Legal Risk due to Legislation – Risks with Software and Application Licensing – Security and Compliance Requirements in a Public Cloud – Direct and Indirect Cloud Costs – Calculating Total cost of Ownership for Cloud Computing – Cost Allocations in a Cloud . **AAA administration for clouds :** The AAA Model, Single Sign-on for Clouds – Industry Implementations for AAA- Authentication management in the Cloud – Authorization management in the Cloud .	10	
V	**Application Development for cloud :** Developing On-Premise Versus Cloud Applications – Modifying Traditional Applications for Deployment in the Cloud Stages during the development process of Cloud Application - Managing a Cloud Application – Using Agile Software Development for Cloud Applications Cloud Applications : What Not to do - Static code analysis for cloud applications – Developing Synchronous and Asynchronous Cloud Applications . **Mobile Cloud Computing :** Definition of Mobile Cloud Computing – Architecture of Mobile Cloud Computing – Benefits of Mobile Cloud Computing Mobile Cloud Computing Challenges.	14	

Prescribed Text Book			
	Author	Title	Publisher
1	Thomas Erl, Zaigham Mahmood, Ricardo	Cloud Computing - Concepts Technology and Architecture	Pearson
2	Raj Kumar Buyya, Christen vecctiola,S Tammarai selvi	Mastering Cloud Computing, Foundations and Application Programming	TMH

Reference Text Books			
	Author	Title	Publisher
1	Kailash Jayaswal, Jagannath Kallakurchi, Donald J. Houde Dr. Deven Shah	Cloud Computing, Black Book	Dreamtech press

Adusumilli Gopala krishnaiah & Sugar Cane Growers Siddhartha Degree

College ofArts & Science, Vuyyuru, Krishna District, Andhra Pradesh

(An Autonomous College in the Jurisdiction of Krishna University, Machilipatnam)

Accredited by NAAC with "A" GradeISO 9001:2015 Certified Institution

DEPARTMENT OF COMMERCE

HIGHLIGHTED SYLLABUS OF COMMERCE

2022-23

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability

Skill-Development

Entrepreneurship

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TITLE OF THE PAPER: Fundamentals of Accounting

Semester: I

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction :**Need for Accounting – Definition – Objectives, – Accounting Concepts and Conventions – GAAP - Accounting Cycle - Classification of Accounts and its Rules – Bookkeeping and Accounting - Double Entry Book-Keeping - Journalizing - Posting to Ledgers, Balancing of Ledger Accounts (including Problems).	15
II	**Subsidiary Books:** Types of Subsidiary Books - Cash Book, Three-column Cash Book- Petty Cash Book (including Problems).	15
III	**Trial Balance and Rectification of Errors:** Preparation of Trial balance - Errors – Meaning – Types of Errors – Rectification of Errors – Suspense Account (including Problems)	15
IV	**Bank Reconciliation Statement:** Need for Bank Reconciliation - Reasons for Difference between Cash Book and Pass Book Balances- Preparation of Bank Reconciliation Statement - Problems on both Favorable and Unfavorable Balance (including Problems).	15
V	**Final Accounts: Preparation of Final Accounts:** Trading account – Profit and Loss account – Balance Sheet – Final Accounts with Adjustments (including Problems).	15

Test Book Prefer:
1. Financial Accounting By: S.P.Jain& K.L. Narang. Kalyani Publishers – New Delhi.
Reference text books:
2. Financial Accounting – Himalaya Publishers
3. Financial Accounting – Pragthiprakesh Publishers

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TITLE OF THE PAPER: **Principles of Management**
Semester: I

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction of Management Definition** – Management - functions of management - principles of management - levels of management- Trends and Challenges of Management in Global Scenario.	15
II	**Planning Nature and purpose of planning** – Planning process - Types of plans - Objectives - Managing by objective (MBO) Strategies - Types of strategies	15
III	**Organizing** Nature and purpose of organizing - Organization structureFormal and informal groups organization - Line and Staff authority -Centralization and Decentralization - Delegation of authority	15
IV	**Motivation** Theories -Leadership Styles - Leadership theories - Communication - Barriers to effective communication.	15
V	**Controlling** Process of controlling - Types of control- Budgetary and non-budgetary, control techniques - Managing Productivity - Cost Control - Purchase Control-Maintenance Control - Quality Control	15

REFERENCES:
1. **Gupta, Sharma and Bhalla; Principles of Business Management; Kalyani Publications.**
2. **L. M. Prasad; Principles of Management; Sultan Chand and Sons, 6th edition.**
3. **Harold Kooriv& Heinz Weihrich "Essentia.1s of Management", Tala McGraw-Hill,1998**
4. **Joseph L Massie "Essentials of Management", Prentice Hall of India, (Pearson) Fourth Edition, 2003.**

(5) Principles of Management, By Tripathi, Reddy Tala Mcfrraw Hil

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TITLE OF THE PAPER: Business Organization and Management
Semester: I

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction Concepts of Business, Trade, Industry and Commerce:** Business – Meaning, Definition, Features and Functions of Business - Trade Classification – Aids to Trade – Industry Classification and Commerce - Factors Influencing the Choice of Suitable form of Organization.	15
II	**Forms of Business Organizations:** Features, Merits and Demerits of Sole Proprietor Ship and Partnership Business - Features Merits and Demits of Joint Stock Companies - Public Sector Enterprises (PSEs) - Multinational Corporations (MNCs)- Differences between Private Limited Public Limited Company.	15
III	**Company Incorporation:** Preparation of Important Documents for Incorporation of Company - Certificate of Incorporation and Certificate of Commencement of Business - Contents of Memorandum and Articles of Association – Content of Prospectus.	15
IV	**Management:** Meaning Characteristics - Fayol's 14 Principles of Management - Administration Vs. Management - Levels of Management.	15
V	**Functions of Management:** Different Functions of Management - Meaning – Definition – Characteristics Merits and Demits of Planning - Principles of Organization – Line and staff of Organization.	15

Text book:

Business Organization and management – R.K.Sharma, Monika Aggarwal,RahulSharma.

Reference Books:

5. Business Organization - C.D.Balaji and G. Prasad, MarghamPublications,Chennai.

6. Business Organization -R.K.Sharma and Shashi K Gupta, KalyaniPublications.

7. Business Organization & Management: Sharma Shashi K. Gupta, Kalyani Publishers.

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TITLE OF THE PAPER: Business Environment

Semester: I

Syllabus

Unit	Learning Units	Lecture Hours
I	**Overview of Business Environment:** Business Environment – Meaning – Characteristics – Scope -Macro and Micro Dimensions of Business Environment -Environmental Analysis-Purpose &Techniques.	15
II	**Economic Environment:** Economic Environment – Nature of the Economy – Structure of Economy – Economic Policies & Planning the Economic Condition – NITI Ayog – National Development Council – Five Year Plans	15
III	**Economic Policies:** Economic Reforms and New Economic Policy – New Industrial Policy – Competition Law – Fiscal Policy – Objectives and Limitations – Monetary Policy and RBI	15
IV	**Social, Political and Legal Environment:** Concept of Social Responsibility of Business towards Stakeholders - Demonetization, GST and their Impact - Political Stability - Legal Changes.	15
V	**Global Environment:** Globalization – Meaning – Role of WTO – WTO Functions -IBRD– Trade Blocks, BRICS, SAARC, ASEAN in Globalization	15

Text book: . Rosy Joshi and SangamKapoor :Business Environment

Reference Books

1. K. Aswathappa : Essentials of Business Environment, Himalaya PublishingHouse
2. Francis Cherunilam : Business Environment,HimalayaPublishingHouse
3. Dr S Sankaran: : Business Environment, MarghamPublications

TITLE OF THE PAPER: INSURANCE PROMOTION

Semester: I

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction of Insurance** Types of insurances. Growth of Insurance sector in India - Regulatory mechanism (IRDA) - Its functions	10
II	**Life Insurance plans. Health insurance plans.** Products and features. Contents of documents– Sales Promotion methods - Finding prospective customers –Counseling – Helping customers in filing - Extending post-insurance service to customers	10
III	**General Insurance** It's products (Motor, Marine, Machinery, Fire, Travel and Transportation) and features. Contents of documents. Dealing with customers – Explaining Products to Customers - Promoting Customer loyalty. Maintenance of Records.	10

Reference books:
1. Principles of Insurance, Himalaya publishing House
2. Principles and Practice of Insurance,
3. Fundamentals of insurance,
4. Life and General Insurance Management,
5. Financial services, Tata McGraw hill
6. Insurance Principles and Practices, Sultan Chand &Son

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TITLE OF THE PAPER: Advanced Accounting

Semester: III

Syllabus

Unit	Learning Units	Lecture Hours
I	**Accounting for Non Profit Organizations**: Non Profit Entities- Meaning - Features of Non-Profit Entities –Provisions as per Sec 8 - Accounting Process- Preparation of Accounting Records - Receipts and Payments Account- Income and Expenditure Account - Preparation of Balance Sheet (including problems).	15
II	**Single Entry Syste** Features Differences between Single Entry and Double Entry – Disadvantages of Single Entry- Ascertainment of Profit and Preparation of Statement of Affairs (including Problems) - Conversion of Single entry to Double entry system (Simple Problems).	15
III	**Hire Purchase System:** Features –Difference between Hire Purchase and Installment Purchase Systems - Accounting Treatment in the Books of Hire Purchaser and Hire Vendor - Default and Repossession (including Problems).	15
IV	**Partnership Accounts-I:** Meaning – Partnership Deed - Fixed and Fluctuating Capitals-Accounting Treatment of Goodwill - Admission and Retirement of a Partner (including problems).	15
V	**Partnership Accounts-II:** Dissolution of a Partnership Firm – Application of Garner v/s Murray Rule in India – Insolvency of one or more Partners (including problems).	15

Textbook:
1. S.P JAIN AND K.L NARANG, ADAVNCED ACCOUNTANCY, KALYANI PUBLISHERS
Recommended Reference book:
1. SN Maheswari& SK Maheswari, Financial Accounting, VikasPublications.
2. R.L. Gupta & V.K. Gupta, Principles and Practice of Accounting, Sultan Chand &Sons.
3. S.N.Maheshwari&V.L.Maheswari, Advanced Accountancy (Vol-II), Vikaspublishers.
4. S.P. Jain & K.L Narang, Accountancy–III, KalyaniPublishers.

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TITLE OF THE PAPER: Business Statistics

Semester: III

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction to Statistics:** Definition, Importance and limitation of statistics, Collection of data, Schedule and questionnaire, Frequency distribution, Tabulation	12
II	**Measures of Central Tendency:** Characteristics of measures of central tendency, Types of Averages, Arithmetic Mean, Geometric Mean, Harmonic Mean, Median, Mode	18
III	**Measures of dispersion and Skewness:** Properties of dispersion, Range, Quartile Deviation, Mean deviation, Standard deviation, Coefficient of Variation, Skewness Definition, Karl Pearson's and Bowley's Measures Of skewness	15
IV	**Measures of Relation:** Meaning and use of correlation, Types of correlation, Karl Pearson's correlation coefficient, Probable Error, Spearman's Rank correlation, Regression analysis comparison between correlation and Regression, Regression Equations	15
V	**Analysis of Time Series & Index Numbers** Meaning and utility of time series, Components of Time series, Measurement of trend and Seasonal Variations, Techniques of Time series analysis, Methods of averages(Semi , Moving averages), Least square method, Index Numbers, Methods of Construction of Index numbers, Price index numbers, Limitations of index numbers.	15

Text Book
1) Business Statistics –S.Chand

Reference Books:
1) Business Statistics – S. L Agarwal , S. L Bhrdwaj, K. Raghuveer – Kalyani publishers
2) Business Statistics And Operations Research – Dr. S.P .Gupta, P.K. Gupta, Dr.Manmohan – S. Chand

TITLE OF THE PAPER: Marketing
        Semester: III

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**Introduction**: Concepts of Marketing: Need, Wants and Demand - Marketing Concepts – Marketing Mix - 4 P's of Marketing – Marketing Environment.	15
II	**Consumer Behavior and Market Segmentation**: Buying Decision Process – Stages – Buying Behavior – Market Segmentation –Bases of Segmentation - Selecting Segments – Advantages of Segmentation	15
III	**Product Management:** Product Classification – Levels of Product - Product Life Cycle - New Products, Product Mix and Product Line Decisions - Design, Branding, Packaging and Labeling.	15
IV	**Pricing Decision**: Factors Influencing Price – Determination of Price - Pricing Strategies: Skimming and Penetration Pricing.	15
V	**Promotion and Distribution:** Promotion Mix - Advertising - Sales promotion - Publicity – Public Relations - Personal Selling and Direct Marketing - Distribution Channels – Online Marketing	15

References:
1. Philip Kotler, Marketing Management, Prentice Hall of India.
2. Philip Kotler & Gary Armstrong, Principles of Marketing, Pearson Prentice
3. Stanton J. William & Charles Futrell Fundamentals of Marketing, McGraw Hill Company

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TITLE OF THE PAPER: E COMMERCE

Semester: III

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction, Nature and Scope** Introduction- Definition –importance- Nature and scope- Advantages and limitations-Types of ecommerce B2B,B2C,C2B,C2C,B2A,C2A-Frameworkecommerce	15
II	**Environmental and Technical support Aspects** Technical Components-Internet and its component structure-Internet Vs Intranet, Vs Extranet and their differences-Website design- its structure-designing, developing and deploying the system-	15
III	**Security and Legal Aspects** Security environment –its preliminaries and precautions-protecting Web server with Firewalls-Importance of Digital Signature –its components – Cyber Law-Relevant Provisions of IT Act2000.	15
IV	**Operational Services of e Commerce** E retailing –features- E Services-Banking, Insurance, Travel, Auctions, Learning, Publication and Entertainment-Payment of utilities (Gas, Current Bill, Petrol Products)- On Line Shopping (Amazon, Flip kart, Snap deal etc.)	15
V	**E payment System** Types of e payment system- its features-Digital payments (Debit Card/Credit Cards, Internet Banking, Mobile wallets- Digital Apps (unified Payment Services-Phone Pay, Google Pay, BHIMEtc.)UnstructuredSupplementaryServicesData(BankPrepaidCard, Mobilebanking)-	15

Text Books:
1. Bharat Bhaskar , Electronic Commerce Framework, Technology and Application.McGrawHillEducation

References:
1. Bajaj,D.Nag,ECommerce, TataMcGrawHillPublication

2. WhitelyDavid , E-Commerce,McGrawHill

3. TNChhabra,ECommerce,DhanapatRai&Co

4. DaveChaffey,EBusinessandECommerceManagement,PearsonPublication

5.Dr.PratikkumarPrajapati,Dr.M.Patel,ECommerce,RedshinePublication

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TITLE OF THE PAPER: ONLINE BUSINESS
Semester: III

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction to Online-Business** Definition-Characteristics-Advantages of Online Business-Challenges-Differences between off-line business, e-commerce and Online Business.	10
II	**Online-business Strategies** Strategic Planning Process- Procurement -Logistics & Supply Chain Management- Customer Relationship management.	10
III	**Designing Online Business Website** Policies - Security & Legal Issues - Online Advertisements - Payment Gateways - Case Study	10

TITLE OF THE PAPER: INSURANCE PROMOTION

Semester: III

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction of Insurance** Types of insurances. Growth of Insurance sector in India - Regulatory mechanism (IRDA) - Its functions	10
II	**Life Insurance plans. Health insurance plans.** Products and features. Contents of documents– Sales Promotion methods - Finding prospective customers – Counseling – Helping customers in filing - Extending post-insurance service to customers	10
III	**General Insurance** Its products (Motor, Marine, Machinery, Fire, Travel and Transportation) and features. Contents of documents. Dealing with customers – Explaining Products to Customers - Promoting Customer loyalty. Maintenance of Records.	10

Reference books:

1. Principles of Insurance, Himalaya publishing House
2. Principles and Practice of Insurance,
3. Fundamentals of insurance,
4. Life and General Insurance Management,
5. Financial services, Tata McGraw hill
6. Insurance Principles and Practices, Sultan Chand &Son

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TITLE OF THE PAPER: DIGITAL MARKETING
Semester: V / VI
Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction** Digital marketing: Meaning – importance – traditional online marketing vs digital marketing – online market place analysis Micro Environment – Online Macro Environment - trends in digital marketing – competitive analysis.	15
II	**Web site planning and creation** Web Site: meaning – objectives – components of website - website creation – incorporation of design and– adding content, installing and activating plugins.	15
III	**Search Engine Optimization (SEO)** SEO: Meaning – History and growth of SEO –Importance of Search Engine - On page Optimization – off page optimization – Role of Search Engine Operation- google Ad words – Search Engine Marketing: Campaign Creation – Ad Creation, Approval and Extensions.	15
IV	**Social Media Marketing**: Meaning of social media and Social Media Marketing – social Management tools-strategy and planning – social media network – Social Networking – video creation and sharing – use of different social media platforms - Content creation - Blogging – Guest Blogging.	15
V	**Email marketing**: Meaning – Evolution of email – importance of email marketing – Development and Advancements in e mail marketing - email marketing platforms – creating and Tracking emailers–create forms – create opt-in lists – mapping industry trends and eliminating spam messages.	15

References

1.Digital Marketing for Dummies **by** Ryan Deiss& Russ Henneberry, publisher John Wiley first edition 2020.

2. **Youtility by** JayBaer, Published by Gilda MedialL C Portfolio 2013,

3. **Epic Content Marketing by** Joe Pulizzi, McGraw-Hill Education, 2013.

4. New Rules of Marketing and PR byDavidMeermanScott.Wiley, 2017

5. **Social Media Marketing All-in-one Dummies by** JanZimmerman, DeborahNg, John Wiley &Sons.

6. Digital Marketing 2020 **by** Danny Star, Independently Published, 2019

7. *Web sources suggested by the concerned teacher and college librarian including reading material.*

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TITLE OF THE PAPER: Service Marketing
Semester: V / VI

.   **Syllabus**

Unit	Learning Units	Lecture Hours
I	**Introduction: Nature and Scope of services** Introduction: Nature and Scope of services characteristics of services, classification of services – need for service marketing - reasons for the growth of services sector, Overview of marketing Different Service Sectors -Marketing of Banking Services -Marketing in Insurance Sector - Marketing of Education Services.	15
II	**Consumer Behavior in Services Marketing** Customer Expectations on Services- Factors influencing customer expectation of services. - Service Costs experienced by Consumer, the Role of customer in Service Delivery, Conflict Handling in Services, Customer Responses in Services, Concept of Customer Delight	15
III	**Customer Relationship marketing and Services Market Segmentation.** Customer Relationship marketing: Meaning -Importance of customer & customer's role in service delivery, Benefits of customer relationship, retention strategies. Services Market Segmentation: - Market segmentation - Basis & Need for segmentation of services, bases of segmentation services, segmentation strategies in service marketing.	15
IV	**Customer Defined Service Standards.** Customer Defined Service Standards - Hard and Soft, Concept of Service Leadership and Service Vision -Meeting Customer Defined Service Standards -Service Flexibility Versus Standards - Strategies to Match Capacity and Demand - managing Demand and Supply of Service –applications of Waiting Line and Queuing Theories to Understand Pattern Demand.	15
V	**Service Development and Quality Improvement.** Service Development – need, importance and Types of New Services - stages in development of new services, service Quality Dimensions - Service Quality Measurement and Service Mapping, Improving Service Quality and Service Delivery, Service Failure and Recovery.	15

References

1. John E.G. Bateson, K.Douglas Hoffman: Services Marketing, Cengage Learning, 4e, 2015 publication

2. Vinnie Jauhari, Kirti Dutta: Services Marketing: Operations and Management, Oxford University Press, 2014.

3. Valarie A. Zeithaml and Mary Jo-Bitner: Services Marketing – Integrating Customer Focus Across The Firm, Tata McGraw Hill Publishing Company Ltd., 6e, 2013.

4. Nimit Chowdhary, Monika Chowdhary, Textbook of Marketing Of Services: The Indian Experience, Macmillan, 2013.

5. K. Rama Mohana Rao, Services Marketing, Pearson, 2e, 2011.

6. Dr. K. Karunakaran, Service Marketing (Text and Cases in Indian Context), Himalaya Publications.

7. *Web sources suggested by the concerned teacher and college librarian including reading material*.

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Department of Commerce

Minutes of the meeting of Board of Studies

13-4-2023

TITLE OF THE PAPER: Financial Accounting

Semester: II

Syllabus

Unit	Learning Units	Lecture Hours
I	**Depreciation:** Meaning and Causes of Depreciation - Methods of Depreciation: Straight Line – Written Down Value –Annuity and Depletion Method (including Problems).	15
II	**Provisions and Reserves**: Meaning – Provision vs. Reserve – Preparation of Bad Debts Account – Provision for Bad and Doubtful Debts – Provision for Discount on Debtors – Provision for Discount on Creditors - Repairs and Renewals Reserve A/c (including Problems).	15
III	**Bills of Exchange:** Meaning of Bill – Features of Bill – Parties in the Bill – Discounting of Bill – Renewal of Bill – Entries in the Books of Drawer and Drawee (including Problems).	15
IV	**Consignment Accounts**: Consignment - Features - Proforma Invoice - Account Sales – Del-credere Commission - Accounting Treatment in the Books of Consigner and Consignee - Valuation of Closing Stock - Normal and Abnormal Losses (including Problems).	15
V	**Joint Venture Accounts**: Joint Venture - Features - Difference between Joint Venture and Consignment – Accounting Procedure – Methods of Keeping Records– One Vendor Keeps the Accounts and Separate Set off Books Methods (including Problems).	15

Test Book Prefer:

1. Financial Accounting By: S.P.Jain & K.L. Narang. Kalyani Publishers – New Delhi.

Reference text books:

1. Financial Accounting – Himalaya Publishers
2. Financial Accounting – Pragthi prakesh Publishers

Suggested Co-Curricular Activities:

1. Quiz Programs
2. Problem Solving Exercises
3. Seminar
4. Group Discussions on problems relating to topics covered by syllabus

TITLE OF THE PAPER: BUSINESS ECONOMICS

Semester: II

Syllabus

Unit	Learning Units	Lecture Hours
I	**INTRODUCTION :** Meaning and Definition of Economics Wealth Definition Welfare Definition Scarcity Definition Meaning and Definition of Business Economics Nature and Scope of Business Economics Micro Economics and Macro Economics	15
II	**DEMAND AND SUPPLY ANALYSIS :** Meaning and Definition of demand Determinants of Demand – Demand Function Law of Demand – Demand curve – exceptions Elasticity of Demand Types of Price Elasticity of Demand Methods to measure Price Elasticity of Demand Law of Supply-Exceptions to the Law	15
III	**PRODUCTION, COST AND REVENUE ANALYSIS :** Production Analysis – Production Function – Meaning The law of variable proportions The law of Returns to Scale **Cost Analysis:** Short Run Cost Curves Relationship between AC & MC Curves **Revenue Analysis:** Revenue Concepts & Revenue curves Meaning of Breakeven point & Breakeven chart	15
IV	**MARKET STRUCTURES:** Classification of markets Features of Perfect competition Price determination under perfect competition Features of Monopoly market Features of monopolistic competition market Features of Oligopoly market Kinky Demand Curve analysis	15
V	**NATIONAL INCOME AND TRADE CYCLES :** National Income Meaning and Definition of National Income (Marshall, Pigou, Fisher) Concepts of National Income – GDP, GNP, NDP, NMP, NNPFC, PI, DI, PCI, RNI, RPCI National Income Measurement (Product, Income & Expenditure Methods) Problems in measuring National Income Trade Cycles Meaning and Definition of Trade cycles Phases of Trade Cycles Causes for Trade Cycles Controlling Measures of Trade Cycles	15

Text Books :

Business Economics – A.V. Ranganadhachary – Kalyani PublishersBusiness Economics – Telugu Academy

Reference Books:

H.L. AHUJA – Business Economics – S.Chand & Company Publishers

P.N. CHOPRA – Business Economics – Kalyani Publishers

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TITLE OF THE PAPER: ADVERTISING

Semester: II

Skill Development Course

Maximum 50 Marks

UNIT I: Introduction of advertising concepts –

functions - Types of advertising - Creativeadvertising messages - Factors determining opportunities of a product/service/Idea

UNIT II: Role of advertising agencies and their responsibilities - scope of their work and functions - - Ethical issues - Identifying target groups -Laws in advertising. Advertising StatutoryBodies in India - Role of AAAI (Advertising Agencies Association of India), ASCI (Advertising Standard Council of India)

UNIT III: Types of advertising – Basic characteristics of a typical advertisement –Reachingtarget groups - Local advertising – Feedback on impact of advertisement - Business promotion.

Reference book sand Websites:

1.Bhatia. K.Tej - Advertising and Marketing in Rural India - Mc Millan India

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SEMESTER –II

TITLE OF THE PAPER: RETAILING

SYLLABUS:

Unit I: Introduction –

Retailing - Definition– Role of Retailing- Types of Retailing – Factors influencingthe Growth of Retailing in India.

Unit II: Store location –

factors influencing selection of location - Types of retail outlets - storesdesign & operations- Merchandise planning - Administrative mechanism

Unit III: Human resources in retailing –

Job profile- Services to customers – Customer care - Communications with customers - Visual merchandising – enhancing customer loyalty and Salespromotion.

Recommended Co-curricularActivities (04 hrs):

1. Collection of information on local retailing

2. Invited lecture/skills training by a local expert

3. Visit near-by stores /Godowns/warehouses and prepare study projects

4. Field training during leisure hours

5. Assignments, Group discussion, Sharing of experience etc.

Reference books:

1. 1.Swapna pradhan.R.M - Retail Management - Tata Mg Graw Hill

2. Berman, Barry & Evans - Retailing Management- A strategic Approach - Pearson

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TITLE OF THE PAPER: Corporate Accounting

Semester: IV

Syllabus

Unit	Learning Units	Lecture Hours
I	**Accounting for Share Capital: Kinds of Shares –** Types of Preference Shares –Issue of Shares at Par, Discount and Premium – Forfeiture and Reissue of Shares (including problems).	15
II	**Issue and Redemption of Debentures and Issue of Bonus Shares:** Accounting Treatment for Debentures Issued and Repayable at Par, Discount and Premium -Issue of Bonus Shares –Issue of right shares- Buyback of Shares - (including problems).	15
III	**Valuation of Goodwill:** Need and Methods - Average Profit Method, Super Profits Method – Capitalization Method and Annuity Method (Including problems).	15
IV	**Valuation Shares:** Need for Valuation - Methods of Valuation - Net Assets Method, Yield Basis Method, Fair Value Method (including problems).	15
V	**Company Final Accounts**: Provisions of the Companies Act, 2013 - Preparation of Final Accounts – Adjustments Relating to Preparation of Final Accounts – Profit and Loss Account and Balance Sheet – (including problems with simple adjustments).	15

Reference Books:

1. Corporate Accounting – T.S Reddy and Murthy, MarghamPublications, Chennai.

2. Advanced Accounts: M C Shukla, T S Grewal and S C Gupta, S Chand Publications

3. Corporate Accounting – Haneef & Mukherji, Tata McGraw Hill Publications.

4. Corporate Accounting – RL Gupta & Radha Swami,Sultan Chand & sons

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TITLE OF THE PAPER: Cost and Management Accounting

Semester: IV

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction**: Cost Accounting: Definition – Features – Objectives – Functions –Scope – Advantages and Limitations - Management Accounting: Features – Objectives – Functions – Elements of Cost - Preparation of Cost Sheet (including problems)	15
II	**Material and Labour Cost:** Techniques of Inventory Control – Valuation of Material Issues: FIFO - LIFO Simple and Weighted Average Methods Labour: Direct and Indirect Labour Cost – Methods of Payment of Wage Incentive Schemes -Time Rate Method, Piece Rate Method, Halsey, Rowa Methods and Taylor Methods only (including problems)	15
III	**Marginal Costing:** Meaning and Features of Marginal Costing – Contribution –Profit Volum Ratio- Break Even Point – Margin of Safety – Estimation of Profit an Estimation of Sales(including problems)	15
IV	**Financial Statement Analysis and Interpretation**: Financial Statements - Features, Limitations. Need, Meaning, Objectives. an Process of Financial Statement Analysis- Comparative Analysis – Common SizAnalysis and Trend Analysis (including problems)	15
V	**Cash Flow Statement** Introduction and meaning - Accounting standard 3-Comparison between fundand cash flow statements - Uses and significance of cash flow statement Limitations of cash flow statement-Procedure for preparing a cash flo statement -Sources of cash inflows - Application of cash or casoutflows.(Problems).	15

References:

1. S.P. Jain and K.L. Narang – Advanced Cost Accounting, Kalyani Publishers.

2. M.N. Arora – A test book of Cost Accounting, Vikas Publishing House Pvt. Ltd.

3. S.P. Iyengar – Cost Accounting, Sultan Chand & Sons.

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TITLE OF THE PAPER: Income Tax

Semester: IV

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction**: Income Tax Act-1961 - Basic Concepts: Income, Person, Assessee - Assessment Year, Previous Year, Rates of Tax, Agricultural Income, Residential Status of Individual -Incidence of Tax – Incomes Exempt from Tax (theory only).	15
II	**Income from Salaries**: Basis of Charge, Tax Treatment of Different Types of Salaries Allowances, Perquisites, Profits in Lieu of Salary, Deductions from Salary Income, Computation of Salary Income (including problems).	15
III	**Income from House Property and Profits and Gains from Business**: Annual Value, Let-out/Self Occupied/Deemed to be Let-out house -Deductions from Annual Value - Computation of Income from House Property **Definition of Business and Profession** – Procedure for Computation of Income from Business – Revenue and Capital Nature of Incomes and Expenses – Allowable Expenses – Expenses Expressly Disallowed – Computation (including problems).	15
IV	**Income from Capital Gains - Income from Other Sources**: Meaning of CapitalAsset – Types – Procedure for Computation of Long-term and Short-term Capital Gains/Losses Meaning of Other Sources - General Incomes – Specific Incomes – Computation (including problems).	15
V	**Computation of Total Income of an Individual**: Deductions under Section 80 -Computation of Total Income (Simple problems).	15

Reference Books:

1. Dr. Vinod; K. Singhania; Direct Taxes – Law and Practice, Taxman Publications

2. T. S. Reddy and Dr. Y. Hari Prasad Reddy - Taxation , by Margham Publications

3. Premraj and Sreedhar, Income Tax, Hamsrala Publications

4. B.B. Lal - Direct Taxes; Konark Publications

5. Dr. Mehrotra and Dr. Goyal -Direct Taxes, Law and Practice, Sahitya Bhavan

TITLE OF THE PAPER: **Business Laws**

Semester: IV

Syllabus

Unit	Learning Units	Lecture Hours
I	**Contract**: Meaning and Definition of Contract - Essential Elements of ValidContract - Valid, Void and Voidable Contracts - Indian Contract Act, 1872	15
II	**Offer, Acceptance and Consideration**: Definition of Valid Offer, Acceptance andConsideration - Essential Elements of a Valid Offer, Acceptance and Consideration.	15
III	**Capacity of the Parties and Contingent Contract**: Rules Regarding to Minors Contracts - Rules Relating to Contingent Contracts - Different Modes of Discharge of Contracts - Rules Relating to Remedies to Breach of Contract.	15
IV	**Sale of Goods Act 1930 and Consumer Protection Act 2019**: Contract of Sale - Sale and Agreement to Sell - Implied Conditions and Warranties - Rights of UnpaidVendor- Definition of Consumer - Person - Goods - Service - Consumer Dispute - Consumer Protection Councils - Consumer Dispute Redressal Mechanism	15
V	**Cyber Law**: Overview and Need for Cyber Law - Contract Procedures - DigitalSignature – Safety Mechanisms	15

References:

1. J. Jaysankar, Business Laws, Margham Publication. Chennai.

2. ND Kapoor, Business Laws, S Chand Publications.

3. Balachandram V, Business law, Tata McGraw Hill.

4. Tulsian, Business Law, Tata McGraw Hill.

5. Pillai Bhagavathi, Business Law,SChand Publications

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TITLE OF THE PAPER: Auditing

Semester: IV

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction:** Meaning – Objectives – Importance of Auditing – Characteristics - Book Keeping vs Auditing - Accounting vs Auditing – Role of Auditor in Checking Corporate Frauds.	15
II	**Types of Audit:** Based on Ownership,Time and Objective - Independent, Financial, Internal, Cost,Tax, Government, Secretarial Audits	15
III	**Planning of Audit:** Steps to be taken at the Commencement of a New Audit – Audit Programme - Audit Note Book– Audit Working Papers - Audit Evidence - Internal Check, Internal Audit and Internal Control	15
IV	**Vouching and Investigation:** Definition and Importance of Vouching – Objectives of Vouching -Vouching of Cash and Trading Transactions – Investigation - Auditing vs. Investigation	15
V	**Company Audit and Auditors Report:** Auditor's Qualifications – Appointment and Reappointment – Rights, Duties, Liabilities and Disqualifications - Audit Report: Contents –Preparation - Relevant Provisions of Companies Act,2013.	15

References:

1. S.Vengadamani, "Practical Auditing", Margham Publications, Chennai.

2. Ghatalia, "Principles of Auditing", Allied Publishers Pvt. Ltd., New Delhi.

3. Pradeesh Kumar, BaldevSachdeva&Jagwant Singh, "Auditing Theory and

Practice,Kalyani Publications

4. N.D. Kapoor, "Auditing", S Chand, New Delhi.

5. R.G. Saxena, "Principles and Practice of Auditing", Himalaya Publishing House

New Delhi

TITLE OF THE PAPER: Goods and Service Taxes
Semester: IV

<div align="center">Syllabus</div>

Unit	Learning Units	Lecture Hours
I	**Introduction:** Overview of GST - Concepts –Taxes Subsumed under GST – Components of GST- GST Council- Advantages of GST-GST Registration.	15
II	**GST Principles** –Vijay Kelkar Sha Committee Recommendations - Comprehensive Structure of GST Model in India: Single, Dual GST – GST Rates - Taxes Exempted from GST- Taxes and Duties outside the purview of GST- Taxation of Services	15
III	**Tax Invoice**- Bill of Supply-Transactions Covered under GST-Composition Scheme- Reverse Charge Mechanism- Composite Supply -Mixed Supply	15
IV	**Time of Supply of Goods & Services**: Value of Supply - Input Tax Credit - Distribution of Credit -Matching of Input Tax Credit - Availability of Credit in Special Circumstances- Cross utilization of ITC between the Central GST and the State GST.	15
V	**GST Returns**: Regular Monthly Filing Returns-Composition Quarterly Filing Returns-GSTR-1, GSTR-2, GSTR 2A, GSTR-3, GSTR 3B -Annual Returns GSTR-9, GSTR 9A, GSTR 9B& GSTR 9C - Records to be Maintained under GST	15

References:

1. T. S. Reddy and Dr. Y. Hari Prasad Reddy, Business Taxation (Goods and Services Taxes),Margham Publications.

2. Taxmann's Basics of GST.

3. Taxmann's GST: A practical Approach.

4. Theory & Practice of GST, Srivathsala, Himalaya Publishing House.

5. Goods and Services Tax in India - Notifications on different dates. Library activities:

TITLE OF THE PAPER: Taxation

Semester: IV

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction:** Objectives- Principles of Taxation- Brief History- Basic Concepts- Capital and Revenue- Basis of Charge- Exempted Incomes - Residential Status - Incidence of Taxation	15
II	**Computation of income from Salary:** Income from Salary; Salary-Allowance -Perquisites – Deductions U/S 16- Deductions u/s80	15
III	**Computation of Income from House Property :** Income from House Property- Rental values – gross annual value – Net Annual Value – Deductions U/S24 (Simples problems)	15
IV	**Computation of income from Business and Profession:** Definition of Business and Profession -Admissible and inadmissible expenses-Computation of Business income: **Income from Profession:** Admissible Receipts and Payments - Computation of Professional income(Simple Problems)	15
V	**Introduction and Administration to GST AND Customs :** Meaning of GST- Nature and scope of GST - Merits and demerits of GST - Models of GST -CGST-SGST-IGST - Definitions: adjudicating- authority, agent, business, goods, places of business, In put tax credit ,**CUSTOMS**: Meaning and Introduction of Customs ,Salient features of Customs Act 1962	15

Reference Books:

1. Dr. Vinod; K. Singhania; Direct Taxes – Law and Practice, Taxman Publications

2. T. S. Reddy and Dr. Y. Hari Prasad Reddy - Taxation , by Margham Publications

3. Premraj and Sreedhar, Income Tax, Hamsrala Publications

4. B.B. Lal - Direct Taxes; Konark Publications

5. Dr. Mehrotra and Dr. Goyal -Direct Taxes, Law and Practice, Sahitya Bhavan

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TITLE OF THE PAPER: Advanced Corporate Accounting

Semester: V / VI

Syllabus

Unit	Learning Units	Lecture Hours
I	**Purchase of Business** Meaning - Purchase Consideration - Methods for determining Purchase Consideration-Discharge of Purchase Consideration-Accounting Treatment.	15
II	**Amalgamation of Companies** Meaning and Objectives - Provisions for Amalgamation of Companies as per Accounting Standard 14 - Accounting Treatment.	15
III	**Internal Reconstruction of Companies** Meaning - Forms of Internal Reconstruction - Alteration of Share Capital and Reduction of Share Capital- Accounting Treatment.	15
IV	**Accounts of Holding Companies** Meaning of Holding Companies and Subsidiary companies- Consolidated Financial Statements- Legal requirements on Consolidation-Calculation of Minority Interest- Accounting Treatment.	15
V	**Liquidation** Meaning - Modes of Winding up of a Company- - Liquidator's Final Statement of Account - Calculation of Liquidator's Remuneration - Preparation of Statement of Affairs and Deficiency Account- Accounting Treatment	15

References:

1. Goyal, Bhushan Kumar. Corporate Accounting. Taxmann, New Delhi
2. Kumar, Alok. Corporate Accounting. Kitab Mahal
3. Monga, J. R. Fundamentals of Corporate Accounting. Mayur Paper Backs, New Delhi
4. Sah, Raj Kumar, Concept Building Approach to Corporate Accounting, Cengage
5. Sehgal Ashok & Sehgal Deepak. Corporate Accounting
6. Tulsian P. C. Corporate Accounting. S Chand & Co. New Delhi
7. *https://thebookee.net/ad/advanced-corporate-accounting-and-accounting-standards*
8. Web resources suggested by the Teacher concerned and the College Librarian including reading material

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TITLE OF THE PAPER: SOFTWARE SOLUTIONS TO ACCOUNTING

Semester: V / VI

Syllabus

Unit	Learning Units	Lecture Hours
I	**Computerized Accounting** Microsoft Excel Spread Sheet- Functions in Excel- Preparation of Accounts, Statements and Budgets using MS Excel- Analysis and Interpretation.	15
II	**Introduction to Leading Accounting Soft wares** – Busy - Marg – Quick Books - Zoho Books -Tally- Features and Accounting.	15
III	**Tally ERP-9 - Company Creation** – Tally Startup Screen- Gateway of Tally- Create a Company - Alter & Delete company- Backup and Restore- Security Features in Tally.	15
IV	**Tally- Accounting Masters**- Groups- Create Ledgers- Alter& Delete - Inventory Masters- Creating Stock Groups - Stock Items- Unit of Measurement- Alter & Delete.	15
V	**Tally-Voucher Entry** – Vouchers Types - Vouchers Entry - Alter and deleting Settings Purchase Vouchers and Sales Vouchers including Tax component –Reports Generation.	15

References

1. Nadhani, Ashok K, Tally ERP 9 Training Guide, BPB Publications

2. Tally 9 in Simple Steps, Kogent Solutions Inc., John Wiley & Sons.

3. Tally 9.0 (English Edition), (Google eBook) Computer World

4. Tally.ERP 9 Made Simple Basic Financial Accounting by BPB Publisher.

5. Tally ERP 9 For Real Time Accounting by Avichi Krishnan

6. Fundamentals of Computers, by V. Rajaraman, PHI.

7. Tally ERP 9 book advanced user, Swayam Publication (www.tallyerp9book.com)

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TITLE OF THE PAPER: ADVERTISING AND MEDIA PLANNING

Semester: V / VI

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction, Nature and Scope** Advertising- Nature and Scope- Functions - Impact on Social, Ethical and Economical Aspects - Its Significance – Advertising as a Marketing Tool and Process for Promotion of Business Development - Criticism on advertising	15
II	**Strategies of Advertisements** Types of Advertising Agencies and their Strategies in Creating Advertisements - Objectives - Approach - Campaigning Process - Role of Advertising Standard Council of India (ASCI) - DAGMAR approach	15
III	**Process of Advertisement** Creativeness and Communication of Advertising –Creative Thinking – Process – Appeals – Copy Writing - Issues in Creation of Copy Testing –Slogan Elements of Design and Principles of Design	15
IV	**Media Planning** Advertising Media - Role of Media - Types of Media - Print Media - Electronic Media and other Media - Advantages and Disadvantages – Media Planning - Selection of Media	15
V	**Analysis of Market Media** Media Strategy – Market Analysis -Media Choices - Influencing Factors - Target, Nature, Timing, Frequency, Languages and Geographical Issues - Case Studies	15

References:

1. Bhatia. K.Tej - Advertising and Marketing in Rural India - Mc Millan India

2. Ghosal Subhash - Making of Advertising - Mc Millan India

3. Jeth Waney Jaishri& Jain Shruti - Advertising Management - Oxford university Press

4. Advertising Media Planning, Seventh Edition Paperback – by Roger Baron (Author), Jack Sissors (Author)

5. Media Planning and Buying in 21st Century – Ronald DGeskey

6. Media Planning and Buying: Principles and Practice in the Indian Context – Arpita Menon

7. Publications of Indian Institute of Mass Communications

8. Advertising and Salesmanship. P. Saravanavel, Margham Publicatio.

TITLE OF THE PAPER: SALES PROMOTION AND PRACTICE

Semester: V / VI

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction to Sales Promotion:** Nature and Scope of Sales Promotion-Influencing Factors - Sales Promotion and Control - Strengths and Limitations of Sales Promotion – Sales Organization - Setting-up of Sales Organization - Types of Sales Organization.	15
II	**Sales Promotion and Product Life Cycle:** Types of Sales Promotion - Consumer Oriented - Trade Oriented - Sales Oriented - Various Aspects -Sales Promotion methods in different Product Life Cycle – Cross Promotion - Sales Executive Functions- Theories of Personal Selling - Surrogate Selling.	15
III	**Strategies and Promotion Campaign:** Tools of Sales Promotion - Displays, Demonstration, Fashion Shows, Conventions - Conferences, Competitions – Steps in designing of Sales Promotion Campaign – Involvement of Salesmen and Dealers – Promotional Strategies - Ethical and Legal issues in Sales Promotion.	15
IV	**Salesmanship and Sales Operations**: Types of Salesman - Prospecting - Pre-approach and Approach - Selling Sequence - Sales budget, Sales territories, Sales Quota's - Point of Sale – Sales Contests - Coupons and Discounts - Free Offers - Showrooms and Exhibitions - Sales Manager Qualities and functions.	15
V	**Sales force Management and Designing:** Recruitment and Selection - Training - Induction - Motivation of sales personnel - Compensation and Evaluation of Sales Personnel - Designing of Events for Enhancing Sales Promotion	15

References:

1. Don.E. Schultz - Sales Promotion Essentials- Mc Graw hill India

2. S.H.H Kazmi & Satish K Batra, Advertising and Sales Promotion- Excel Books

3. Jeth Waney Jaishri& Jain Shruti - Advertising Management - Oxford university Press

4. Dr.ShailaBootwala Dr.M.D. Lawrence and Sanjay R.Mali -Advertising and Sales Promotion-NiraliPrakashan

5. Successful Sales Promotion – Pran Choudhury

6. Advertising and Sales Promotion Paperback – S. H. H. Kazmi & Satish Batra

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DEPARTMENT OF ENGLISH

HIGHLIGHTED SYLLABUS OF ENGLISH

2022-2023

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability   🟨

Skill-Development   🟦

Entrepreneurship   🟩

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ENGLISH	ENGT11B	2022-2023	B.A,B.Com & B.Sc

UNIT-I

Listening Skills

1. Importance of Listening
2. Types of Listening
3. Barriers to Listening
4. Effective Listening

UNIT-II
Speaking Skills

1. Sounds of English: Vowels and Consonants
2. Word Accent
3. Intonation

UNIT – III
Grammar

1. Concord
2. Modals
3. Tenses (Present/Past/Future)
4. Articles
5. Prepositions
6. Question Tags
7. Sentence Transformation (Voice, Reported Speech & Degrees of Comparison)
8. Error Correction

UNIT-IV
Writing

1. Punctuation
2. Spelling
3. Paragraph Writing

UNIT-V
Soft Skills

1. SWOC
2. Attitude
3. Emotional Intelligence
4. Telephone Etiquette
5. Interpersonal Skills

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ENGLISH	ENGT21B	2022-2023	B.A,B.Com & B.Sc

ENGLISH PRAXIS- II
A COURSE IN READING AND WRITING SKILLS

SYLLABUS

I. UNIT
Prose: 1. How to Avoid Foolish Opinions   Bertrand Russell   12
Skills: 2. Vocabulary: Conversion of Words
3. One Word Substitutes
4. Collocations

II. UNIT
Prose: 1. The Doll's House   Katherine Mansfield
Poetry: 2. Ode to the West Wind   P B Shelley
Non-Detailed Text: 3. Florence Nightingale   Abrar Mohsin   12
Skill: 4. Skimming and Scanning

III. UNIT
Prose : 1. The Night Train at Deoli   Ruskin Bond
Poetry: 2. Upagupta   Rabindranath Tagore   12
Skill: 3. Reading Comprehension
4. Note Making/Taking

IV. UNIT
Poetry: 1. Coromandel Fishers   Sarojini Naidu   12
Skill: 2. Expansion of Ideas
3. Notices, Agendas and Minutes

V.UNIT
Non-Detailed Text: 1. An Astrologer's Day   R K Narayan   12
Skills: 2. Curriculum Vitae and Resume
3. Letters
4. E-Correspondence

ENGLISH	ENG T01A	2022-2023	B.A,B.Com & B.Sc

UNIT-I
Speech
1. Tryst with Destiny   - Jawaharlal Nehru
Skills
2. Greetings
 3. Introductions
UNIT-II
Speech
1. Yes, We Can   Barack Obama
Interview
2. A Leader Should Know How to Manage Failure Dr.A.P.J.Abdul Kalam/India Knowledge at
    Wharton
Skills
3. Requests
UNIT-III
Interview
1. Nelson Mandela's Interview   With Larry King
Skills
2. Asking and Giving Information
3. Agreeing and Disagreeing
UNIT-IV
Interview
1. JRD Tata's Interview   With T.N.Ninan
Skills
2. Dialogue Building
3. Giving Instructions/Directions
UNIT-V
Speech
1. You've Got to Find What You Love Steve Jobs
Skills
2. Debates
3. Descriptions
4. Role Play

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DEPARTMENT OF ENVIRONMENTAL STUDIES

HIGHLIGHTED SYLLABUS OF ENVIRONMENTAL STUDIES
2021-22

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability ▢

Skill-Development ▢

Entrepreneurship ▢

ENVIRONMENTAL STUDIES

Common for BA/B.Com/BSc Programmes

COURSE CODE: ENS101 Semester – I (Total 30 Hours)

Unit-I : Natural Resources:

Definition, scope and importance. Need for public awareness. Brief description of; Forest recourses: Use and over-exploitation. Deforestation; timber extraction, mining, dams. Effect of deforestation environment and tribal people   Water resources: Use and over–utilization. Effects of over utilisation of surface and ground water. Floods, drought. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.   Food resources: World food problems, Effects of modern agriculture; fertilizer-pesticide, salinity problems.   Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.   Land resources: Land as resources, land degradation, man induced landslides, soil erosion and desertification

Unit-II : Ecosystems, Biodiversity and its conservation

Concept of an ecosystem   Structure and function of an ecosystem   Producers, consumers and decomposers   Food chains, food webs and ecological pyramids   Characteristic features of the following ecosystems:- Forest ecosystem, Desert ecosystem, Aquatic ecosystem. Value of biodiversity: Consumptive use, productive use. Biodiversity in India.   Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts.   Endangered and endemic species of India   Conservation of biodiversity

Unit-III : Environmental Pollution

Definition Causes, effects and control measures of :- a. Air pollution b. Water pollution c. Soil pollution d. Noise pollution   Solid waste management; Measures for safe urban and industrial waste disposal   Role of individual in prevention of pollution   Disaster management: Drought, floods and cyclones

Unit-IV : Social Issues and the Environment

From Unsustainable to Sustainable development   Water conservation, rain water harvesting, watershed management.   Climate change, global warming, ozone layer depletion,   Environment protection Act   Wildlife Protection Act, Forest Conservation Act

Unit-V : Human Population and the Environment

Population explosion, impact on environment.   Family welfare Programme   Environment and human health   Women and Child Welfare   Value Education   Role of Information Technology in Environment and humanhealth.

Reference Books :

1. Environmental Studies by Dr.M.Satyanarayana, Dr.M.V.R.K.Narasimhacharyulu, Dr.G. Rambabu andDr.V.VivekaVardhani, Published by Telugu Academy, Hyderabad.
2. Environmental Studies by R.C.Sharma, Gurbir Sangha, published by Kalyani Publishers.
3. Environmental Studies by Purnima Smarath, published by Kalyani Publishers.

HUMAN VALUES AND PROFESSIONAL ETHICS
Common for BA/B.Com/BSc/ Programmes

I Semester(Total 30 Hrs)
Unit-I: Introduction to Value Education
1. Value Education, Definition, Concept and Need for Value Education 2. The Content and Process of Value Education 3. Self-Exploration as a means of Value Education 4. Happiness and Prosperity as parts of Value Education

Unit-II: Harmony in the Human Being
1. Human Being is more than just the Body 2. Harmony of the Self ('I') with the Body 3. Understanding Myself as Co-existence of the Self and the Body 4. Understanding Needs of the Self and the Needs of the Body

Unit-III: Harmony in the Family and Society and Harmony in the Nature
1. Family as a basic unit of Human Interaction and Values in Relationships 2. The Basics for respect and today's Crisis : Affection, Care, Guidance, Reverence, Glory, Gratitude and Love
3. Comprehensive Human Goal : The Five dimensions of Human Endeavour

Unit-IV: Social Ethics
1. The Basics for Ethical Human conduct 2. Defects in Ethical Human Conduct
3. Holistic Alternative and Universal order 4. Universal Human Order and Ethical Conduct

Unit-V: Professional Ethics
1. Value Based Life and Profession 2. Professional Ethics and Right Understanding
3. Competence in Professional Ethics 4. Issues in Professional Ethics – The Current scenario
5. Vision for Holistic Technologies, Production System and Management Models

Reference Books:
1. A.N.Tripaty, Human Values, New Age International Publishers, 2003
2. Bajpai.B.L., Indian Ethos and Modern Management, New Royal Book Co., Lucknow, Reprinted, 2004
3. Bertrand Russell, Human Society in Ethics and Politics
4. Corliss Lamont, Philosophy of Humanism

ENTREPRENEURSHIP

Syllabus, For all Degree Programmes.

COURSE CODE: ENP201

Semester – IV (Total 30 Hrs)

Unit-I: Entrepreneurship: Entrepreneur Characteristics – Classification of Entrepreneurships – Incorporation of Business – Forms of Business organizations –Role of Entrepreneurship in economic development – Start-ups.

Unit-II: Idea Generation and Opportunity Assessment: Ideas in Entrepreneurships – Sources of New Ideas – Techniques for generating ideas – Opportunity Recognition – Steps in tapping opportunities.

Unit-III: Project Formulation and Appraisal : Preparation of Project Report –Content; Guidelines for Report preparation – Project Appraisal techniques –economic – Steps Analysis; Financial Analysis; Market Analysis; Technical Feasibility.

Unit-IV: Institutions Supporting Small Business Enterprises: Central level Institutions: NABARD; SIDBI, NIC, KVIC; SIDIO; NSIC Ltd; etc. – state level Institutions –DICs- SFC-SSIDC- Other financial assistance.

Unit-V: Government Policy and Taxation Benefits: Government Policy for SSIs- tax Incentives and Concessions –Non-tax Concessions – Rehabilitation and Investment Allowances.

Reference Books:
1. Arya Kumar, Entrepreneurship, Pearson, Delhi, 2012.
   2. Poornima M.CH., Entrepreneurship Development –Small Business Enterprises, Pearson, Delhi,2009
   3. Michael H. Morris, ET. al., Entrepreneurship and Innovation, Cen gage Learning, New Delhi, 2011
   4. KanishkaBedi, Management and Entrepreneurship, Oxford University Press, Delhi, 2009
   5. Anil Kumar, S., ET.al., Entrepreneurship Development, New Age International Publishers, New Delhi, 2011
   6. Khanka, SS, Entrepreneurship Development, S. Chand, New Delhi.
   7. Peter F. Drucker,Innovation and Entrepreneurship. 8. A.Sahay, M. S. Chhikara, New Vistas of Entrepreneurship: Challenges &Opportunities

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DEPARTMENT OF ECONOMICS

HIGHLIGHTED SYLLABUS OF ECONOMICS

2022-23

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability

Skill-Development

Entrepreneurship

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I B.A (HEP) – SEMESTER-I
MICRO ECONOMIC ANALYSIS
(ECOT11B)

No of Hours per week : 5
Credits :4

Course Outcomes : At the end of this course, students should be able to:
CO1 : Students are able to understand fundamentals of microeconomics
CO2 : Students are able to understand the behavior of consumer.
CO3 : Students are able to understand the behavior of producer.
CO4 : Student can evaluate the different market structures.
CO5 : Students can analyze the different theories of distribution.

Syllabus

Unit	Learning Units
I	**ECONOMIC ANALYSIS AND METHODOLOGY** : Definitions of Economics-Wealth Definition, Welfare Definition, Scarcity Definition, Growth Oriented Dynamic Definition **Methodology in Economics**- Micro and Macro Economics, Deductive and Inductive Methods, Production Possibility Curve (PPC)
II	**THEORY CONSUMTION:** Demand Analysis- Concept & Factors Determining Demand, Law of Demand and Exceptions. **Elasticity of Demand**- Types of Price Elasticity of Demand, Methods to Measure Price Elasticity of Demand. **Indifference Curve Analysis**-Indifference Schedule & Indifference map, Marginal Rate of Substitution, Properties of Indifference curves, Budget line & Consumers Equilibrium through Indifference Curve, Consumer's Surplus through Indifference Curve Analysis
III	**THEORY OF PRODUCTION:**Concept of Production Function-Cobb-Douglas Production Function, The law of variable propositions, The law of Return to Scale, Economies of large Scale Production. **Concepts of cost**- Short run Cost Curves. **Law of supply. Revenue Concepts**- (T.R., A.R. & M.R), Relationship between AR, MR & E.D, Cost minimization, Profit Maximization.
IV	**THEORY OF EXCHANGE :** Classification of Markets, Features of Perfect Market Conditions, Price Determination under Perfect Competition Market, Features of Monopoly Market, Features of Monopolistic Competition Market, Features of Oligopoly Market, Kinky Demand Curve Analysis
V	**THEORY OF DISTRIBUTION :**Concepts of Functional and Personal Distribution. Marginal Productivity Theory of Distribution. Theories of Rent-Ricardian Theory of Rent, Marshall's Economic rent. **Theories of Wages-** Standard of Living Theory of wages, Modern Theory of wages. **Theories of Interest-** Classical Theory of Interest, Loanable Funds Theory of Interest, Keynes Liquidity Preference Theory of Interest. **Theories of Profit-** Risks Theory of Profit, Uncertainty Theory of Profit, Dynamic Theory of Profit, Innovation Theory of Profit

II B.A (HEP) – SEMESTER-III
Development Economics
(ECOT31B)

No of Hours per week : 5
Credits :4

UNIT –I ECONOMIC GROWTH AND DEVELOPMENT

Introduction to Economic growth and development, Emergence of Economic development as a branch of Economics, Scope and Importance of Economic Development- *Desirability of Economic Development, Nature Of Development Problem, Nature of Economic Growth.* Meaning and Definitions of Economic growth and Economic development, Measurement of Economic Development and their limitations, Indicators of Economic Development, Economy and Environment, Concept of Green GDP, Sustainable Development and Inclusive Growth

UNIT – II MODERN ECONOMIC GROWTH

Meaning and definitions of Modern Economic Growth, World Bank(IBRD) classification of countries, International Monetary Fund(IMF) classification of countries, Simon Kuznets' Six characteristics of Modern Economic Growth, Obstacles to Economic Development- *Vicious Circle of Poverty, Market Imperfections, Economic and Non-Economic obstacles, Impact of International Trade and Colonialism.* Factors of Governing Economic Development

UNIT – III THEORIES OF DEVELOPMENT AND UNDER DEVELOPMENT

Classical theories of Economic Development- Adam Smith's theory of Economic Growth, Ricardian theory of Economic Growth, Malthusian theory of Economic Growth, Marxian theory of Economic Development, Schumpeter theory of Economic Development, **Theories/Models of Economic Growth -** W.W. Rostow stages of Economic Growth, Harrod-Domar Two sector growth model, R.M. Solow Model of Economic Growth, Joan Robinson's Golden Age of Economic Growth

UNIT – IV STRATEGIES OF ECONOMIC DEVELOPMENT

Introduction to growth strategies/models- Big Push Theory (Rodon's Theory), The Theory of Balanced Growth, The Theory of Unbalanced Growth, Mahalanobis Model of Economic Growth. **Techniques for Economic Development -** Agriculture vs. Industry, Capital Intensive Techniques vs Labour Intensive Techniques, Role of Infrastructure in Economic Development

UNIT – V INSTITUTIONS AND ECONOMIC DEVELOPMENT

Meaning of Market Economy and State Economy - Role of market and reasons for market failure, Role of state regulation on economic systems and problems, Interdependence of market and state, Public sector vs private sector. **Economic Planning -** Concept and Objectives of Economic Planning, Types of Economic Planning, NITI Aayog.

Economic Federalism and Financial Institutions in Economic Development - Role of Financial institutions in Economic Development, Role of World Bank (IBRD) in Economic Development, Role of Asian Development Bank (ADB) in Economic Development, Role of International Monetary Fund (IMF) in Economic Development, Role of Foreign Trade in Economic Development, Concept of FIIs and FDIs in Economic Development

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II B.A (HEP) – SEMESTER-III
Financial Markets
(SDCECOT01)
Total Hours : 30 (2 Hr/w), Credits : 02, Max Marks : 50

Learning Outcomes
After successful completion of this course, the student will be able to
1. Acquire knowledge of financial terms
2. Know the concepts relating to markets and different avenues of investment
3. Understand the career skills related to stock exchanges
4. Comprehend the personal financial planning and money market skills

UNIT –I   INTRODUCTION
Structure of Indian Financial System and its components,
Financial markets and institutions

UNIT –II   MONEY MARKET
Structure and Components of Money markets, Submarkets (Call money, Commercial Bills, Treasury Bills, Certificate of Deposits, Commercial Papers), Defects in Indian Money market

UNIT –III   CAPITAL MARKET
Functions of Capital Market, Elements of Capital Markets (Shares, Debentures, Bonds, Mutual funds), Equity Market (Structures and Functions of SEBI), Secondary Market (BSE, NSE)

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An autonomous college in the jurisdiction of Krishna university
III B.A (HEP), SEMESTER – V/VI
COURSE – VI(ECO-501C)
INSURANCE SERVICES

No of Hours per week : 5
Credits :4

UNIT I   : INSURANCE CONCEPT AND PRINCIPLES

Risk Management: Risk and Uncertainty, Risk Classification – Concept, Importance and Types of Insurance– Principles of Insurance – Insurance Regulations in India - Role of IRDA and Insurance Ombudsman –Scope for Insurance Business in India.

UNIT II : LIFE INSURANCE AND PRODUCTS

Life Insurance: Nature and Features - Major Life Insurance Companies in India - Important Life Insurance Products/policies and their Features: Conventional, Unit Linked, Annuities, Group Policies – Medical Examiner.

UNIT III : GENERAL AND HEALTH INSURANCES AND PRODUCTS

General Insurance: Nature, Features and Types - Major General Insurance Companies in India - Important General Insurance Products/Policies and their Features - Surveyor – Health Insurance: Nature and Features -   Health Insurance Companies in India - Major Health Insurance Products/policies and their Features: Individual, Family, Group.

UNIT IV : PRACTICING AS AN INSURANCE AGENT

Insurance Contract and Terms of Insurance Policy - Registration of Insurance Agency with the Company - Procedure to issue a Policy: Application and Acceptance – Policy Lapse and Revival – Premium Payment, Assignment, Nomination and Surrender of Policy – Policy Claim - Important Websites and Apps of Insurance in India.

UNIT V : UNDERSTANDING THE CUSTOMER AND CASE STUDIES

Insurance Customer and Categories   – Understanding Customer Mindset and Satisfaction - Addressing the Grievances of the Customer – Ethical Behavior in Insurance – Moral Hazard –Discussion of two different Case Studies related to Life or General or Health Insurance Services.

III B.A (HEP), SEMESTER – V/VI
COURSE –VII ECO502C
BANKING AND FINANCIAL SERVICES

No of Hours per week : 5
Credits :4

UNIT I : PRINCIPLES OF BANKING AND INDIAN BANKING SYSTEM

Meaning of Banking – Principles of Banking – Functions of Banking – Structure of Indian Banking System – Regulations of Banking in India – Role of RBI in Banking – Anti-money Laundering - Basics of Financial literacy - Problems and Challenges of Banking in India.

UNIT II : DEPOSITS, LOANS AND DIGITAL BANKING

Bank Deposit Account Types – Account Opening and Closing – Banking Customer types – KYC Norms – Negotiable Instruments: Cheque, Bill of Exchange, Promissory Note, Endorsement - Principles of Lending – Different categories of Loans – Mortgaging -Priority Sector Lending – E-Banking facilities: Debit Card, Credit Card, Net Banking, Mobile Banking, Tele-banking, Micro ATMs, Digital Currency – Core Banking Solutions.

UNIT III : BANKING CORRESPONDENTS AND COMMON SERVICE CENTERS

Banking Correspondent Model - Activities of Banking Correspondent: Deposit Mobilization.

Identification of Borrowers, Collection and Recovery Loan, Other Banking Services – Common Services Centre (CSC) - Provision of Services by CSC – Requirement for Registering CSC and Telecentre - Case Study of Banking Correspondents with any Bank or CSC in Local Area.

UNIT IV : FINANCIAL SERVICES OF NBFIS

Non-Banking Financial Institutions (NBFIs): Types and Major Players of NBFIs in India – Important Financial Services offered by NBFIs and their Features – Concept of EMI - Micro Finance: Concept and Operation - Chit Funds: Concept and Operations– Payment Banks - Regulations of NBFIs in India – Problems and Challenges of NBFIs in India.

UNIT V : WORK WITH FINANCE SERVICE COMPANY (FSC)

Types of loans by Finance Service Company (FSC) – Customer of FSC: Types and Needs - Marketing of FSC's Loans – Procedures and Requirements in FSC's Loan Sanction - Collection and Recovery of FSC Loans - Case Study of a FSC's services in Local Area.

AG&SG SIDDHARTHA DEGREE COLLEGE OF ARTS and SCIENCE
(AUTONOMOUS) VUYYURU
ACEDAMIC YEAR 2022 - 2023

(An Autonomous college in the jurisdiction of Krishna University, Machilipatnam)

Economics	**ECOT21B**	**2021-2022**	**B.A.(E.M)**

MACROECONOMIC ANALYSIS

B.ASEMISTER–II

UNIT –IINTRODUCTION ANDNATIONAL INCOME

1.1AN INTRODUCTIONTO MACRO ECONOMICS
1.1.1   Definition, scopeandimportanceofMacroEconomics
1.1.2   EvolutionofMacroEconomics
1.1.3   MacroEconomicsParadoxes
1.1.4   Circular Flow ofIncomeandExpenditureinTwo,ThreeandFoursectorEconomy
1.2NATIONALINCOME
1.2.1   MeaninganddefinitionofNational Income–Marshall, Pigou,Fisher
1.2.2   National IncomeAggregates–GDP, GNP, NDP, NNP,NNPfc,PI,DI,P.CI, RNI, RPIC
1.2.3   Measurementof National Income–Product,Income andExpendituremethods
1.2.4   Concepts ofGreen Accounting
UNIT – IITHEROIESOFEMPLOYMENT
2.1THEORIESOFEMPLOYMENT
2.1.1   Classical Theoryof Employment
2.1.2   Say's LawofMarkets
2.1.3   KeynesianTheory ofEmployment
2.2THEORIESOFCONSUMPTION
2.2.1   AverageandMarginal propensitytoconsume
2.2.2   Keynes psychologicalLaw of Consumption
2.2.3   Briefreviewof Absolute, Relative,Life cycleand Permanent incomehypothesis

2.3THEORIESOFINVESTMENT
2.3.1   Marginal Efficiencyof Capital(MEC)
2.3.2   MultiplierPrinciple ConceptsanditsWorking
2.3.3   TheAccelerationprinciple
2.4AggregateDemandFunction–AlgebraicExplanation
2.5IS –LMCurves–Equations
2.6TheGoodsMarketandMoneyMarketEquilibrium–AlgebraicExplanation
UNIT IIIMONEYANDBANKING

3.1THEORYOFMONEY
3.1.1 Meaning, DefinitionandFunctionsofMoney
3.1.2 Gresham'sLaw
3.1.3 R.B.I ClassificationofMoney (NM_1, NM_2,
3.1.4 Fisher'sQuantity Theoryof Money
3.1.5 CambridgeApproach(Marshall,Pigou, RobertsonandKeynesEquation

3.2 THEORY OF BANKING

3.2.1 Definition and Types of Banking

3.2.2 Functions of Commercial Banks

3.2.3 Functions of Central Bank

3.2.4 Credit Control by Central Bank

3.2.5 Factors Contributing to the Growth of NBFC's

UNIT IV INFLATION AND TRADE CYCLES

4.1 THEORY OF INFLATION

4.1.1 Meaning. Definition and Concepts of Inflation

4.1.2 Demand Pull and Cost-Push inflation

4.1.3 Philip's Curve Hypothesis

4.1.4 Measurements of inflation- C.P.I and W.P.I

4.1.5 Causes and Effects of inflation

4.2 THEORY OF TRADE CYCLES

4.2.1 Trade Cycles Meaning and Definition

4.2.2 Phases of Trade Cycles

4.2.3 Causes of Trade Cycles

4.2.4 Measures to control Trade Cycles

UNIT – V FINANCE AND INSURANCE

5.1 THEORY OF FINANCE

5.1.1 Financial Assets and Financial Intermediates

5.1.2 Structure of Financial System

5.1.3 Functions of Money Market

5.1.4 Functions of Capital Market

5.1.5 Functions of Stock Exchange

5.1.6 Bombay Stock Exchange (BSE) and National Stock Exchange (NSE)

5.2 THEORY OF INSURANCE

5.2.1 Concept and Origin of Insurance

5.2.2 Types of Insurance

5.2.3 Importance of Insurance

AG&SG SIDDHARTHA DEGREE COLLEGE OF ARTS and SCIENCE (AUTONOMOUS) VUYYURU

ACEDAMIC YEAR 2021 - 2022

SEMESTER – 4 :: COURSE – 4

ECONOMIC DEVELOPMENT- INDIA AND ANDHRA PRADESH

Module – 1 Basic Features Basic characteristics of Indian Economy as a developing economy – Economic development since independence - Objectives and achievements of planning – Planning Commission/NITIAyog and their approaches to economic development - India's Rank in Global Human Development Index .

Module 2 National Income and Demography Trends in National income - Demographic trends - Poverty and Inequalities – Occupational Structure and Unemployment - Various Schemes of employment generation and eradication of poverty – Issues in Rural Development and Urban Development –Intra-state and Inter-state Labour Migration and unorganized sector Problems of Migrant Labour.

Module – 3 Agricultural and Industrial Developments Indian Agriculture – Agricultural Strategy and Agricultural Policy – Agrarian Crisis and land reforms – Agricultural credit – Minimum Support Prices -Malnutrition and Food Security - Indian Industry - Recent Industrial Policy – Make-in India – Start-up and Stand-up programmes – SEZs and Industrial Corridors - Economic Reforms and their impact - Economic initiatives by government of India during COVID - Atmanirbhar Bharat package.

Module –4 Indian Public Finance Indian Tax System and Recent changes – GST and its impact on Commerce and Industry – Centre, States financial relations- Recommendations of Recent Finance Commission – Public Expenditure and Public Debt - Fiscal Policy and Budgetary Trends

Module- 5 Andhra Pradesh Economy The basic characteristics of Andhra Pradesh economy after bifurcation in 2014 – Impact of bifurcation on the endowment of natural resources and state revenue – new challenges to industry and commerce - the new initiatives to develop infrastructure – Power and Transport - Information Technology and e-governance – Urbanization and smart cities – Skill development and employment –Social welfare programmes.

AG&SG SIDDHARTHA DEGREE COLLEGE OF ARTS and SCIENCE (AUTONOMOUS) VUYYURU

ACEDAMIC YEAR 2022 - 2023

COURSE– 5(Semester - IV)

STATISTICAL METHODS FOR ECONOMICS

NO. OF CREDITS: 4

Module – 1: Nature and Definition of Statistics Introduction to Statistics – Definition, scope, importance and limitations of Statistics – Primary and Secondary data- Census and Sampling techniques and their merits and demerits

Module – 2:Diagrammatic Analysis Collection of data - Schedule and questionnaire – Frequency distribution – Tabulation – diagram and graphic presentation of data – Histogram, Frequency Polygon, Cumulative Frequency Curves - Bar Diagrams and Pie Diagram

Module – 3:Measures of Central Tendency and Dispersion Measures of Central Tendency and Dispersion - Types of averages- Arithmetic Mean, Geometric Mean, Harmonic Mean – Median – Mode – Dispersion - Range, Quartile Deviation, Mean Deviation, Standard Deviation-Coefficient of Variation.

Module – 4:Correlation and Regression Correlation and Regression - Meaning, Definition and uses of Correlation- Types of Correlation- Karl Pearson's Correlation coefficient - Spearman's Rank CorrelationRegression Equations - utility of regression analysis – Demand forecasting.

Module – 5: Time Series and Index Numbers Time Series and Index Numbers: Definition and components of Time Series – Measurement of Time Series – Moving Average and the Least Squares Method – Index Numbers - Concepts of Price and Quantity Relatives – Laspeyer's, Paasche's and Fisher's Ideal Index Numbers – Uses and Limitations of Index Numbers.

Adusumilli Gopalakrishnaiah & Sugar Cane Growers Siddhartha Degree College ofArts & Science, Vuyyuru– 521165, Krishna District, Andhra Pradesh

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DEPARTMENT OF HISTORY

2022-2023
HIGHLIGHTED SYLLABUS OF B.A

Courses on Employability, Entrepreneurship and Skill-Development in the curriculum of all programs are highlighted as mentioned: Employability in yellow Color, Skill-Development in Sky blue colour and Entrepreneurship in Green colour

Employability   ▮

Skill-Development   ▮

Entrepreneurship   ▮

HISTORY		2022-23	B.A/HEP

Course -1

No. of Credits: 4

NO OF HOURS:-05   MAX MARKS:-70

(ANCIENT INDIAN HISTORY & CULTURE FROM INDUS VALLEY CIVILIZATION TO 13TH CENTURY A. D) (NEW SYLLABUS)

Unit – 1   **12 hrs**

1.1-Ancient Indian Civilization (from Circa 3000 BC to 6th BC):

1.2 Indus Valley Civilization - Salient Features

1.3   Vedic Age - Society, Polity, Economy, Culture during early and later Vedic period (On line)

Unit – II   **12 hrs**

2.1- Ancient Indian History & Culture (6th Century BC to 2nd Century AD):2.2-Doctrines and Impact of Jainism and Buddhism;

2.3- Mauryan Administration, Society, Economy & Culture - Ashoka's Dharma;

2.4- Kanishka's Contribution to Indian Culture (On line)

Unit – III   **12 hrs**

3.1-History & Culture of South India (2nd Century BC to 8 th Century AD):

3.2Sangam Literature; Administration, Society, Economy and Culture under Satavahanas

3.3 Cultural contribution of Pallavas (On line)

Unit – IV   **12 hrs**

4.1- India from 3rd century AD to 8th century AD: Administration, Society, Economy, Religion, Art, Literature and Science & Technology under Guptas – Samudragupta. 4.2-Cultural contribution of Harsha:

4.3 Arab Conquest of Sind and its Impact

Unit - V   **12 hrs**

5.1-History and Culture of South India (9th century AD to 13th century AD):

5.2 Local Self Government of Cholas

5.3 Administration, Society, Economy and Culture under Kakatiyas – RudrammaDevi

| HISTORY | HIST21B | 2022-23 | B.A/HEP |

SEMESTER-II
NO OF HOURS:-05   No. of Credits: 4
MAX MARKS:-70

MEDIEVAL INDIAN HISTORY & CULTURE (1206 A.D to 1764 A.D) (NEW SYLLABUS)

Unit- I   **15 hours**

Impact of Turkish Invasions – Balban, AllauddhinKhilji, Md. Bin Tughlaq - Administration, Society, Economy, Religion and Cultural developments under Delhi Sultanate (from 1206 to 1526 AD)

Unit – II   **15 hours**

Impact of Islam on Indian Society and Culture – Bhakti Movement; Administration, Society, Economy,
Religion and Cultural developments under Vijayanagara Rulers

Unit – III   **15 Hours**

Emergence of Mughal Empire – Babur – Sur Interregnum - Expansion & Consolidation of Mughal Empire – Akbar, Jahangir,Shah Jahan, Aurangazeb.

Unit – IV   **15 hours**

Administration, Economy, Society and Cultural Developments under the Mughals – Disintegration of Mughal Empire - Rise of Marathas under Shivaji

Unit _ V   **15 hours**

India under Colonial Hegemony : Beginning of European Settlements - Anglo- French Struggle – Conquest of Bengal by EIC

SEMESTER – III
Course code: **HIS-301**

MODERN INDIAN HISTORY & CULTURE (1764-1947 A. D

Unit – 1   **12 hrs**
1.1-Policies of Expansion –Warren Hastings, Cornwallis - Subsidiary Alliance
&Doctrine Of Lapse Causes & Results of 1857 Revolt – Lytton, Rippon, Curzon

Unit - II   **12 hrs**
2.1- Social, Religious & Self-Respect Movements – Raja Rammohan Roy,
2.2 - DayanandaSaraswathi, Swami Vivekananda, JyotibaPhule, Narayana Guru,
Periyar, Dr. B. R. Ambedkar

Unit -III 12 hrs
3.1- Causes for the growth of Nationalism - Freedom Struggle from 1885 to 1920:
3.2 - III Moderate Phase – Militant Phase: Vandemataram Movement - Home RuleMovement

   Unit – IV   **12 hrs**
4.1. Freedom Struggle from 1920 to 1947: Gandhiji's Role in the National Movement –
Revolutionary Movement – Subash Chandra Bose

Unit – V   **12 hrs**

Muslim League & the Growth of Communalism – Partition of India – Advent of Freedom - Integration of Princely States into Indian Union – SardarVallabhai Patel

HISTORY	PAPERCODE: HIST401	2022-23	B.A/HEP

SEMESTER – IV   **Course: IV**
 No. of Credits: 4
NO OF HOURS:-05   **MAX MARKS:-75**

HISTORY & CULTURE OF ANDHRA (FROM 1512 TO 1956 AD)

Unit – 1   **12 hrs**
1.1-Andhra through 16th& 19th Centuries AD:
1.2- Evolution of Composite Culture - The QutbShahis of Golkonda –Administration, Society &Economy – Literature & Architecture;
1.3- Advent of European and settlements in Andhra - Occupation of Northern Circars and Ceeded Districts – Early revolts against the British

Unit – II   **12 hrs**
2.1 Andhra under British rule: Administration – Land Revenue Settlements – Society – Education - Religion – Impact of Industrial Revolution on Economy – Peasantry & Famines – Contribution of Sir Thomas Munroe & C. P. Brown – Impact of 1857 Revolt in Andhra

Unit – III   **12 hrs**
3.1- Social Reform & New Literary Movements: KandukuriVeeresalingam, RaghupathiVenkataRathnam Naidu, GuruzadaApparao, KomarrajuVenkataLaxmana Rao.
3.2-New Literary Movements: RayaproluSubbarao, ViswanathaSathyanarayana, GurramJashua, BoyiBheemanna, Sri Sri

Unit – IV   **12 hrs**
4.1- Freedom Movement in Andhra (1885-1947):
4.2- Vandemataram Movement– Home Rule Movement in Andhra - Non-Cooperation Movement - AlluriSeetarama Raju &Rampa Revolt (1922-24) - Civil Disobedience Movement – Quit India Movement

Unit – V   **12 hrs**
   1.1 Movement for separate Andhra State (1953) and AP (1956):
   1.2 Causes – Andhra Maha Sabha –Conflict between Coastal Andhra &Rayalaseema – Sri Bagh Pact – work of various Committees – Martyrdom of PottiSriramulu – Formation of separate Andhra State (1953);
   1.3 Movement for formation of Andhra Pradesh (1956):
   1.4 VisalandhraMahasabha – Role of Communists – States Reorganization Committee – Gentlemen's Agreement – Formation of Andhra Pradesh

HISTORY	PAPERCODE: HIST402	2022-23	B.A/HEP

Course :V

No. of Credits: 4

NO OF HOURS :-05   **MAX MARKS:-75**

HISTORY OF MODERN WORLD (From 15th Cent. AD to 1945 AD) (NEW SYLLABUS)
1. .

Unit – 1   **12hrs**
Transformation from Medieval to Modern Era – Chief Characteristics; Glorious Revolution (1688) – Origin of Parliament Bill of Rights – Results

Unit – II   **12hrs**
American Revolution (1776); French Revolution (1789) – Causes, Course and Results

Unit - III   **12 hrs**
Unification of Italy; Unification of Germany

Unit – IV   **12hrs**
Communist Revolution in Russia; World War I: Causes – Results of the War – Paris Peace Conference; League of Nations

Unit - V   **12hrs**
World War II: Causes, Fascism & Nazism – Results; The United Nations Organization: Structure, Functions and Challeng

AG & SG SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE VUYYURU

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(2022– 2023)

III BA History Syllabus:: Semester – V /VI

Title of the Paper : TOURISM AND HOSPITALITY SERVICES 6B

Paper Code; SECHIS601

No.of Hours per week:5   **No. of Credits:4**

Unit: 1
Tourism – Definition – Nature and Scope – History of Tourism–Types of Tourism – Domestic and International Tourism – Causes of rapid growth of tourism – National Institute of Tourism and Hospitality Management

Unit: 2
Relationship between history and tourism - Major tourist spots in AP – Gandikota, Nagarjunakonda, Salihundam, Konaseema

Unit: 3
Characteristics of Hospitality Industry - Inflexibility, Intangibility, Perish ability- Types of Hospitality jobs – Hotel Manager, Hotel Receptionist, Restaurant Manager, Catering Assistant, Executive Chef etc - Concepts of Atithi Devo Bhavah - Types of hotels in India

Unit: 4
Duties, responsibilities & skills of front office staff – duties, responsibilities and skills of housekeeping staff - guest stay process in a hotel - major processes and stages associated with it

Unit: 5
Different types of services offered in selected Hotels/Motels/Restaurants - Room Service,
Catering Services -Different types of managerial issues - Service etiquettes

Course 7B: Tourism Guidance and Operating Skills

(Skill Enhancement Course (Elective), 4 Credits)

Paper Code: SECHIS602

MAX MARKS :-70   **NO OF HOURS:-05**

Unit: 1   **12hrs**

Meaning of tour guide - types of tour guide: heritage guide, nature guide, adventure guide, business guide, special interest guide etc – duties and responsibilities of guides -various roles of tour guide.

Unit: 2   **12hrs**

Guiding techniques: leadership skills, social skills, presentation skills, communication skills - Guide's personality skills: passion, empathy, enthusiasm, punctuality, humour etc - Personal hygiene and grooming – code of conduct.

Unit: 3   **12hrs**

Guest Relationship Management- Handling emergency situations- Medical, Personal, Official, VISA/Passport, Death, Handling Guest with special needs/Different Abilities/ Different age groups.

Unit: 4   **12hrs**

Conducting Tours: Pre-Tour Planning, Route Chart, Modes of Transportation, Security Measures, and Check list etc. - Conducting various types of tours- Relationship with Fellow Guides - Coordination with hospitality institutions.

Unit: 5   **12hrs**

Travel Agency and Tour operations – Difference between Travel Agent and Tour operator – Functions of Tour Operator – Types of Tour Operations and of Tour Operators - A brief study of tour operating agencies like APTDC, Southern Travels etc.

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DEPARTMENT OF HINDI

2022-2023

HIGHLIGHTED SYLLABUS

Courses on Employability and Skill-Development in the curriculum of all programs are highlighted as mentioned: Employability in yellow Color, Skill-Development in Sky blue colour .

Employability

Skill-Development

HINDI	HINT11A	2022-23	B.A., B.Com., B.B.A., & B.Sc.

SEMESTER–I   **Credits – 3**

HINDI - I

COURSE OUTCOMES:

CO1 - मानव मूल्यों को पहचानकर समाज कल्याण हेतु देने के लिए तैयार रहना ।

CO2 - आधुनिक युग की भावनाओं को पहचानकर सामाजिक समस्याओं का सामना करते हुए, निरंतर आगे बढना ।

CO3 - विद्यार्थियों को शब्दावली से एक भाषा से दुसरे भाषा का अनुवाद कर सकता है ।

CO4 - छात्रों को इस व्याकरण के द्वारा भाषा में निपुणता आती हैं ।

CO5 - छात्रों के इस पत्र-लेखन द्वारा लिखित कार्य बढता है और संप्रेषण का विकास होता है ।

I. **गद्य संदेश :**

    1. साहित्य की महत्ता

    2. सच्ची वीरता

    3. मित्रता

II. **कथा – लेक :**

    1. मुक्तिधन

    2. गूदड साई

    3. उसने कहा था

III. **व्याकरण :** कार्यालयीन हिन्दी शब्दावली

        (हिन्दी से अंग्रेजी में बदलना तथा अंग्रेजी से हिन्दी में बदलना)

IV. **व्याकरण :** लिंग, वचन, उल्टे शब्द, काल, वाच्य, वाक्य शुद्ध कीजिए

V. **पत्र-लेखन :** पत्र-लेखन (मित्र को पत्र, पिताजी को पत्र)

Recommended Books:

1. गद्य संदेश - Dr. V.L.Narasimham Siva Koti

2. कथा लेक - Dr. Ghana Shyam

HINDI	HINT01A	2022-'23	B.A., B.Com., B.B.A., & B.Sc.

SEMESTER–III / IV   **Credits – 3**

HINDI - III

COURSE OUTCOMES:

CO1 - दोहों के द्वारा विध्यार्थियों में समाज सुधारता, मानव मूल्य बढते हैं ।

CO2 - हिन्दी साहित्य का इतिहास के द्वारा हिन्दी भाषा की प्रामुख्यता और कविताओं की प्रामुख्यता मिल जाती हैं ।

CO3 - समाज कल्याण विषयों को समझकर अपना ज्ञान बढाते हैं ।

CO4 - समाज में भाषा पर प्रामूख्यत, भाषा में ज्ञान प्राप्त करके, दूसरों से आसानी से संप्रोषित करना सीखेंगे ।

CO5 - सरकारी व्यवस्थाओं को लेख लिखना, भाषा की विशेषता, समाज में सरकारी भाषा सीखकर दूसरों को आदर्शवान बन सकेंगे ।

I. काव्य दीप :

कबीरदास   - साखी – 1-10,

सूरदास   - बालवर्णन,

मात्रु भूमि   - मैथिलीशरण गुप्त,

तोडती पत्थर   - सूर्यकांत त्रिपाठी निराला

गीत फरोश   - भवानी प्रसाद मिश्र

II. हिन्दी साहित्य का इतिहास :

काल विभांजन–आचार्य रामचन्द्र शुक्ल जी के अनुसार,

भकित कालः ज्ञानाश्रयी शाखा – कबीर,

प्रेमाश्रयी शाखा – जायसी

III. साधारण निबन्ध : समाचार पत्र, पर्यावरण और प्रदूषण, बैकारी की समस्या, कंप्यूटर

IV. अनुवाद : अनुवाद अभ्यास

V. प्रयोजनमूलक हिन्दी : परिपत्र, कार्यालय ज्ञापन, राष्ट्रभाषा हिन्दी

Recommended Books:

1. गद्य संदेश - Dr. V.L.Narasimham Siva Koti

2. कथा लेक - Dr. Ghana Shyam

SYLLABUS:

I .गध्य संदेश:

1. संस्कृति और साहित्य का परस्पर संबंध
2. भारत एक है
3. एच.आई.वी. / एड्स

II. कथा लोक

1. ज़रिया
2. भूख हड़ताल
3. परमात्मा का कुत्ता

III .व्याकरण:कार्यालयीन हिन्दी शब्दावली

(हिन्दी से अंग्रेजी में बदलना तथा अंग्रेजी से हिन्दी में बदलना)

IV. **व्याकरण:** संधि विच्छेद ,वाक्य प्रयोग

V.**पत्र लेखन:**आवेदन पत्र,पुस्तक विक्रेता के नाम पत्र

Recommended Books:
1. **गध्य संदेश**- Dr. V. L.Narasimham Siva Koti
2. **कथा लोक**- Dr. Ghana Shyam

Adusumilli Gopala krishnaiah & Sugar Cane Growers Siddhartha Degree College ofArts & Science, Vuyyuru, Krishna District, Andhra Pradesh
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DEPARTMENT OF MATHEMATICS

HIGHLIGHTED SYLLABUS OF MATHEMATICS
2022-2023

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability   🟨

Skill-Development   🟦

Entrepreneurship   🟩

A. G & S. G Siddhartha Degree College of Arts and Science (Autonomous), Vuyyuru

(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)
NAAC reaccredited at 'A' level
Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: REAL ANALYSIS   **Semester: II**

Course Code	**MAT T201**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	5	CIA Marks	25
No. of Lecture Hours / Week	6	Semester End Exam Marks	75
Total Number of Lecture Hours	75	Total Marks	100
Year of Introduction :2021-22	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Course Syllabus:

UNIT – I (12 Hours) REAL NUMBERS:

The algebraic and order properties of R, Absolute value and Real line, Completeness property of R, Applications of supremum property; intervals. (No question is to be set from this portion).

Real Sequences:

Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and Convergent sequence. The Cauchy's criterion, properly divergent sequences, Monotone sequences, Necessary and Sufficient condition for Convergence of Monotone Sequence, Limit Point of Sequence, Subsequences and the Bolzano-weierstrass theorem – Cauchy Sequences – Cauchy's general principle of convergence theorem.

UNIT –II (12 Hours) INFINITIE SERIES:

Series: Introduction to series, convergence of series. Cauchy's general principle of convergence for series tests for convergence of series, Series of Non-Negative Terms.

1. P-test
2. Cauchy's n^{th} root test or Root Test.
3. D'-Alembert's Test or Ratio Test.
4. Alternating Series – Leibnitz Test.

Absolute convergence and conditional convergence.

UNIT – III (12 Hours) CONTINUITY :

Limits : Real valued Functions, Bounded ness of a function, Limits of functions. Some extensions of the limit concept, Infinite Limits. Limits at infinity. (No question is to be set from this portion).

Continuous functions: Continuous functions, Combinations of continuous functions, Continuous Functions on intervals, uniform continuity.

UNIT – IV (12 Hours) DIFFERENTIATION AND MEAN VALUE THEORMS:

The derivability of a function, on an interval, at a point, Derivability and continuity of a function, Graphical meaning of the Derivative, Mean value Theorems; Rolle's Theorem, Lagrange's Theorem, Cauchy's Mean value Theorem

UNIT – V (12 Hours) RIEMANN INTEGRATION :

Riemann Integral, Riemann integral functions, Darboux theorem. Necessary and sufficient condition for R – integrability, Properties of integrable functions, Fundamental theorem of integral calculus, integral as the limit of a sum, Mean value Theorems.

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Real Analysis and its applications / Problem Solving.

Text Book:

Introduction to Real Analysis by Robert G.Bartle and Donlad R. Sherbert, published by John Wiley.
Reference Books:

1. A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, published by S. Chand & Company Pvt. Ltd., New Delhi.

2. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisinghania, published by S. Chand & Company Pvt. Ltd., New Delhi.

A. G & S. G Siddhartha Degree College of Arts and Science (Autonomous), Vuyyuru

(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

NAAC reaccredited at 'A' level
Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: REAL ANALYSIS   **Semester: IV**

Course Code	**MAT - 401**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	5	CIA Marks	30
No. of Lecture Hours / Week	6	Semester End Exam Marks	70
Total Number of Lecture Hours	75	Total Marks	100
Year of Introduction :2021-22	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Course Syllabus:

UNIT – I (12 Hours) REAL NUMBERS:

The algebraic and order properties of R, Absolute value and Real line, Completeness property of R, Applications of supremum property; intervals. (No question is to be set from this portion).

Real Sequences:

Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and Convergent sequence. The Cauchy's criterion, properly divergent sequences, Monotone sequences, Necessary and Sufficient condition for Convergence of Monotone Sequence, Limit Point of Sequence, Subsequences and the Bolzano-weierstrass theorem – Cauchy Sequences – Cauchy's general principle of convergence theorem.

UNIT –II (12 Hours) INFINITIE SERIES:

Series: Introduction to series, convergence of series. Cauchy's general principle of convergence for series tests for convergence of series, Series of Non-Negative Terms.

1. P-test
2. Cauchy's n^{th} root test or Root Test.
3. D'-Alembert's Test or Ratio Test.
4. Alternating Series – Leibnitz Test.

Absolute convergence and conditional convergence.

UNIT – III (12 Hours) <mark>CONTINUITY :</mark>

Limits : Real valued Functions, Bounded ness of a function, Limits of functions. Some extensions of the limit concept, Infinite Limits. Limits at infinity. (No question is to be set from this portion).

Continuous functions: Continuous functions, Combinations of continuous functions, Continuous Functions on intervals, uniform continuity.

UNIT – IV (12 Hours) <mark>DIFFERENTIATION AND MEAN VALUE THEORMS:</mark>

The derivability of a function, on an interval, at a point, Derivability and continuity of a function, Graphical meaning of the Derivative, Mean value Theorems; Rolle's Theorem, Lagrange's Theorem, Cauchy's Mean value Theorem

UNIT – V (12 Hours) <mark>RIEMANN INTEGRATION :</mark>

Riemann Integral, Riemann integral functions, Darboux theorem. Necessary and sufficient condition for R – integrability, Properties of integrable functions, Fundamental theorem of integral calculus, integral as the limit of a sum, Mean value Theorems.

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Real Analysis and its applications / Problem Solving.

Text Book:

Introduction to Real Analysis by Robert G.Bartle and Donlad R. Sherbert, published by John Wiley.
Reference Books:

1. A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, published by S. Chand & Company Pvt. Ltd., New Delhi.

2. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisinghania, published by S. Chand & Company Pvt. Ltd., New Delhi.

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Autonomous -ISO 9001 – 2015 Certified

Title of the Paper : LINEAR ALGEBRA   **Semester: IV**

Course Code	**MAT - 402**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	5	CIA Marks	30
No. of Lecture Hours / Week	6	Semester End Exam Marks	70
Total Number of Lecture Hours	75	Total Marks	100
Year of Introduction :2021-22	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Course Syllabus:

UNIT – I (12 Hours) <mark>Vector Spaces-I:</mark>

Vector Spaces, General properties of vector spaces, n-dimensional Vectors, addition and scalar multiplication of Vectors, internal and external composition, Null space, Vector subspaces, Algebra of subspaces, Linear Sum of two subspaces, linear combination of Vectors, Linear span Linear independence and Linear dependence of Vectors.

UNIT –II (12 Hours) <mark>Vector Spaces-II:</mark>

Basis of Vector space, Finite dimensional Vector spaces, basis extension, co-ordinates, Dimension of a Vector space, Dimension of a subspace, Quotient space and Dimension of Quotient space.

UNIT –III (12 Hours) <mark>Linear Transformations:</mark>

Linear transformations, linear operators, Properties of L.T, sum and product of LTs, Algebra of Linear Operators, Range and null space of linear transformation, Rank and Nullity of linear transformations – Rank – Nullity Theorem.

UNIT –IV (12 Hours) <mark>Matrix :</mark>

Matrices, Elementary Properties of Matrices, Inverse Matrices, Rank of Matrix, Linear Equations, Characteristic equations, Characteristic Values & Vectors of square matrix, Cayley – Hamilton Theorem.

UNIT –V (12 Hours) <mark>Inner product space:</mark>

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle Inequality, Parallelogram law, Orthogonality, Orthonormal set, complete orthonormal set, Gram – Schmidt orthogonalization process. Bessel's inequality and Parseval's Identity.

Co-Curricular Activities (15 Hours)

Seminar/ Quiz/ Assignments/ Linear algebra and its applications / Problem Solving.

Text Book:

Linear Algebra by J.N. Sharma and A.R. Vasista, published by Krishna Prakashan Mandir, Meerut- 250002.

Reference Books :

1. Matrices by Shanti Narayana, published by S.Chand Publications.

2. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low priced edition), New Delhi.

3. Linear Algebra by Stephen H. Friedberg et. al. published by Prentice Hall of India Pvt. Ltd.4th Edition, 2007.

A.G & S.G SIDDHARTHA DEGREE COLLEGE: VUYYURU-521165

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MATHEMATICS	**MAT-601GE**	**w.e.f.2020-21**	**III B.Sc**

SEMESTER-VI   **PAPER-VII**   **Max.Marks:70**

Hours/ Week: 5   **No.of Credits: 5**

ELECTIVE–VII-(B); NUMERICAL ANALYSIS

UNIT- I: **10 hours**

Errors in Numerical computations: Errors and their Accuracy, Mathematical Preliminaries, Errors and their Analysis, Absolute, Relative and Percentage Errors, A general error formula, Error in a series approximation.

UNIT – II: **12 hours**

Solution of Algebraic and Transcendental Equations: The bisection method, the iteration method, the method of false position, Newton Raphson method, Generalized Newton Raphson method.

UNIT – III: **12 hours**

Finite Differences and Interpolation: Errors in polynomial interpolation, Finite Differences, Forward differences, Backward differences, Symbolic relations, Detection of errors by use of Differences Tables, Differences of a polynomial, Newton's formulae for interpolation

UNIT – IV: **12 hours**

Central Differences: Central Differences, Central Difference Interpolation Formulae, Gauss's central difference formulae, Stirling's central difference formula, Bessel's Formula, Everett's Formula.

UNIT – V: **14 hours**

Interpolation – III:

Interpolation with unevenly spaced points, Lagrange's formula, Error in Lagrange's formula, Divided differences and their properties, Relation between divided differences and forward differences, Relation between divided differences and backward differences Relation between divided differences and central differences, Newton's general interpolation Formula, Inverse interpolation.

Reference Books:

1. Numerical Analysis by S.S.Sastry, published by Prentice Hall of India Pvt. Ltd., New Delhi. (Latest Edition)
2. Numerical Analysis by G. Sankar Rao published by New Age International Publishers, New – Hyderabad.
3. Finite Differences and Numerical Analysis by H.C Saxena published by S. Chand and Company, Pvt. Ltd., New Delhi.
4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K. Jain.

Suggested Activities:

Seminar/ Quiz/ Assignments

| **MATHEMATICS** | **MAT-602CE** | **w.e.f.2020-21** | **III B.Sc** |

SEMESTER-VI **PAPER-VIII** **Max.Marks:70**

Hours/ Week: 5 **No.of Credits: 5**

Cluster Elective- VIII-A-1: INTEGRAL TRANSFORMS

UNIT–1:Application of Laplace Transform to solutions of Differential Equations 12 hrs

Solutions of ordinary Differential Equations. Solutions of Differential Equations with constants co-efficient Solutions of Differential Equations with Variable co-efficient

UNIT – 2:Application of Laplace Transform : - **12 hrs**

Solution of simultaneous ordinary Differential Equations. Solutions of partial Differential Equations.

UNIT – 3:Application of Laplace Transforms to Integral Equations : - **12 hrs**

Integral Equations-Abel's, Integral Equation-Integral Equation of Convolution Type, Integro Differential Equations. Application of L.T. to Integral Equations.

UNIT –4: Fourier Transforms-I : - **12 hrs**

Definition of Fourier Transform – Fourier'sine Transform – Fourier cosine Transform – Linear Property of Fourier Transform – Change of Scale Property for Fourier Transform – sine Transform and cosine transform shifting property – modulation theorem.

UNIT – 5: Fourier Transform-II : - **12 hrs**

Convolution Definition – Convolution Theorem for Fourier transform – parseval's Indentify Relationship between Fourier and Laplace transforms – problems related to Integral Equations.

Finte Fourier Transforms : -

Finte Fourier Sine Transform – Finte Fourier Cosine Transform – Inversion formula for sine and cosine Transforms only statement and related problems.

Reference Books :-

1. Integral Transforms by A.R. Vasistha and Dr. R.K. Gupta Published by Krishna Prakashan Media Pvt. Ltd. Meerut.

2. A Course of Mathematical Analysis by Shanthi Narayana and P.K. Mittal, Published by S. Chand and Company pvt. Ltd., New Delhi.

3. Fourier Series and Integral Transforms by Dr. S. Sreenadh Published by S.Chand and Company Pvt. Ltd., New Delhi.

4. Lapalce and Fourier Transforms by Dr. J.K. Goyal and K.P. Gupta, Published by Pragathi Prakashan, Meerut.

5. Integral Transforms by M.D. Raising hania, - H.C. Saxsena and H.K. Dass Published by S.Chand and Company pvt. Ltd., New Delhi.

Suggested Activities:

Seminar/ Quiz/ Assignments

MATHEMATICS	MAT-603CE	w.e.f.2020-21	III B.Sc

SEMESTER-VI	PAPER-VIII	Max.Marks:70
Hours/ Week: 5		No.of Credits: 5

ELECTIVE – VIII-A-2: ADVANCED NUMERICAL ANALYSIS

Unit – I Curve Fitting: 10 Hours

Least – Squares curve fitting procedures, fitting a straight line, Polynomial fitting,

Curve fitting by a power functions and exponential function.

UNIT- II Numerical Differentiation: 12 hours

Derivatives using Newton's forward difference formula, Newton's backward difference formula, Derivatives using central difference formula, stirling's interpolation formula, Newton's divided difference formula, Maximum and minimum values of a tabulated function.

UNIT- III Numerical Integration: 12 hours

General quadrature formula, Trapezoidal rule, Simpson's 1/3 – rule, Simpson's 3/8 – rule, Boole's rule and Weddle's rules (only problems),

UNIT – IV Solutions of simultaneous Linear Systems of Equations: 14 hours

Solution of linear systems – Direct methods, Matrix inversion method, Gaussian elimination methods, Gauss-Jordan Method , Method of factorization. Iterative methods – Jacobi's method, Gauss-siedal method.

UNIT – V Numerical solution of ordinary differential equations: 12 Hours

Introduction, Solution by Taylor's Series, Picard's method of successive approximations, Euler's method, Modified Euler's method, Runge – Kutta methods.

Reference Books :

1. Numerical Analysis by S.S.Sastry, published by Prentice Hall India (Latest Edition).

2. Numerical Analysis by G. Sankar Rao, published by New Age International Publishers, Hyderabad.

3. Finite Differences and Numerical Analysis by H.C Saxena published by S. Chand and Company, Pvt. Ltd., New Delhi.

4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K. Jain.

Suggested Activities:

Seminar/ Quiz/ Assignments

A . G &S . G Siddhartha Degree College of Arts and Science (Autonomous), Vuyyuru

(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

MATHEMATICS	MAT T11A	2022-23	B.Sc (MPC, MPCS, MCCS, MSCS)

DIFFERENTIAL EQUATIONS

SEMESTER-I   **No of Credits: 5**

UNIT-I: DIFFERENTIAL EQUATIONS OF FIRST ORDER& FIRST DEGREE(12Hrs)
Linear DifferentialEquations
Differential Equations Reducible to Linear Form, Bernoulli's differentialequations.
Exact DifferentialEquations
IntegratingFactors,1/Mx+Ny,1/Mx-Ny,$e^{\int f(x)}dx$, $e^{\int g(y)}dy$,andInspectionmethod
Change ofVariables

UNIT-II: ORTHOGONAL TRAJECTORIES &DIFFERENTIAL EQUATIONS OF FIRST ORDER BUT NOT FIRST DEGREE(12Hrs)
OrthogonalTrajectories
Self-OrthogonalTrajectories
Equations solvable forp
Equations solvable fory
Equations solvable forx
Equations Homogeneous in X & Y
Equations that do not contain x (ory)
Clairaut's Equation and Equations reducible to clairaut'sform.

UNIT – III: Higher order lineardifferentialequations-I   (12Hrs)
Solution of homogeneous linear differential equations of order n with constantcoefficients
Solution of the non-homogeneous linear differential equations with constant
        coefficients by means of polynomialoperators.
General Solution off(D)y=0
General Solution of f(D)y=Q when Q is a function ofx.
1/f(D) is Expressed as partial fractions.
P.I. of f (D) y = Q when $Q=be^{ax}$
P.I. of f (D) y = Q when Q is b sinax or bcosax.

UNIT – IV: Higher order lineardifferentialequations-II   (12Hrs)
Solution of the non-homogeneous linear differential equations with constantcoefficients.
P.I. of f (D) y = Q when $Q=bx^{k}$
P.I. of f (D) y = Q when $Q=e^{ax}V$
P.I. of f (D) y = Q when Q=xV

P.I. of f (D) y = Q when $Q= x^{m}V$where v = sin bx andcosbx

UNIT-V: Higher order DifferentialEquations–III   (12Hrs)
The Cauchy-EulerEquation.
Linear differential Equations with non-constant coefficients
Method of Variation of parameters.

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Title of the Paper: ABSTRACT ALGEBRA   **Semester: III**

Course Code	**MAT - 301**	Course Delivery Method	Class Room / Blended Mode - Both
Credits	5	CIA Marks	30
No. of Lecture Hours / Week	6	Semester End Exam Marks	70
Total Number of Lecture Hours	75	Total Marks	100
Year of Introduction :2021-22	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Course Syllabus:

UNIT – I: GROUPS: **(12 Hours)**

Binary Operation – Algebraic structure – semi group- monoid – Group definition and elementary properties

Finite and Infinite groups – examples – order of a group, Composition tables with examples.

UNIT – II: SUB - GROUPS: **(12 Hours)**

Complex Definition – Multiplication of two complexes Inverse of a complex-Subgroup definition- examples-criterion for a complex to be a subgroups. Criterion for the product of two subgroups to be a subgroup-union and Intersection of subgroups.

Co-sets and Lagrange's Theorem :

Cosets Definition – properties of Cosets–Index of a subgroups of a finite groups–Lagrange's Theorem.

UNIT –III: NORMAL SUBGROUPS :   **(12 Hours)**

Definition of normal subgroup – proper and improper normal subgroup–Hamilton group – criterion for a subgroup to be a normal subgroup – intersection of two normal subgroups – Sub group of index 2 is a normal sub group –quotient group – criteria for the existence of a quotient group.

& S.G Siddhartha Degree College of Arts and Science (Autonomous), Vuyyuru

CBCS/ SEMESTER SYSTEM

(w.e.f   2021-22)

ANALYTICAL SKILLS

Semester – III   **B.A/ B. Com/ B. Sc**   **Total 30 Hrs**

Time : 2 Hours   **Max. Marks : 50M**

UNIT – 1: (10 Hours)

Arithmetic ability: Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD (HCF).

Verbal Reasoning: Number Series, Coding & Decoding, Blood relationship, Clocks, Calendars.

UNIT – 2: (10 Hours)

Quantitative aptitude: Averages, Ratio and proportion, Problems on ages, Time-distance – speed.

Business computations: Percentages, Profit & loss, Partnership, simple compound interest.

UNIT – 3: (07 Hours)

Data Interpretation: Tabulation, Bar Graphs, Pie Charts, line Graphs. Venn diagrams.

Recommended Co-Curricular Activities (03 hrs**)**

Surprise tests / Viva-Voice / Problem solving/Group discussion.

Text Book:

Quantitative Aptitude for Competitive Examination by R.S. Agrawal, S.Chand Publications.

Reference Books

1. Analytical skills by Showick Thorpe, published by S Chand And Company Limited, Ramnagar, New Delhi-110055
2. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.
3. Quantitative Aptitude for Competitive Examination by Abhijit Guha, Tata Mc Graw Hill Publications.

A.G & S.G SIDDHARTHA DEGREE COLLEGE OF ARTS AND SCIENCE, VUYYURU-521165, KRISHNA Dt, A.P.

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Title of the Paper: Analytical Skills   **Semester: III**

Course Code	ANS - 301	Course Delivery Method	Class Room / Blended Mode - Both
Credits	2	CIA Marks	0
No. of Lecture Hours / Week	2	Semester End Exam Marks	50
Total Number of Lecture Hours	30	Total Marks	50
Year of Introduction :2021-22	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

UNIT – 1   **6 Hrs**

Test of Reasoning – I:- Coding – Decoding, Direction Test, Interchange of Signs, Logical Venn diagrams, Series Puzzles.

UNIT – 2   **6 Hrs**

Test of Reasoning – II: - Analogies of numbers and Alphabets completion of blank spaces following the pattern in A: B: C: D relationship odd thing out; Missing number in a sequence or a series.

UNIT – 3   **6 Hrs**

Arithmetic ability:- Algebraic operations BODMAS, Fractions, Divisibility rules, LCM and GCD (HCF).

Date, Time and Arrangement Problems: Calendar Problems, Clock Problems, Blood Relationship.

UNIT – 4   **6 Hrs**

Quantitative aptitude: - Averages, Ration and proportion, Problems on ages, Time-distance-speed.

UNIT – 5   **6 Hrs**

Business computations:- Percentages, Profit &loss, Partnership, simple, compound interest.

Reference Books:

1. Quantitative Aptitude for Competitive Examination by R S Agrawal, S.Chand publications.

2. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.

3. Quantitative Aptitude: Numerical Ability (Fully Solved) Objective Questions, Kiran Prakashan, Pratogitaprakasan, Kic X, Kiran Prakasan publishers

4. Quantitative Aptitude for Competitive Examination by Abhijit Guha, Tata Mc Graw hill Publications.

5. Old question Paper of the exams conducted by (Wipro, TCS, Infosys, Etc) at their recruitment process, source-Internet.

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MATHEMATICS   MAT-501C   w.e.f 2020-21   III B.Sc (MPC, MPCs, MCCs)

SEMESTER-V   **PAPER-V**   **Max.Marks:70**

Hours/ Week: 5   **No. of Credits: 5**

VECTOR CALCULUS & RING THEORY

UNIT – 1: VECTOR DIFFERENTIATION: -   **(12 hrs)**

Vector Differentiation, Ordinary derivatives of vectors, Differentiability, Gradient, divergence, Curl operators, Formulae Involving these operators.

UNIT – 2: VECTOR INTEGRATION: -   **(12 hrs)**

Line Integral, Surface Integral and Volume integral with examples.

UNIT – 3: VECTOR INTEGRATION APPLICATIONS: -   **(12 hrs)**

Theorems of Gauss and Stokes, Green's theorem in plane and applications of these theorems.

UNIT – 4: RINGS-I: -   **(12 hrs)**

Definition of Ring and basic properties, Boolean Rings, divisors of zero and cancellation laws Rings, Integral Domains, Division Ring and Fields, The characteristic of a ring – The characteristic of an Integral Domain, The characteristic of a Field. Sub Rings, Ideals

UNIT – 5: RINGS-II: -   **(12 hrs)**

Definition of Homomorphism – Homorphic Image – Elementary Properties of Homomorphism – Kernel of a Homomorphism – Fundamental theorem of Homomorphism

Maximal Ideals – Prime Ideals.

Reference Books:-

1. Abstract Algebra by J. Fralieh, Published by Narosa Publishing house.

2. Vector Calculus by Santhi Narayana, Published by S. Chand & Company Pvt. Ltd., New Delhi.

3. A text Book of B.Sc., Mathematics by B.V.S.S.Sarma and others, published by S. Chand & Company Pvt. Ltd., New Delhi.

4. Vector Calculus by R. Gupta, Published by Laxmi Publications.

5. Vector Calculus by P.C. Matthews, Published by Springer Verlag publicattions.

6. Rings and Linear Algebra by Pundir & Pundir, Published by Pragathi Prakashan.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Ring theory and its applications

A.G & S.G SIDDHARTHA DEGREE COLLEGE: VUYYURU-521165

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MATHEMATICS	**MAT-502C w.e.f 2020-21**	**III B.Sc (MPC, MPCs, MCCs)**

SEMESTER-V	**PAPER-VI**	**Max.Marks:70**
Hours/ Week: 5		**No. of Credits: 5**

LINEAR ALGEBRA

UNIT –I Matrix: (12 hrs)

Matrices, Elementary Properties of Matrices, Triangular form, Echelon form, Normal form Inverse Matrices, Non – Singular form, Rank of Matrix, Linear Equations, Characteristic Roots, Characteristic Vectors of square Matrix, Cayley – Hamilton Theorem.

UNIT – II Vector Spaces-I: (12 hrs)

Vector Spaces, General properties of vector spaces, n-dimensional Vectors, addition and scalar multiplication of Vectors, internal and external composition, Null space, Vector subspaces, Algebra of subspaces, Linear Sum of two subspaces, linear combination of Vectors, Linear span Linear independence and Linear dependence of Vectors.

UNIT –III Vector Spaces-II: (12 hrs)

Basis of Vector space, Finite dimensional Vector spaces, basis extension, co-ordinates, Dimension of a Vector space, Dimension of a subspace, Quotient space and Dimension of Quotient space.

UNIT –IV Linear Transformations: (12 hrs)

Linear transformations, linear operators, Properties of L.T, sum and product of LTs, Algebra of Linear Operators, Range and null space of linear transformation, Rank and Nullity of linear transformations – Rank – Nullity Theorem.

UNIT –V Inner product space: (12 hrs)

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle in Inequality, Parallelogram law, Orthogonality, Orthonormal set, complete orthonormal set, Gram – Schmidt orthogonalisation process. Bessel's inequality and Parseval's Identity.

Reference Books:

1. Linear Algebra by J.N. Sharma and A.R. Vasista, published by Krishna Prakashan Mandir, Meerut- 250002.
2. Matrices by Shanti Narayana, published by S.Chand Publications.
3. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low priced edition), New Delhi.
4. Linear Algebra by Stephen H. Friedberg et al published by Prentice Hall of India Pvt. Ltd. 4th Edition 2007.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on "Applications of Linear algebra Through Computer Sciences"

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DEPARTMENT OF PHYSICS

HIGHLIGHTED SYLLABUS OF PHYSICS

2022-2023

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability   🟨

Skill-Development   🟦

Entrepreneurship   🟩

DEPARTMENT OF PHYSICS
2022-23
Title of the Paper: MECHANICS, WAVES AND OSCILLATIONS

Course Type: Core (TH) SEMESTER: I Max.Time: 3 Hours

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**1.Mechanics of Particles** (5 hrs) Review of Newton's Laws of Motion, Motion of variable mass system, Multistage rocket, Concept of impact parameter, scattering cross-section, Rutherford scattering-Derivation. **2.Mechanics of Rigid bodies** (7 hrs) Rigid body, rotational kinematic relations, Equation of motion for a rotating body, Angular momentum and Moment of inertia tensor, Euler equations, Precession of a spinning top, Gyroscope, Precession of the equinoxes	12
II	**3.Celestial mechanics** Central force - definition and examples, characteristics of central forces, conservative nature of central forces, Equation of motion under a central force **4. Orbital mechanics** Kepler's laws of planetary motion- Proofs, Motion of satellites – escape velocity, orbital velocity, Basic idea of Global Positioning System (GPS)	12
III	**5.Frames of reference and transformation** (5 hrs) Introduction to relativity, Frames of reference - Galilean transformations, absolute frames, Michelson-Morley experiment & negative result. **6. Consequences of relativistic transformations** (7 hrs) Postulates of Special theory of relativity, Lorentz transformation, time dilation, length contraction, variation of mass with velocity, Einstein's mass-energy relation	12
IV	**7.Undamped, Damped and Forced oscillations**: (07 hrs) Simple harmonic oscillator, damped harmonic oscillator, forced harmonic oscillator - differential equations and its solutions, Resonance, Logarithmic decrement, Relaxation time and Quality factor. **8.Fourier analysis (05 hrs)**	12

	Fourier theorem (Statement & limitations), evaluation of the Fourier coefficients using Fourier's theorem, analysis of periodic wave functions - square wave, triangular wave.	
V	**9.Vibrating Strings**: (07 hrs) Transverse wave propagation along a stretched string, General solution of wave equation and its significance, Modes of vibration of stretched string clamped at ends, Overtones and Harmonics. **10.Ultrasonics**: (05 hrs) Ultrasonics, General Properties of ultrasonic waves, Production of ultrasonics by piezoelectric and magnetostriction methods, Detection of ultrasonics, Applications of ultrasonic waves, SONAR	12

EXPERIMENTS LIST:

1. Young's modulus of the material of a bar (scale) by uniform bending

2. Young's modulus of the material a bar (scale) by non- uniform bending

3. Surface tension of a liquid by capillary rise method

4. Simple pendulum- normal distribution of errors-estimation of time period and the error of the mean by statistical analysis

5. Determination of 'g' by compound/bar pendulum

6. Verification of laws of vibrations of stretched string –Sonometer

7. Bifilar suspension –Moment of inertia of a regular rectangular body.

8. Rigidity modulus of material of a wire-Dynamic method (Torsional pendulum)

9. Volume resonator experiment

10. Viscosity of liquid by the flow method (Poiseuille's method)

11. Determination of the force constant of a spring by static and dynamic method. Coupled oscillators

12. Determination of frequency of a bar –Melde's experiment.

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DEPARTMENT OF PHYSICS
2022-23
Title of the Paper: THERMODYNAMICS AND RADIATION PHYSICS

Course Type: Core (TH)   SEMESTER: III   **Max.Time**: 3 Hours

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**1. Kinetic Theory of gases**-Introduction, Maxwell's law of distribution of molecular velocities, Mean free path, Degrees of freedom, Principle of equipartition of energy (Qualitative ideas only), **2. Transport phenomenon in ideal gases**: viscosity, Thermal conductivity and diffusion of gases.	12
II	**3. Introduction to Thermodynamics** Introduction- Isothermal and Adiabatic processes - Work done in these processes, Heat engines - Reversible and irreversible processes, Carnot's engine and its efficiency, Second law of thermodynamics, Carnot's theorem, Thermodynamic scale of temperature and its identity with perfect gas scale. **4. Entropy** Entropy and its Physical significance, change in entropy in reversible and irreversible processes; Entropy and disorder-Entropy of Universe; Temperature-Entropy (T-S) diagram and its uses, change of entropy when ice changes into steam (**Qualitative**).	12
III	**5Thermodynamic potentials** - Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy and their significance, Derivation of Maxwell's thermodynamic relations from thermodynamic potentials, **6.Applications of Maxwell's thermodynamic relations**: (i) Clausius-Clapeyron's equation (ii) Value of C_P- C_V (iii) Value of C_P/C_V (iv) Joule-Kelvin coefficient for ideal and Van der Waals' gases	12

IV	**Low temperature Physics**: (12hrs) **7. Methods for producing very low temperatures**: Joule Kelvin effect - Porous plug experiment, Joule expansion, Distinction between adiabatic and Joule Thomson expansion, Expression for Joule Thomson cooling **8. Production of low temperature**: Adiabatic demagnetization, Principle of Refrigeration, effects of chloro and fluoro carbons on ozone layer.	12
V	**9. Radiation Laws**: (7 hrs) Blackbody and its spectral energy distribution of black body radiation, Kirchoff's law, Wein's displacement law, Stefan-Boltzmann's law and Rayleigh-Jean's law (No derivations), Planck's law of black body radiation-Derivation, Deduction of Wein's law and Rayleigh- Jean's law from Planck's law. **10. Measurement of Radiation (5 hrs)** Pyrometers: Angstrom pyrheliometer and determination Solar constant, Estimation of surface temperature of Sun.	12

List of experiments

1. Study of variation of resistance with temperature - Thermistor.

2. Thermal conductivity of bad conductor-Lee's method

3. Thermal conductivity of rubber.

4. Measurement of Stefan's constant - emissive method

5. Heating efficiency of electrical kettle with varying voltages.

6. Specific heat of a liquid –Joule's calorimeter –Barton's radiation correction

7. Specific heat of a liquid by applying Newton's law of cooling correction.

8. Thermo emf- thermo couple - Potentiometer

9. Thermal behavior of an electric bulb (filament/torch light bulb)

10. Measurement of Stefan's constant

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DEPARTMENT OF PHYSICS
2022-23
Title of the Paper: ELECTRICAL APPLIANCES

(AS PART OF SKILL DEVELOPMENT COURSES)

Semester: I

UNIT-I (6 hrs)

Voltage, Current, Resistance, Capacitance, Inductance, Electrical conductors and Insulators, Ohm's law, Series and parallel combinations of resistors, Galvanometer, Ammeter, Voltmeter, Multimeter, Transformers, Electrical energy, Power, Kilowatt hour (kWh), consumption of electrical power .

UNIT-II (10 hrs)

Direct current and alternating current, RMS and peak values, Power factor, Single phase and three phase connections , Basics of House wiring, Star and delta connection, Electric shock, First aid for electric shock, Overloading , Earthling and its necessity, Short circuiting , Fuses , MCB , ELCB, Insulation, Inverter, UPS .

UNIT-III   (10 hrs)

Principles of working, parts and servicing of Electric fan, Electric Iron box, Water heater; Induction heater, Microwave oven; Refrigerator, Concept of illumination, Electric bulbs, CFL, LED lights, Energy efficiency in electrical appliances, IS codes & IE codes.

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DEPARTMENT OF PHYSICS
2022-23
Domain Subject: PHYSICS

Title of the Paper : APPLICATIONS OF ELECTRICITY & ELECTRONICS

Semester : V

 [Skill Enhancement Course (Elective)]

Offered to : III B.Sc (MPC & MPCs)   **Course Type:** Core (TH)

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**UNIT-I: INTRODUCTION TO PASSIVE ELEMENTS** **a) Passive elements** Resistor - Types of Resistors, Color coding, Combination of Resistors – Series combination (Voltage division), Parallel combination (Current division), Ohms Law and its limitation. Inductor - Principle, Types of Inductors. Capacitor - Principle, Charging and discharging of a Capacitor, Types of Capacitors. **b) Applications of Passive elements:**	9

		Applications of a Resistor as a heating element in heaters and as a fuse element. Applications of Inductors, Application of choke in a fan and in a radio tuning circuit, Series resonance circuit as a Radio tuning circuit. Applications of Capacitor in power supplies, motors (Fans).	

II		**UNIT-II: POWER SOURCES (BATTERIES)**
		
		a) **Power sources:**
		   Types of power sources- DC & AC sources, Different types of batteries, Rechargeable batteries - Lead acid batteries, Li-ion batteries, **Series, Parallel & Series-Parallel configuration of batteries**
		
		b) **Network Theorems for DC circuits**
		   Thevenin's theorem, Norton's theorem, Maximum Power transfer theorem, Constant Voltage source - Constant Current Source-Applications of Current sources & Voltage sources.
			9

III		**UNIT-III: ALTERNATING & DIRECT CURRENTS** a) A.C Generator, Construction and its working principle, DC Generator, Construction and its working principle, advantages and disadvantages, Differences between DC and AC generators b) Transformers- Construction and its working principle, Open circuit and short circuit tests, Types of Transformers - Step-down and Step-up Transformers, Relation between primary and secondary turns of the transformer with emf, Use of Transformer in a regulated Power supply	9

IV		**UNIT-IV: MODULATION CIRCUITS** (Skill Based)
		a) **Amplitude modulation:**
		   Amplitude modulation, modulation index, Waveforms, Power relations, AM transmitter, AM Receiver, Demodulation, Diode detector
		b) **Frequency modulation:**
		
		   Frequency modulation, modulation index, Waveforms, FM Transmitter, FM Receiver
			9

V		**Unit-V: Applications of EM Induction & Power Supplies (Skill Based)** a) DC motor – Construction and operating principle, Calculation of power, voltage and current in a DC motor, Design of a simple Motor (Fan) with suitable turns of coil b) Working of a DC regulated power supply, Construction of 5 volts regulated power supply, Design of a step-down (ex:220-12V) and step-up (ex:120-240V) transformers-Simple Design of FM Radio circuit using LCR series resonance (tuning) circuit, Design of a simple 5 volts DC charger	9

Course : Applications of Electricity & Electronics

PRACTICAL (Laboratory) SYLLABUS *(Max Marks:50)*

<u>EXPERIMENTS LIST</u>

Minimum <u>SIX</u> experiments are to be done and recorded

1. Measurement of R using Color coding of Resistors and measurement of R using multimeter   **- Resistors of different values, Multimeters**
2. Connect two or three resistors or capacitors or inductors and measure the Series, Parallel Combination values using a Multimeter and compare the values with the calculated values   - **Capacitors of different values**
3. Use the Digital Multimeter and Analog Multimeter to measure the output voltage of an AC & DC power supply - **Digital Multimeters, Analog Multimeters**
4. Use the Multimeter to check the functionality of a Diode and Transistor. Also test whether the given transistor is PNP or NPN - **Different types of Transistors and Diodes**
5. Construct a series electric circuit with R, L and C having an AC source and study the frequency response of this circuit. Find the Resonance Frequency. **– Series Resonance Experiment (Function generators)**
6. Construct a Parallel electric circuit with R, L & C having an AC source and study the frequency response of this circuit .Find the resonant frequency. **– Parallel Resonance Experiment (Function generators)**
7. Test whether a circuit is a Open circuit or Short Circuit by measuring continuity with Multimeter and record your readings. **– Experimental Kit to do the tests**
8. AM Generation Kit
9. FM generation Kit

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DEPARTMENT OF PHYSICS
2022-23
Domain Subject: PHYSICS

Title of the Paper : ELECTRONIC INSTRUMENTATION   Semester: V

[Skill Enhancement Course (Elective)] **Offered to : III** B.Sc (MPC & MPCs)**Course Type:** Core (TH)

<u>SYLLABUS</u>

Unit	Learning Units	Lecture Hours

I	**UNIT-I INTRODUCTION TO INSTRUMENTS** **a)** Basic of measurements: Instruments accuracy, precision, sensitivity, resolution, range, errors in measurement, Classification of Instruments, Analog instruments & Digital Instruments, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), DC Voltmeter and AC Voltmeter, Sensitivity, Sources of errors in the Measurement of resistance, voltage and current **b)** Specifications of multimeter and their significance, Basic ideas on Function generator (brief explanation)Balancing and damping Moving iron instruments &PMMC instruments - extension of range.	9
II	**UNIT-II OSCILLOSCOPE** **a)** Cathode ray oscilloscope – Principle and block diagram of CRO - Cathode Ray Tube – functioning – various controls **b)** Applications CRO: Measurement of voltage (dc and ac), frequency& time period, Different types of oscilloscopes and their uses, Digital storage Oscilloscope	9
III	**UNIT-III TRANSDUCERS AND BRIDGES** **a)** Classification of Transducers, Resistive, Capacitive & Inductive transducers, Piezoelectric transducer, Photo transducer, Digital transducer. b)DC bridge – Wheatstone's bridge, AC Bridges - Measurement of Inductance and Capacitance – Maxwell's bridge, Hays bridge	9
IV	**UNIT-IV ADC AND DAC &DISPLAY INSTRUMENTS** a)A/D & D/A converters - Binary ladder, A/D converters – continuous type, integrating type, successive approximation type. b)Introduction to Display devices, LED Displays, Seven Segment Displays, Construction and operation (Display of numbers).	9
V	**UNIT-V AMPLIFIERS, OSCILLATORS & BIOMEDICAL INSTRUMENTS** (9hrs) **a)** Amplifiers – Classification of amplifiers, Coupling amplifiers – RC Coupled amplifier – frequency response characteristics (no derivation), Feedback in Electronic circuits – Positive and Negative feedback, Barkhausen criteria, RC phase shift oscillator **b)** Basic operating principles and uses of (i) Clinical thermometer (ii) Stethoscope (iii) ECG machine (iv) Radiography (v) Ultrasound scanning	9

Course : Electronic Instrumentation– PRACTICAL SYLLABUS

Practical (Laboratory) Syllabus:*(Max Marks:50)*

Minimum <u>SIX</u> experiments are to be done and recorded

1. Familiarization of digital multimeter and its usage in the measurements of (i) resistance (ii) current, (iii) AC & DC voltages
2. Measure the AC and DC voltages, frequency using a CRO and compare the values measured with other instruments like Digital multimeter.
3. Formation of Sine, Square wave signals on the CRO using Function Generator and measure their frequencies. Compare the measured values with actual values.
4. Display the numbers from 0 to 9 on a single Seven Segment Display module by applying voltages.
5. Displacement transducer - LVDT
6. A.C - Impedance and Power Factor.
7. Maxwell's Bridge – Determination of Inductance.
8. Measurement of body temperature using a digital thermometer and list out the error and corrections.
9. Measurement of Blood Pressure of a person using a B.P. meter and record your values and analyze them.
10. Display the letters **a** to **h** on a single Seven Segment Display module by applying   voltages.
11. Get acquainted with an available ECG machine and study the ECG pattern to understand the meaning of various peaks
12. Observe and understand the operation of a Digital Pulseoxymeter and measure the pulse rate of different people and understand the working of the meter.

TITLE OF THE PAPER :   Wave Optics   Semester : II

Syllabus

WAVE OPTICS

Course Details

Unit	Learning Units	Lecture Hours
I	**Interference of light: (Problem)** **A) Division of Wavefront:** Introduction, Conditions for the interference of light, Interference of light by division of wavefront and amplitude, Phase change on reflection- Stokes' treatment, Fresnel's Bi-Prism-Determination of Wavelength of Light. **B) Division of Amplitude**: Cosine law - colours in thin films, Newton's rings in reflected light-Theory and experiment - Determination of wavelength of monochromatic light, Michelson interferometer and determination of wavelength.	12
II	**Diffraction of light(Problem)** **A) Fraunhofer Class**: Distinction between Fresnel and Fraunhofer diffraction,Fraunhofer diffraction at a single slit, Double slit and N-slits (No Derivation for N-Slits), Determination of wavelength of light using a diffraction grating, Resolving power of grating, **B) Fresnel's Class:** Fresnel's half-period zones, Zone plate, comparison of zone plate with a convexlens	12
III	**Polarisation of light(Problem)** **A) Polarized light:** Methods of production of plane-polarized light - Polarisation by reflection (Brewster's law), Malus law,Double refraction, Nicol prism, Nicol prism as polarizer and analyzer, Quarter wave plate, Half wave plate **B) Types and production of polarized Light:** Plane, Circularly and Elliptically polarized light-Production and detection, Optical activity, Laurent's half shade polarimeter: determination of the specific rotation	12
IV	**A) Aberrations**: **(Problem)** Monochromatic aberrations - Spherical aberration, Methods of minimizing spherical aberration, Coma& Astigmatism -minimization methods, Chromatic aberration-the achromatic doublet; Achromatism for two lenses (i) in contact and (ii) separated by a distance. **B) FibreOptics:(No Problem)** Fibre optics: Introduction to Fibers, different types of fibers, rays and modes in an optical fiber, Principles of fiber communication (qualitative treatment only), Advantages of fiber optic communication.	12

V	**Lasers and Holography (No Problem)** **A) Lasers**: Introduction, Spontaneous emission, stimulated emission, Population Inversion, Laser principle, Einstein coefficients, Types of lasers-He-Ne laser, Ruby laser, Applications of lasers **B) Holography**: Basic principle of holography, Applications of holography	12

Minimum of 6 experiments to be done and recorded

1. Determination of radius of curvature of a given convex lens- Newton'srings.
2. Resolving power of grating.
3. Study of optical rotation– polarimeter.
4. Dispersive power of a prism.
5. Determination of wavelength of light using diffraction grating- minimum deviation method.
6. Determination of wavelength of light using diffraction grating- normal incidence method.
7. Resolving power of a telescope.
8. Refractive index of a liquid-hallowprism
9. Determination of thickness of a thin wire by wedge method
10. Determination of refractive index of liquid-Boy's method.

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TITLE OF THE PAPER **: ELECTRICITY, MAGNETISM AND ELECTRONICS**

Course Details

Unit	Learning Units	Lecture Hours
I	**A) Electrostatics: (6hrs)** Gauss's law-Statement and its proof, Electric field intensity due to (i) uniformly charged solid sphere and (ii) an infinite conducting sheet of charge, Deduction of Coulomb's law from Gauss law, Electrical potential–Equipotential surfaces, Potential due to a (i)point charge (ii)uniformly charged sphere **B) Dielectrics: (6 hrs)** Polar and Non-polar dielectrics- Electric displacement D, electric polarization P,Relation between D, E and P, Dielectric constant and electric susceptibility.	12
II	**A) Magnetostatics: (6 hrs)** Biot-Savart's law and its applications: (i) calculation of B due to long straight wire and (ii) solenoid, Ampere's Circuital Law and its application to Solenoid,Hall effect, determination of Hall coefficient and applications. **B) Electromagnetic Induction: (6 hrs)** Faraday's laws of electromagnetic induction, Lenz's law, Self-induction and Mutual induction, Self-inductance of a long solenoid, Mutual inductance of two coils, Energy stored in a magnetic field, Eddy currents and Electromagnetic damping	12
III	**A) Alternating currents: (6 hrs)** Alternating current - Relation between current and voltage in LR and CR circuits,Phasor and Vector diagrams, LCR series and parallel resonant circuit, Q –factor, Power in ac circuits, Power factor. **B) Electromagnetic waves-Maxwell's equations: (6 hrs)** Idea of displacement current,Maxwell's Equations-Derivation, Maxwell's wave equation (with derivation), Transverse nature of electromagnetic waves, Poynting theorem (Statement and proof)	12
IV	**Basic Electronic devices:** **A) Diodes**: PN junction diode, Zener diode andLight Emitting Diode (LED) and their I-V characteristics, Zener diode as a regulator **B) Transistors**: Transistors and its operation, CB, CE and CC configurations, Input and output characteristicsofa transistor in CE mode, Relation between alpha, beta and gamma; Hybrid parameters, Determination of hybrid parameters from transistor characteristics; Transistor as an amplifier	12

V	**Digital Electronics:** Number systems, Conversion of binary to decimal system and vice versa, Binary addition & Binary subtraction (1's and 2's complement methods), Laws of Boolean algebra, Basic logic gates, DeMorgan's laws-Statements and Proofs, NAND and NOR as universal gates, Exclusive-OR gate, Half adder and Full adder circuits.	12

Minimum of 6 experiments to be done and recorded

1. LCR circuit series -resonance, Q factor.

2. LCR parallel circuit - resonance, Q factor.

3. Determination of ac-frequency –Sonometer.

4. Verification of Kirchoff's laws

5. Field along the axis of a circular coil carrying current-Stewart & Gee's apparatus.

6. PN Junction Diode V-I Characteristics

7. Zener Diode –V-I Characteristics

8. Logic Gates- OR, AND, NOT and NAND gates. Verification of Truth Tables.

9. Verification of De Morgan's Theorems.

10. Construction of Half adder and Full adder-Verification of truth tables

11. Zener Diode as a voltage regulator

12. Transistor CE Characteristics- Determination of hybrid parameters

13. Figure of merit of a moving coil galvanometer.

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DEPARTMENT OF PHYSICS
2022-23
TITLE OF THE PAPER : MODERN PHYSICS
Semester: IV
Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	1. **Atomic Physics**: (07 hrs) Vector atom model and Stern-Gerlach experiment, Quantum numbers associated with it, Angular momentum of the atom, Coupling schemes, Selection rules, Intensity rules, Spectral terms and spectral notations. 2. **Molecular Physics** (05 hrs) Raman effect, Characteristics of Raman effect, Experimental study of Raman effect, Quantum theory of Raman effect, Applications of Raman effect.	12
II	3. **Matter waves & de-Broglie's hypothesis** (06 hrs) Failures of Classical Mechanics, Matter waves – de-Broglie's hypothesis, Derivation for de-Broglie wave length of matter waves, Properties of matter waves, Davisson and Germer's experiment, Phase and group velocities (**Qualitative**), 4. **Uncertainty Principle and Quantization** (06 hrs) Heisenberg's uncertainty principle for position and momentum (x and p), & energy and time (E and t), Illustration of uncertainty principle using diffraction of beam of electrons (Diffraction by a single slit) and photons (Gamma ray microscope), Bohr's principle of complementarily.	12
III	5. **Quantum (Wave) Mechanics**:(12 hrs) Basic postulates of quantum mechanics, Schrodinger time independent and time dependent wave equations - Derivations, Physical interpretation of wave function, Eigen functions, Eigen values, Application of Schrodinger wave equation to one dimensional potential box of infinite height (Infinite Potential Well)	12
IV	. 6. **Structure of Nuclei and Nuclear Models**: (06 hrs) Nuclear Structure: General Properties of Nuclei, Mass defect, Binding energy; Nuclear forces, Characteristics of nuclear forces, Nuclear Models:	12

	Liquid drop model, Shell model, Magic numbers. 7. **Elementary Particle Physics** (06 hrs) Elementary Particles and their classification, Fundamental Interactions – gravitational, electromagnetic, strong & week; Properties of Leptons, Mesons and Baryons	
V	8. **Crystal Structure** Amorphous and crystalline materials, unit cell, Miller indices, reciprocal lattice, types of lattices, diffraction of X-rays by crystals, Bragg's law, Laue's method and powder diffraction method 9. **Superconductivity**: (05 hrs) Introduction – Properties of superconductors- critical temperature (T_c), critical magnetic field (T_m), Meissner effect, Type I and Type II superconductors, BCS theory (Qualitative),Applications of superconductors.	12

List of experiments

1. Determination of M & H.
2. Energy gap of a semiconductor using junction diode.
3. Energy gap of a semiconductor using thermistor
4. Verification of inverse square law of light using photovoltaic cell.
5. Determination of the Planck's constant using LEDs of at least 3 different colours.
6. e/m of an electron by Thomson method.
7. Determination of Planck's Constant (photocell).
8. Analysis of powder X-ray diffraction pattern to determine properties of crystals.
9. GM counter characteristics
10. Determination of work function of material of filament of directly heated vacuum diode.
11. Study of absorption of α-rays.
12. Study of absorption of β-rays.
13. Determination of Range of β-particles.

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DEPARTMENT OF PHYSICS
2022-23
Domain Subject: PHYSICS
Title of the Paper : APPLICATIONS OF ELECTRICITY & ELECTRONICS

Semester : VI

 [Skill Enhancement Course (Elective)]

Offered to : III B.Sc (MPC & MPCs)   **Course Type:** Core (TH)

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**UNIT-I: INTRODUCTION TO PASSIVE ELEMENTS** **c) Passive elements** Resistor - Types of Resistors, Color coding, Combination of Resistors – Series combination (Voltage division), Parallel combination (Current division), Ohms Law and its limitation. Inductor - Principle, Types of Inductors. Capacitor - Principle, Charging and discharging of a Capacitor, Types of Capacitors. **d) Applications of Passive elements:** Applications of a Resistor as a heating element in heaters and as a fuse element. Applications of Inductors, Application of choke in a fan and in a radio tuning circuit, Series resonance circuit as a Radio tuning circuit. Applications of Capacitor in power supplies, motors (Fans).	9

II	**UNIT-II: POWER SOURCES (BATTERIES)** a) **Power sources:** Types of power sources-DC & AC sources, Different types of batteries, Rechargeable batteries - Lead acid batteries, Li-ion batteries, **Series, Parallel & Series-Parallel configuration of batteries** b) **Network Theorems for DC circuits** Thevenin's theorem, Norton's theorem, Maximum Power transfer theorem, Constant Voltage source - Constant Current Source-Applications of Current sources & Voltage sources.		9
III	**UNIT-III: ALTERNATING & DIRECT CURRENTS** c) A.C Generator, Construction and its working principle, DC Generator, Construction and its working principle, advantages and disadvantages, Differences between DC and AC generators d) Transformers- Construction and its working principle, Open circuit and short circuit tests, Types of Transformers - Step-down and Step-up Transformers, Relation between primary and secondary turns of the transformer with emf, Use of Transformer in a regulated Power supply		9
IV	**UNIT-IV: MODULATION CIRCUITS** (Skill Based) a) **Amplitude modulation:** Amplitude modulation, modulation index, Waveforms, Power relations, AM transmitter, AM Receiver, Demodulation, Diode detector b) **Frequency modulation:** Frequency modulation, modulation index, Waveforms, FM Transmitter, FM Receiver		9
V	**Unit-V: Applications of EM Induction & Power Supplies (Skill Based)** a) DC motor – Construction and operating principle, Calculation of power, voltage and current in a DC motor, Design of a simple Motor (Fan) with suitable turns of coil b) Working of a DC regulated power supply, Construction of 5 volts regulated power supply, Design of a step-down (ex:220-12V) and step-up (ex:120-240V) transformers-Simple Design of FM Radio circuit using LCR series resonance (tuning) circuit, Design of a simple 5 volts DC charger		9

Course : Applications of Electricity & Electronics

PRACTICAL (Laboratory) SYLLABUS *(Max Marks:50)*

EXPERIMENTS LIST

Minimum SIX experiments are to be done and recorded

1. Measurement of R using Color coding of Resistors and measurement of R using multimeter   **- Resistors of different values, Multimeters**

2. Connect two or three resistors or capacitors or inductors and measure the Series, Parallel Combination values using a Multimeter and compare the values with the calculated values
        - **Capacitors of different values**

3. Use the Digital Multimeter and Analog Multimeter to measure the output voltage of an AC & DC power supply - **Digital Multimeters, Analog Multimeters**

4. Use the Multimeter to check the functionality of a Diode and Transistor. Also test whether the given transistor is PNP or NPN - **Different types of Transistors and Diodes**

5. Construct a series electric circuit with R, L and C having an AC source and study the frequency response of this circuit. Find the Resonance Frequency. **– Series Resonance Experiment (Function generators)**

6. Construct a Parallel electric circuit with R, L & C having an AC source and study the frequency response of this circuit .Find the resonant frequency. **– Parallel Resonance Experiment (Function generators)**

7. Test whether a circuit is a Open circuit or Short Circuit by measuring continuity with Multimeter and record your readings. **– Experimental Kit to do the tests**

8. AM Generation Kit

9. FM generation Kit

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2022-23
Domain Subject: PHYSICS

Title of the Paper :   ELECTRONIC INSTRUMENTATION   Semester: VI

[Skill Enhancement Course (Elective)] **Offered to : III** B.Sc (MPC & MPCs)**Course Type:** Core (TH)

<u>**SYLLABUS**</u>

Unit	Learning Units	Lecture Hours

I	**UNIT-I INTRODUCTION TO INSTRUMENTS** a) Basic of measurements: Instruments accuracy, precision, sensitivity, resolution, range, errors in measurement, Classification of Instruments, Analog instruments & Digital Instruments, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), DC Voltmeter and AC Voltmeter, Sensitivity, Sources of errors in the Measurement of resistance, voltage and current B) Specifications of multimeter and their significance, Basic ideas on Function generator (brief explanation)Balancing and damping Moving iron instruments &PMMC instruments - extension of range.	9
II	**UNIT-II OSCILLOSCOPE** a) Cathode ray oscilloscope – Principle and block diagram of CRO - Cathode Ray Tube – functioning – various controls b) Applications CRO: Measurement of voltage (dc and ac), frequency& time period, Different types of oscilloscopes and their uses, Digital storage Oscilloscope	9
III	**UNIT-III TRANSDUCERS AND BRIDGES** **a)** Classification of Transducers, Resistive, Capacitive & Inductive transducers, Piezoelectric transducer, Photo transducer, Digital transducer. b)DC bridge – Wheatstone's bridge, AC Bridges - Measurement of Inductance and Capacitance – Maxwell's bridge, Hays bridge	9
IV	**UNIT-IV ADC AND DAC &DISPLAY INSTRUMENTS** **a)**A/D & D/A converters - Binary ladder, A/D converters – continuous type, integrating type, successive approximation type. b)Introduction to Display devices, LED Displays, Seven Segment Displays, Construction and operation (Display of numbers).	9
V	**UNIT-V AMPLIFIERS, OSCILLATORS & BIOMEDICAL INSTRUMENTS** (9hrs) a) Amplifiers – Classification of amplifiers, Coupling amplifiers – RC Coupled amplifier – frequency response characteristics (no derivation), Feedback in Electronic circuits – Positive and Negative feedback, Barkhausen criteria, RC phase shift oscillator b) Basic operating principles and uses of (i) Clinical thermometer (ii) Stethoscope (iii) ECG machine (iv) Radiography (v) Ultrasound scanning	9

Course : Electronic Instrumentation– PRACTICAL SYLLABUS

Practical (Laboratory) Syllabus:*(Max Marks:50)*

Minimum SIX experiments are to be done and recorded

1. Familiarization of digital multimeter and its usage in the measurements of (i) resistance (ii) current, (iii) AC & DC voltages
2. Measure the AC and DC voltages, frequency using a CRO and compare the values measured with other instruments like Digital multimeter.
3. Formation of Sine, Square wave signals on the CRO using Function Generator and measure their frequencies. Compare the measured values with actual values.
4. Display the numbers from 0 to 9 on a single Seven Segment Display module by applying voltages.
5. Displacement transducer - LVDT
6. A.C - Impedance and Power Factor.
7. Maxwell's Bridge – Determination of Inductance.
8. Measurement of body temperature using a digital thermometer and list out the error and corrections.
9. Measurement of Blood Pressure of a person using a B.P. meter and record your values and analyze them.
10. Display the letters **a** to **h** on a single Seven Segment Display module by applying voltages.
11. Get acquainted with an available ECG machine and study the ECG pattern to understand the meaning of various peaks
12. Observe and understand the operation of a Digital Pulseoxymeter and measure the pulse rate of different people and understand the working of the meter.

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NAAC reaccredited at 'A' level
Autonomous -ISO 9001 – 2015 Certified
DEPARTMENT OF PHYSICS
2022-23
Title of the Paper: SOLAR ENERGY

(AS PART OF SKILL DEVELOPMENT COURSES)

Semester: III

Total 30 hrs (02h/wk),   02 Credits, MaxMarks: 50

Learning Outcomes:

After successful completion of the course, students will be able to:

1. Acquire knowledge onsolarradiation principles with respect to solar energy estimation.
2. Get familiarized with various collecting techniques of solar energy and its storage
3. Learn the solar photovoltaic technology principles and different types of solar cells for energy conversion and different photovoltaic applications.
4. Understand the working principles of several solar appliances like Solar cookers, Solar hot water systems, Solar dryers, Solar Distillation, Solar greenhouses

SYLLABUS

UNIT-I –

Solar Radiation: (6 hrs)

Sun as a source of energy, Solar radiation, Solar radiation at the Earth's surface, Measurement of Solar radiation-Pyro heliometer, Pyranometer, Sun shinerecorder, Prediction of available solar radiation, Solar energy-Importance, Storage of solarenergy, Solar pond.

UNIT-II

Solar Thermal Systems: (10 hrs)

Principle of conversion of solar radiation into heat,Collectors used for solar thermal conversion: Flat plate collectors and Concentrating collectors,Solar Thermal Power Plant, Solar cookers, Solar hot water systems, Solar dryers, Solar Distillation, Solar greenhouses.

UNIT-III
Solar Photovoltaic Systems: (10 hrs)

Conversion of Solar energy into Electricity -Photovoltaic Effect, Solar photovoltaic cell and its working principle, Different types of Solarcells, Series and parallel connections, Photovoltaic applications: Battery chargers, domestic lighting, street lighting and water pumping

Adusumilli Gopala krishnaiah & Sugar Cane Growers Siddhartha Degree
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DEPARTMENT OF POLITICAL SCIENCE

HIGHLIGHTED SYLLABUS OF DEPARTMENT OF POLITICAL SCIENCE

2022-2023

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability

Skill-Development

Entrepreneurship

I B.A 2nd Semester
(2022-2023)

Paper II: Basic Organs of the Government   Paper code:POLT21B

Work load: 90 hrs per semester   credits - 4   5 hrs/week

UNIT- I .. (15 hrs)
1.Constitution
1)meaning,Definition,Origin and Evolution of Constitution
2)Classion of the Constitution-Written and Unwritten,Rigid and Flexible

UNIT- II ..(20 hrs)
 2.Organs of the Government
1)Theory of Seperation of Powers-B.D Montesquieu.
2)Legislature-Unicameral and Bicameral-Powers and Functions,Executive-Types,Powers and Functions.
3)Judiciary-Powers and Functions.

UNIT- III ..(20 hrs)
3.Forms of Government
1)Unitary and Federal Forms of Government-Merits and Demerits
2)Parliamentary and Presidential Forms of Government-Merits and Demerits

UNIT- IV ..(15 hrs)
4.Democracy
1)Meaning,Definition,Significance,Theories and Principles of Democracy
2)**Types of Democracy:Direct and Indirect Democracy**-Methods,Merits and-Essential Conditions for Success of Democracy

UNIT- V ..(20 hrs)
5.Political Parties-Pressure Groups-Public Opinion
1)Meaning,Definition and Classification of Political Parties:National and Reigional-Functions of Political Parties
2)Pressure Groups (Interest Groups)-Meaning,Definition,Types,Functions and Significance of Public Opinion

II B.A – III Semester
(2022-2023)

Course Code:POL301   **SEMESTER:III**

Work load:90 hours per Semester   credits - 4
5hours/week work

Paper Name:Indian government and Politics

UNIT- I (20 hours)
Social and Ideological Base of the Indian Constitution
1)Constituional Development in India During British Rule-A Historical Perspective with the Reference to Government of India Acts,1909,1919 and 1935.
2)Constituent Assembly Nature,Composition,Socio-Economic,Philosophical Dimensions and Salient Features of The Indian Constitution

UNIT- II (20hours)
Individual and State
1)Fundamental Rights, Directive Principles of State Policy and Fundamental Duties-Differences Between Fundamental Rights and Directive Principles of State
2)The Doctrine of Basic Structure of The ConstitutionWith Referance To Judicial Interpretation And Socio-Political Realities

UNIT- III (15hours)
Union Executive
1)President of India Mode of Elections,Powers and Functions
2)Parliament –Composition,Powers and Functions,Legislative Committees,Prime Minster and and Council of Ministers-Powers and functions,role in CoalitionPolitics
UNIT- IV (15hours)
State Executive
1)Governer-Mode of Appointement,Powers nad Functions
2)Legislature-Composition,Powers and Functions,Chief Minstser and Council of Minister-Powers and Functions
UNIT- V (20hours)
The Indian Judiciary
1)Supreme court-Composition and Appointements,Powers and Functions or Jurisdiction of the Supreme Court,Judicial Review,Judicial Activism.

II B.A – IV Semester

(2022 – 2023)

SEMISTER-IV   **Course Code: POL401**   **credits – 4**

Work Load:90 hours per semester   Paper Title:Indian Political Process

UNIT- I (15hours)
Federal Process
1)Central State Relations-Legislative,Administrative and Finanacial
2)Eemerging Trends in Centrla State Relations-Restructing Centre State Relations-Recommenadations of Sarkaria Commission,M.M punchi Commission
UNIT-II: **(15hours)**
Electoral Process
1)The Election Commission of India Powers and Functions
2)Issue of Electoral Reforms,Voting Behaviour-Determinants and Problems of Defections
UNIT-III (20hours)
Grossroot Democracy-Decentralisation
1)Panchayati Raj System-Local and Urban Governments Structure, Powers and Functions
2)Democratic Decentralization-Rural Development and Poverty Alieviation with Referance to 73rd and 74th Constututional Amendment Acts Challenges and Prospects
UNIT-IV: **(20hours)**
Social Dynamics-Emerging Challenges To Indian Political System
1)Role of Caste,Religion,Language and Regionlism in India
2)Politics of Reservation,Criminalization of Politics and Internal Threats to Security
UNIT-V: **(20hours)**
Regularity and Governance-Instituions
1)NITI Ayog,Finance Commission,Comptroller and Auditior General of India
2)Central Vigilance Commission,Central information Commision,Lokpal and Lokayukta

COURSE CODE : POL-402　　　**II B.A 4th Semester**
(2022-2023)

Paper Title:Western Political Thought

Total Work Load:90 hours per Semester

5 hrs/week　　　　　　　**SEMISTER-IV**　　　　　**credits – 4**

UNIT – I (20 hours)
Ancient Greek Political Thought
1)Plato-Rule of Philosopher Kings-Theory of Justice-Ideal State and Education
2)Aristotle-Theory of State-Classification of Governament-Citizenship,Slavery and Theory of Revolutions
UNIT –II (15 hours)
Medieval and Modren Political Thought
1)St.Augustine-Theory of Two Cities
2)Niccolo Machiavelli-State and Statecraft
UNIT – III (20 hrs)
Contractual Political Thought
1)Thomas Hobbes-Social Contract and Absolute Sovereignity
2)John Locke-Human Nature,State of Nature,Social Contract,Natural Rights and Limited Government
3)Jean Jacques Rousseau-Human Nature,State of Nature,SocialContract,General Will and Popular
UNIT – IV (20 hrs)
Utilitarian Political Thought
1)Jermy Bentham-Theory of Utility,Law and Reforms
2)J.S.Mill-Theory of Liberty and Representative Governament
UNIT – V (15 hrs)
Marxist Political Thought
1)Karl Marx-Dialectical Materialism,Theory of Surplus Value and Class Struggle
2)Antonio Gramsci-Hegemony and Civil Society.

III B.A. 5/6 Semester
(2022-2023)
Paper V/VI:E-Governance

Work load : 90 hrs per semester   **5 hrs/week**
Course Code : SEC601   **Credits-4**

Unit – I (15hrs)
Introduction to E-Governance
Meaning,Definition,Nature,Scope Objectives And Significance-Domains of E-Governance.
E-Governanmce and Good Governance-Global Trends in The Growth of E-Governance

Unit – II (20hrs)
E-Governance in India
National E-Governance Plan National Informatics Center Strategies For E-Governance
Implementations Required Infrastructure of Network,Computing,Cloud Governance,Data
System,Human Resource Legal and Technical Infrastructure

Unit-III(20hours)
Role of Information and Communication Technology in Administration
Online Filling,Complaints,Application Regstrations,Issuance of Certificates,Issuance of Land
Records,Online Payments of Fees,Dues etc.

Unit-IV (20hours)
E-Governance-Information Technology Act
Legal Status,Digital Transactions,Public and Private Partnership,Digital Divide,Cyber
Security,Cyber Crime,Networking with NGO's

Unit-V(15hrs)
Major E-Governance Projects
E-Bhoomi,E-Seva,CARD,E-Panchayat,Real Time Governance (RTG) etc.

DEPARTMENT OF POLITICAL SCIENCE
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III B.A. 5/6 Semester
(2022-2023)
Paper V/VI:Local Administration

Work load : 90 hrs per semester   **5 hrs/week**
Course Code : SEC602   **Credits-4**

Unit – I (15hrs)
Introduction to Local Administration
Meaning,Nature anad Importance Thought on L;ocal Governments by M.k.Gandhi,Jawahar lal Nehru and B.R.Ambedkar.Importance committees-Balwanthrai Mehta(1957)Ashok Mehta(1978)L.M.Singhvi(1986).

Unit – II (20hrs)
Decentralisation of Powers
Decentralisation of Powers Political,Administrative,nad Economic From The States to Local Institutions-73rd and 74th Constitutional Amendements Acts-Empowering Local Governments-Decision Making Governments During Crisis and Disasters Relationship Between Local Governments Authorities Central and State.

Unit-III(20hours)
Revenue Rising Avenues for Local Governments Grants
Aid and Support From Central State Government-Publc Private Partnership Concept of Local Development Villages as a unit SWOC analysis of Village.

Unit-IV (20hours)
Challenges for Local Administration
Public Relations in Local Administration-Need for Training for Elected Representatives,Stakeholders-Audit Training and Participatory Training

Unit-V(15hrs)
Reports
Different Types of Reports,Welfare Development Programmes i.e (MGNREGS), (SGSY), (IAY) and (PURA).

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DEPARTMENT OF STATISTICS

HIGHLIGHTED SYLLABUS OF B.Sc. MSCs

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Colour, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability ⬜

Skill-Development ⬜

Entrepreneurship ⬜

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Semester : I

Paper title : Descriptive Statistics and Theory of Probability

Course code : STAT11B

Unit- I

Moments: Central and non-central moments and their inter-relationships, Sheppard's corrections for moments for grouped data. Skewness: Definition, measures of skewness by Karl Pearson' s, Bowley's formulae and based on moments. Kurtosis: Definition, measures of kurtosis based on moments, Simple problems.

Unit- II

Probability-I: Definitions of various terms - Random experiments, trial, sample space, mutually exclusive, exhaustive , equally likely, favourable and independent events. Definitions- Mathematical, Statistical and Axiomatic definitions of probabilities. Law of addition of probabilities for two events and extension of general law of addition of probabilities. Boole's inequality for n events and real-life problems.

Unit -III

Probability-II : Conditional Probability-Definition - dependent and independence events, multiplication law of probability for two events, extension of multiplication law ofprobability. Pairwise independent events and conditions for mutual independence of n eventsand Baye's theorem and its applications and problems.

Unit- IV

Random Variables: Univariate Random variables- Definition, Discrete and Continuous random variables - Probability mass function and probability density function with illustrations. Distribution function and its properties. Bivariate random variables- Definition, Discrete and Continuous bi-variate random variables- joint, marginal and conditional distributions- its properties. Distribution functions of the bivariate random variables and its properties. Independence of random variables, and simple problems.

UnitV- V

Mathematical Expectations: Definition, Mathematical expectation of function of a random variable, Properties of Expectations - Addition and Multiplication theorems of expectation. Properties of Variance and Covariance. Cauchy-Schwartz Inequality. Generating Functions- Definition of moment generating function (m.g.f , Cumulant generating function (c.g.f), Probability generating function (p.g.f) and Characteristic function (c.f) and statements of their properties with applications. Chebyshev's inequality and its applications. Statement of Weak Law of Large Numbers for identically and independently distributed (i.i.d) random variables with finite variance.

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Vuyyuru-521165, Krishna District, Andhra Pradesh

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Semester : II
Paper title : Probability Distributions and Statistical Methods
Course code : STAT21C

Unit- I
Theoretical Probability Discrete Distributions:
Rectangular, Binomial, Poisson, Negative Binomial, Geometric, Hyper Geometric distributions: Definitions, Means, Variances, M.G.F, C.G.F, P.G.F, additive property, limiting cases, memory less property if exists. Simple problems.

Unit- II
Theoretical Probability Continuous Distributions:
Rectangular, Normal, Exponential, Gamma, Beta Distributions: Definitions, Means, Variances, M.G.F, C.G.F, P.G.F, additive property, limiting cases, memory less property if exists. Simple problems.

Unit- III
Theory of Attributes: Notations, Dichotomy classification, class and class frequencies, order of classes and class frequencies. Ultimate class frequencies, relation between class frequencies. Consistency of data - Conditions for consistency of data for 2 and 3 attributes only. Independence of attributes- criterion of independence of two attributes. Association of attributes-Yule's coefficient of association and coefficient of colligation. Relationship between coefficient of association and colligation and simple problems.

Unit- IV
Correlation: Meaning, Types of Correlation, Measures of Correlation- Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation coefficient (with and without ties), Bi-variate frequency distribution, correlation coefficient for bi-variate data and simple problems.
Multiple and Partial Correlation: Coefficients of multiple and partial correlations, properties of multiple and multiple correlation coefficients, coefficient of multiple determination. simple problems

Unit- V
Curve fitting: Principle of least squares, fitting of straight line, fitting of second degree polynomial or parabola. Fitting of power curve and exponential curves.
Regression Analysis: Introduction, Linear Regression- Regression coefficients, properties of regression coefficients, angle between two lines of regression. Standard error of estimate (residual variance), Explained and unexplained variation, coefficient of determination and simple problems.

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Semester : III
Paper title : Statistical Inference
Course code : STAT31C

Unit- I
Exact Sampling Distributions:
Concepts of Population, Sample, Parameter, Statistic, Sampling distribution, Standard error. law of large numbers, central limit theorem (statements only). Student's t- distribution, F – Distribution, χ^2 -Distribution: Definitions, properties and their applications.

Unit- II
Theory of estimation: Introduction, criteria of a good estimator – unbiasedness, consistency, efficiency, & sufficiency. Statement of Neyman's factorization theorem. Estimation of parameters by the method of moments and maximum likelihood (M.L), properties of MLE's (statements only). Binomial, Poisson & Normal population parameters estimate by MLE method. Interval estimation – construction of confidence intervals for population mean using normal distribution.

Unit- III
Testing of Hypothesis: Concepts of Statistical hypotheses, Null and Alternative hypothesis, Critical region, Type I and II errors, level of significance and Power of a test. One and two tailed tests, p-value. Neyman-Pearson's lemma. Examples in case of Binomial, Poisson, Exponential and Normal distributions.

Unit- IV
Large sample Tests: Test for single mean and difference of two means, test for single proportion and difference of proportions. Simple Problems.
Small Sample tests – I: t-test for single mean, difference of means and paired t-test. F-test for equality of population variances. Simple Problems.

Unit- V
Small Sample tests – II: χ^2-test test for goodness of fit and independence of attributes
Non – Parametric Tests: Non-parametric tests- Advantages and Disadvantages, Measurement scales - Nominal, Ordinal, Interval and Ratio. One sample tests – Sign and Run test. Two sample tests - Median test, Wilcoxon–Mann-Whitney U test, Kruskal – Wallis test or H- test, Run test. Simple Problems.

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Semester : IV

Paper title : Sampling Techniques and Design of Experiments

Course code : STAT41B

Unit- I

Introductory Concepts of sampling :

Concepts of Population and Sample, Basic principles of sample survey, The principles steps in a sample survey, Complete enumeration Vs Sampling, Sampling and non-sampling errors, Limitations of sampling, Types of sampling, Non Probability sampling methods, Probability sampling methods

Simple Random sampling:

SRSWR definition and procedure of selecting a sample, SRSWOR

definition and procedure of selecting a sample , expectation of sample mean and variance of sample mean in srswor and srswr, advantages and disadvantages.

Unit- II

Stratified random sampling:

Stratified random sampling, Advantages and Disadvantages Allocation and types of allocation. Estimation of population mean, and its variance. Comparison between proportional and optimum allocations with SRSWOR.

Systematic sampling:

Procedure of construction, types, merits and demerits of systematic sampling. Comparison of systematic sampling with Stratified and SRSWOR.

Unit- III

Analysis of variance :

Analysis of variance(ANOVA) –Definition and assumptions. One-way classification, Two way classification.(one observation per cell)

Design of Experiments:

Terminology, Principles of design of experiments, CRD: Layout, advantages and disadvantage and Statistical analysis of Completely Randomized Design(C.R.D)

Unit- IV

Randomized Block Design (R.B.D) and Latin Square Design (L.S.D) with their layouts, advantages and disadvantage and Statistical analysis, Missing plot technique in RBD and LSD. Efficiency RBD over CRD, Efficiency of LSD over RBD and CRD.

Unit- V

Factorial experiments – Main effects and interaction effects of 2^2 and 2^3 factorial experiments and their Statistical analysis. Yates procedure to find factorial effect totals.

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Semester : IV

Paper title : Applied Statistics

Course code : STAT01

Unit- I

Index Numbers: Basic problems involved in the construction of index numbers. Construction of index numbers - Simple aggregate, Weighted aggregate, Simple price relative and Weighted price relative methods. The criteria of good index number. Cost of living index number. Uses and Limitations of index number**s.**

Unit- II

Statistical Quality Control – I: Introduction. Basis of SQC. Uses of SQC. Types of controls – Process &Product. Construction of 3-σ limits. Construction of Mean ($\overline{x}$) and Range (R) charts. Interpretation of and R charts.

Unit- III

Statistical Quality Control – II: Construction of p and c charts - Fixed control limits. Interpretation of p and c - charts. Natural and Specification limits. Acceptance sampling inspection plans – AQL, LTPD, AOQL and ASN. OC curves.

Unit- IV

Vital Statistics: Introduction, definition and uses of vital statistics, sources of vital statistics. Measures of different Mortality and Fertility rates, Measurement of population growth. Life tables: construction and uses of life tables.

Unit- V

Statistics in Psychology & Education: Introduction. Scaling procedures – Scaling of scores – Z or σ scores, Standard and normalized scores, T and Percentile scores. Reliability of test scores – Def. index and parallel tests. Methods of determining test reliability. Validity of test scores.

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DEPARTMENT OF TELUGU

HIGHLIGHTED SYLLABUS OF TELUGU

2022-23

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability   ▮ (yellow)

Skill-Development   ▮ (sky blue)

Entrepreneurship   ▮ (green)

CREDITS – 3

SEMESTER–I

TELUGU-I

యూనిట్-I రాజనీతి – నన్నయ మహాభారతము - సభాపర్వం - ప్రథమాశ్వాసంలో 26వ పద్యము "మీవంశమున............ నీవు వారిజైన సర్వ్వేశింగి" నుండి 57వ పద్యము "నాయధాశక్తి .... వాని ననుష్ఠితు ప్రియముతోడ" వరకు.

యూనిట్-II దక్షయజ్ఞం – నన్నెచోదుడు కుమార సంభవం - ద్వితీయాశ్వాసంలో 49వ వచనం "అంతకమున్న............ భయందరాకారముదాల్చిన" నుండి 86వ పద్యం "ప్రమధగణము.... కనిరిశంభు" వరకు.

యూనిట్-III ధామ్మధర్మోపదేశము – తిక్కన మహాభారతము - విరాటపర్వము - ప్రథమాశ్వాసంలో 116వ పద్యం "ఎఱిగెదు వారిర్సినను...............వలయు దగియెదు ముద్దుల్" నుండి 146వ పద్యం "అతడు నియతితోడ........... సంచయములు దగ జపించుచుండె" వరకు.

యూనిట్-IV మధుర స్నేహం – పోతన ఆంధ్రమహాభాగవతము - దశమస్కంధము - కుచేలోపాఖ్యానంలో 962వ పద్యం "లలిత పత్రవ్రాతతిలకంబు............కుపాయమూహింప వైతి" నుండి 983వ పద్యం "తన మృదుతల్పమందు............ ధరణీసురు డెంతటి భాగ్యవంతుడో" వరకు.

యూనిట్-V సీతారావణ సంవాదం – మొల్ల రామాయణము - సుందరకాండములో 40వ వచనం "ఆరామంజూచి....................వృక్షం బారోహించి యుందు" నుండి 87వ పద్యం "కావన నిక్కోమలియెద..................... మనదు దిక్కగు మీదన్" వరకు.

వ్యాకరణము :

1. **సంధులు:-** సవర్ణ, గుణ, యణాదేశ, వృద్ధి, అకార, ఇకార, ఉకార, త్రిక సంధులు.
2. **సమాసములు:-** తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహువ్రీహి సమాసములు.
3. **ఛందస్సు:-** వృత్త పద్యాల్లో ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము. జాతులు, ఉపజాతుల్లో కందము, తేటగీతి, ఆటవెలది మరియు ముత్యాలసరాలు.
4. **అలంకారములు:-** శబ్దాలంకారాల్లో అనుప్రాసాలైన వృత్యనుప్రాస, ఛేకానుప్రాస, లాటానుప్రాస, అంత్యాను ప్రాసములు. **అర్థాలంకారాల్లో** ఉపమ, ఉత్ప్రేక్ష, రూపక, శ్లేషలు.

TELUGU

TEL – 301   2022-23

IB.A.,B.COM.,B.SC

III SEMESTER – SYLLABUS
TELUGU – !
పాఠ్య ప్రణాళిక

యూనిట్ – 1: వ్యక్తీకరణ నైపుణ్యాలు

1. భాష – ప్రథమికాంశాలు: భాష నిర్వచనం, లక్షణాలు, ఆవశ్యకత, ప్రయోజనాలు.

2. వర్ణం – పదం-వాక్యం: వాక్య.లక్షణాలు, సామాన్య; సంయుక్త, సంశ్లిష్ట వాక్యాలు.

3. భాష నిర్మాణంలో 'వర్ణం-పదం-వాక్యం' ప్రాధాన్యత.

యూనిట్ –II : సృజనాత్మక రచన

4. కవితా రచన   :   ఉత్తమ కవిత – లక్షణాలు

5. కథారచన   :   ఉత్తమ కథ – లక్షణాలు

6. వ్యాస రచన   :   ఉత్తమ వ్యాసం – లక్షణాలు

యూనిట్ – III : అనువాద రచన

7. అనువాదం – నిర్వచనం, అనువాద పద్ధతులు.

8. అనువాద సమస్యలు – భౌగోళిక, భాషా, సాంస్కృతిక సమస్యలు, పరిష్కారాలు.

9. అభ్యాసము : ఆంగ్లం నుండి తెలుగుకు అనువదించడం.

యూనిట్ – IV : మాధ్యమాలకు రచన – 1 (ముద్రణా మాధ్యమం/ప్రింటు మీడియా)

10. ముద్రణా మాధ్యమం (అచ్చు మాధ్యమం): పరిచయం, పరిధి, వికాసం.

11. వివిధ రకాల పత్రికలు – పరిశీలన, పత్రికాభాష, శైలి, వైవిధ్యం.

12. పత్రికా రచన : వార్తా రచన, సంపాదకీయాలు, సమీక్షలు – అవగాహన.

యూనిట్ – V : మాధ్యమాలకు రచన – 2 (ప్రసార మాధ్యమం/ఎలక్ట్రానిక్ మీడియా)

13. ప్రసార మాధ్యమాలు : నిర్వచనం, రకాలు, విస్తృతి, ప్రయోజనాలు

14. శ్రవణ మాధ్యమాలు – రచన : రేడియో రచన, ప్రసంగాలు, నాటికలు, ప్రసార సమాచారం.

15. దృశ్య మాధ్యమాలు – రచన : వ్యాఖ్యానం (యాంకరింగ్), టెలివిజన్ రచన

A.G & S.G Siddhartha Degree College, Vuyyuru

TELUGU – II

పాఠ్య ప్రణాళిక

Course Code:TELT21A

యూనిట్ – I

1. ఆధునిక కవిత్వం – పరిచయం
2. కన్యక - గురజాడ వెంకట అప్పారావు
3. కొండవీడు – దువ్వూరి రామిరెడ్డి (కవి కోకిల గ్రంథావళి – ఖండకావ్యాలు - నక్షత్రాల సంపుటి నుండి)
4. మాతృ సంగీతం - అనిసెట్టి సుబ్బారావు (అగ్ని వీణ కవితా సంపుటి నుండి)

యూనిట్ – II

5. తెలుగు కథానిక – పరిచయం
6. భయం / కథ / కాళీపట్నం రామారావు
7. స్వేదం ఖరీదు ?/ కథ / - రెంటాల నాగేశ్వరరావు

యూనిట్ – III

8. తెలుగు 'నవల' – పరిచయం
9. రథచక్రాలు / నవల / - మహీధర రామ్మోహనరావు (సంక్షిప్త ఇతివృత్తం మాత్రమే)
10. రథచక్రాలు / సమీక్షా వ్యాసం / - డా. యల్లాప్రగడ మల్లికార్జున రావు

యూనిట్ – IV

11. తెలుగు నాటకం – పరిచయం
12. యక్షగానము / నాటకము / నాటిక / - ఎం.ఎం.వి.ఎస్.హరనాథ రావు
13. అపురూప కళారూపాల విధ్వంసక దృశ్యం "యక్షగానము" / సమీక్షా వ్యాసం - డా. కందిమళ్ళ సాంబశివరావు.

యూనిట్ – V

14. తెలుగు సాహిత్య విమర్శ - పరిచయం.
15. విమర్శ - స్వరూప స్వభావాలు, ఉత్తమ విమర్శకుడు - లక్షణాలు.

ఆధార గ్రంథాలు / వ్యాసాలు

1. ఆధునిక కవిత్వం - పరిచయం - ప్రొ.ఎస్.సత్యనారాయణ
2. తెలుగు కథానిక - పరిచయం - ప్రొ.రాచపాళెం చంద్రశేఖర రెడ్డి
3. తెలుగు నవల - పరిచయం - వల్లంపాటి వెంకట సుబ్బయ్య
4. సాంఘిక నవల - కథన శిల్పం - ప్రొ.సి.మృణాళిని
5. తెలుగు నాటకం - పరిచయం - ప్రొ.ఎస్.గంగప్ప
6. తెలుగు సాహిత్య విమర్శ - పరిచయం - ప్రొ.జి.వి.సుబ్రహ్మణ్యం
7. నూరేళ్ళ తెలుగు నాటక రంగం - ప్రొ.మొదలి నాగభూషణ శర్మ
8. నాటక శిల్పం - ప్రొ.మొదలి నాగభూషణ శర్మ

Adusumilli Gopala Krishnaiah & Sugar Cane Growers Siddhartha Degree College ofArts & Science, Vuyyuru– 521165, Krishna District, Andhra Pradesh
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DEPARTMENT OF ZOOLOGY

2022-2023

MINUTES OF BOARD OF STUDIES

22-10-2022
ODD SEMESTER

HIGHLIGHTED SYLLABUS OF B.Sc. BZC

Courses on Employability, Entrepreneurship and Skill-Development in the curriculum of all programs are highlighted as mentioned: Employability in yellow Color, Skill-Development in Sky blue colour and Entrepreneurship in Green colour

Employability

Skill-Development

Entrepreneurship

ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165, KRISHNA Dt., A.P. (AUTONOMOUS).

Title of the Paper: **Animal Diversity Biology of Non – Chordates**
Semester: - I

Course Code:ZOOT11A

Syllabus

Unit	Learning Units	Lecture Hours
I	***PROTOZOA AND PORIFERA*** Introduction to Non-chordates – Origin of metazoans Type study: *Polystomella*(structure and life cycle) Locomotion in protozoans Nutrition in protozoans Type study: *Sycon*(Structure, histology and skeleton) Canal system in sponges	**13**
II	***CNIDARIA AND CTENOPHORA*** Type study: *Obelia*. (Structure – polyp and medusa and life cycle) Polymorphism in cnidarians. Corals and coral reefs Ctenophora (structure and affinities)	**10**
III	***HELMINTHES AND ANNELIDA*** Type study: *Fasciola hepatica* (Structure, reproduction, life cycle and pathogenicity) Parasitic adaptations in helminthes Type study: *Ascarislumbricoides*(Structure, reproduction, life cycle and pathogenicity) Type study: *Hirudineria*(Structure, circulatory, excretory and reproductive systems) Coelom and coelomoducts in annelids	**17**
IV	***ARTHROPODA AND MOLLUSCA*** Structural affinities of Onycophora Type study: *Macrobrachiumrosenbergii*(Structure, appendages and Respiratory system) Economic importance of insects (Beneficial – Lac insect, honey bee, *Bombyxmori*and Lady bird; Harmful – house fly, mosquito, locustand bedbug) Metamorphosis in insects Study of Pearl Oyster and Pearl Formation Torsion in gastropods	**14**
V	***ECHINODERMATA AND HEMICHORDATA*** Water-vascular system Echinoderm larvae *Balanoglossus*- Structure and affinities	**6**

Title of the Paper: **Cell Biology, Cellular Metabolism, Genetics, Organic Evolution and Animal Behaviour**
Semester: - III
Course Code: *ZOOT31A*

Syllabus

Unit	Learning Units	Lecture Hours
I	**Cell Biology :** Electron microscopic structure of animal cell. Structure and functions of Golgi complex, Endoplasmic Reticulum And Liposome's Structure and functions of Ribosome's and Mitochondria Structure and functions of Chromosomes (Polygene and Lamp brush chromosomes) Structure and functions of Nucleus and its components	**14**
II	**CELLULAR METABOLISM** Bio molecules Carbohydrates - Classification of carbohydrates; Structure of glucose Proteins - Classification of proteins; General properties of amino acids Lipids - Classification of lipids 1 Hour Carbohydrate metabolism – Glycogen metabolism, Gluconeogenesis Protein metabolism-Transamination, Deamination and Urea Cycle	**11**
III	**GENETICS** Gene interactions (lethal genes, Epistasis & Pleiotropy) DNA damage and repair Human karyotyping and amniocentesis Autosomal and allosomal disorders (Klinefelter syndrome, Turner Syndrome,Down syndrome, Phenylketonuria, Alkaptonuria & Sickle cell anaemia)	**11**
IV	**ORGANIC EVOLUTION** Modern synthetic theory of evolution Variations Isolating mechanisms Types of natural selection (directional, stabilizing & disruptive) Artificial selection Speciation – allopatry and sympatry. Microevolution vs. Macroevolution (Example: Darwin finches)	**10**
V	**ANIMAL BEHAVIOUR** Ethology and its branches. Concepts of Ethology (motivation, fixed action patterns, releasers, learning) Biological clocks Biological rhythms (Circadian, Circalunar and Circannular) Sexual behavior in animals (Intra sexual selection & Inter sexual selection) Coloration & Mimicry	**14**

Title of the Paper:**SUSTAINABLE AQUACULTURE MANAGEMENT**
Course Code: *ZOO-501*
Semester: - V

Syllabus

Unit	Learning Units	Lecture Hours
I	Present status of Aquaculture – Global and National scenario, Major cultivable species for aquaculture: freshwater, brackish water andmarine. Traditional, extensive, modified extensive, semi-intensive and intensive cultures of fish and shrimp. Design and construction of fish and shrimp farms.	**15**
II	Functional classification of ponds – head pond, hatchery, nurseryponds. Functional classification of ponds -rearing, production, stocking and quarantineponds. Need of fertilizer and manure application in cultureponds. Physio-chemical conditions of soil and water optimum for culture (Temperature, depth, turbidity, light, water, PH, BOD, CO2 andnutrients)	**15**
III	Induced breeding infishes Culture of Indian major carps:Pre-stocking management (Dewatering,drying, ploughing/desilting; Predators, weeds and algal blooms and their control, Liming andfertilization) Culture of Indian major carps - Stockingmanagement Culture of Indian major carps - post-stockingmanagement	**10**
IV	Commercial importance of shrimp &prawn *Macrobrachiumrosenbergii*- biology, seedproduction. Culture of *L. vannamei* – hatchery technology and culturepractices Mixed culture of fish andprawns.	**10**
V	Viral diseases of Fin Fish & shellfish Fungal diseases of Fin & Shellfish Bacterial diseases of Finfish & Shellfish Prophylaxis inaquaculture	**10**

Title of the Paper:**POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES**
Course Code: *ZOO-502*
Semester: - V

Syllabus

Unit	Learning Units	Lecture Hours
I	**Handling and Principles of fish Preservation** Handling of fresh fish, storage and transport of fresh fish, post mortem changes (rigor mortis and spoilage), spoilage in marine fish and fresh water fish. Principles of preservation – cleaning, lowering of temperature, rising of temperature, denudation, use of salt, use of fish preservatives, exposure to low radiation of gamma rays.	15
II	**Methods of fish Preservation** Traditional methods - sun drying, salt curing, pickling and smoking. .Advanced methods – chilling or icing, refrigerated sea water, freezing, canning, irradiation and Accelerated Freeze drying (AFD).	08
III	**Processing and preservation of fish and fish by-products** .Fish products – fish minced meat, fish meal, fish oil, fish liquid (ensilage), fish protein concentrate, fish chowder, fish cake, fish sauce, fish salads, fish powder, pet food from trash fish, fish manure. Fish by-products – fish glue, Using glass, chitosan, pearl essence, shark fins, fish Leather and fish maws.	17
IV	**Sanitation and Quality control** Sanitation in processing plants - Environmental hygiene and Personal hygiene in processing plants. Quality Control of fish and fishery products – pre-processing control, control during processing and control after processing.	08
V	**Quality Assurance, Management and Certification** Seafood Quality Assurance and Systems: Good Manufacturing Practices (GMPs); Good Laboratory Practices (GLPs); Standard Operating Procedures (SOPs); Concept of Hazard Analysis and Critical Control Points (HACCP) in seafood safety. National and International standards – ISO 9000: 2000 Series of Quality Assurance System, *Codex Aliment Arius*.	12

Title of the Paper:**Health and Hygiene(Skill Development Course)**
Course Code: *LSCZOOT01*
Semester: - III

Syllabus

Unit	Learning Units	Lecture Hours
I	**BasicsofNutrition** Nutrition – definition, importance, Good nutrition and mal nutrition; BalancedDiet: Basics of MealPlanning Carbohydrates –functions, dietary sources, effects ofdeficiency. Lipids –functions, dietary sources, effects ofdeficiency. Proteins –functions, dietary sources, effects ofdeficiency. Brief account of Vitamins- functions, food sources, effects ofdeficiency, Macro and micro minerals –functions, effects of deficiency; food sources of Calcium, Potassium and Sodium; food sources of Iron, Iodine andZinc Importance of water– functions, sources, requirement and effects of deficiency.	10
II	**Health** Health - Determinants of health, Key Health Indicators, Environment health & Public health; Health-Education: Principles andStrategies Health Policy & Health Organizations: Health Indicators and National Health Policy of Govt. of India-2017; Functioning of various nutrition and health organizations in India viz., NIN (National Institution of Nutrition), FNB (Food and Nutrition Board), ICMR (Indian Council of Medical Research), IDA (Indian Dietetics Association),WHO-India, UNICEF-India National Health Mission: National Rural Health Mission (NRHM) Framework, National Urban Health Mission (NUHM)Framework Women & Child Health Care Schemes: Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+); Janani Shishu Suraksha Karyakaram (JSSK); Rashtriya Bal SwasthyaKaryakram(RBSK); India Newborn Action Plan (INAP); AdolecentHeatlh- Rashtriya Kishor SwasthyaKaryakram(RKSK) Disaster Management – Containment, Control and Prevention of Epidemics and Pandemics – Acts, Guidelines and Role of Government andPublic.	**10**
III	**Hygiene** Hygiene – Definition; Personal, Community, Medical and Culinary hygiene; WASH (**Wa**ter, **S**anitation and **H**ygiene)programme Rural Community Health: Village health sanitation & Nutritional committee (Roles & Responsibilities); About Accredited Social Health Activist (ASHA); Village Health Nutrition Day, Rogi KalyanSamitis Community & Personal Hygiene: Environmental Sanitation and Sanitation in Public places Public Awareness through Digital Media - An Introduction to Mobile Apps of Government of India: NHP, Swasth Bharat, No More Tension, Pradhan Mantri SurakshitMantritva Abhiyan (PM Suman Yojana), My Hospital (Meraaspataal), India fights Dengue, JSK Helpline, Ayushman Bhava, Arogya Setu, Covid19AP	**10**

TITEL OF THE PAPER:-GENERAL SERICULTURE, MULBERRY CULTIVATION AND MANAGEMENT

Unit - I: Introduction

1.1 Definition, history and present status of Sericulture

1.2 Types of silk worms and their food plants

1.3 Prospects of Sericulture in India - Sericulture industry in different states, employment,   potential in mulberry and non-mulberry Sericulture

Unit - II: Morphology of mulberry plant

2.1 Common varieties of mulberry used in India

2.2 Characters of root, stem and leaf

2.3 Anatomy of root, stem and leaf

2.4 Male and female reproductive organs, pollination, fertilization, development of seed.

Unit - III: Requirements for mulberry cultivation

3.1 Physical and chemical properties of soil and its nature

3.2 Soil moisture and water requirements

3.3 Climatic conditions - Temperature, photoperiod, humidity and rain fall

Unit - IV: Mulberry management

4.1 Land preparation - leveling and ploughing

4.2 Irrigation - drip, sprinkler or flood irrigation, weeding

4.3 Manuring - organic, inorganic and biofertilizers

4.4 Harvesting - leaf picking, shoot-leaf harvesting, branch cutting, leaf storage

Unit - V: Diseases and pests of mulberry

3.1 Fungal and bacterial diseases - Powdery mildew, red rust and leaf spot caused by fungi Mulberry wilt caused by bacteria Symptoms; mechanical and chemical control

3.2 Nematode and mycoplasm diseases - Mulberry root-knot and mulberry root rot (nematode diseases), Mycoplasm and viral mulberry disease, Symptoms; mechanical and chemical control

3.3 Caterpillars - Bihar hairy caterpillar, semilooper Bugs - Leaf hoppers and scale insects Beetles - Girdle beetle, powder pest beetle.

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DEPARTMENT OF ZOOLOGY

2022-2023

MINUTES OF BOARD OF STUDIES

25-03-2022
EVEN SEMESTER

HIGHLIGHTED SYLLABUS OF B.Sc. BZC

Courses on Employability, Entrepreneurship and Skill-Development in the curriculum of all programs are highlighted as mentioned: Employability in yellow Color, Skill-Development in Sky blue colour and Entrepreneurship in Green colour

Employability

Skill-Development

Entrepreneurship

ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU-521165, KRISHNA Dt., A.P. (AUTONOMOUS).

Title of the Paper: **Animal Diversity Biology of Chordates**
Course Code: ZOOT21A
Semester: - II

Unit	Learning Units	Lecture Hours
I	UNIT I 1.0. Protochordates to cyclostomes 1.1. Protochordates 1.1.1 Salient features of UrochordataandCephalochordata 1.1.2. Structure and life-history of *Herdmania*, 1.1.3. Significance of retrogressive metamorphosis. 1.2. General organization of vertebrates 1.3. General characters of cyclostomes 1.4. Comparison of *Petromyzon*and*Myxine*1 hour	8 hrs
II	UNIT II 2.0 Fishes 2.1. Type study – *Scoliodon* - Morphology, respiratory, circulatory, excretory and nervous systems and sense organs. 2.2. Migration in fishes. 2.3. Viviparity in fishes 2.4. Types of scales 2.5. Accessory respiratory organs in fishes	13 HOURS
III	UNIT III 3.0. Amphibia 3.1. South Indian Amphibians. 3.2. Type study - *Rana*: Morphology, digestive system, respiratory system circulatory system,excretory system, nervous system and reproductive system 3.3. Parental care in amphibians	11 HOURS
IV	UNIT IV 4.0. Reptilia 4.1. South Indian Chelonians. 4.2. Type study – *Calotes*: Morphology, digestive, respiratory, circulatory, urinogenital and nervous systems. 4.3. Identification of poisonous snakes	11 HOURS
V	UNIT V 5.0. Aves and Mammalia 5.1. Aves 5.1.1 Birds as Glorified Reptiles. 5.1.2. Type study-Pigeon (*Columbialivia*): Exoskeleton, respiratory, circulatory and excretory systems 5.1.3. Significance of migration in birds 5.1.4. Flight adaptations in birds 5.2. Mammalia 5.2.1. Aquatic Mammals 5.2.2. Dentition in Mammals.	17 HOURS

Title of the Paper:**Embryology, Animal Physiology and Animal Ecology.**
Semester: - IV
Course Code: ZOOT41A

Unit	Learning Units	Lecture Hours
I	-------- Embryology Spermatogenesis, Oogenesis and Fertilization.Types of eggs Types of cleavages Development of frog up to gastrulation and formation of primary germ layers Foetal membranes and their significance in chick embryo Placenta in mammals: types and functions	14hrs
II	-------- Physiology – I Digestive system: process of digestion Absorption of digested food Respiratory system - Pulmonary ventilation, transport of oxygen and Carbon dioxide Circulatory system - Structure and functioning of heart, Cardiac cycle. Excretory system - Structure of nephron, urine formation, and counter current Mechanism	
III	--------Physiology - II Nerve impulse -Resting membrane potential, origin and propagation of action potentials along myelinated and non-myelinated nerve fibres Muscle contraction - Ultra structure of muscle fibre, molecular and chemical basis of muscle contraction Endocrine glands - Structure, secretions and the functions (of hormones) of pituitary, thyroid, parathyroid, adrenal glands and pancreas Hormonal control of reproduction in human being	

Title of the Paper: Immunology and Animal Biotechnology
Semester: - IV
Course Code: *ZOOT01*

Syllabus:

I	**UNIT – I** Immunology – I (Overview of Immune system) Introduction to basic concepts in Immunology Innate and adaptive immunity Cells of immune system Organs of immune system Antigens: Basic properties of antigens B and T cell epitopes, haptens and adjuvant Factors influencing immunogenicity	13hrs
II	**UNIT – II** Immunology – II (Antigens, Antibodies, MHC and Hypersensitivity) Antibodies Antigen – antibody reactions Structure of antibody Classes and functions of antibodies Structure and functions of major histocompatibility complexes Exogenous and Endogenous pathways of antigen presentation and processing Hypersensitivity – Classification and Types Basic properties and functions of cytokines Vaccines and Immunization programme	17hrs
III	**UNIT – III** Biotechnology – I (Techniques of Recombinant DNA technology) Genetic Engineering: Basic concept, Vectors, Restriction Endonucleases and Recombinant DNA technology Gene delivery: Microinjection, electroporation, biolistic method (gene gun), liposome and viral-mediated gene delivery PCR: Principle, procedure and advantages of PCR DNA Sequencing: Maxam Gilbert and Sanger's methods of DNA sequencing- traditional and automated sequencing Hybridization techniques: Southern, Northern and Western blotting	11hrs
IV	**UNIT – IV** Biotechnology – II (Cell culture techniques) Animal Cell, Tissue and Organ culture media: Natural and Synthetic media Cell cultures Establishment of cell culture: Primary culture, Protocols for Primary Cell Culture and Secondary culture Types of cell lines: Continuous and Established Cell lines (common examples such as MRC, HeLa, CHO, BHK,Vero) Organ culture; Cryopreservation of cultures Stem cells: Types of stem cells and applications Hybridoma Technology: Production & applications of Monoclonal antibodies(mAb)	11hrs
V	**UNIT – V** Biotechnology – III (Applications of Animal Biotechnology). Tran genesis: Production of Transgenic animals: sheep and fish Ethical, Legal, Social and Disposable issues of Genetically Modified Organisms Manipulation of reproduction in animals: Artificial Insemination, *In vitro* fertilization, super ovulation, Embryo transfer, Embryo cloning Applications in Industry: Fermentation: Different types of Fermentation and Downstream processing	8hrs

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Title of the Paper:**Poultry Farming**
Semester: - II
Course Code: PF-201

SKILL DEVELOPMENT COURSE	Course code: PF-201	*2021-2022*	I BA, MPCS, MSCS & MCCS, ABC&BZC,

Syllabus
Course Details

Unit	Learning Units	Lecture Hours
I	**Section I (Introduction to Poultry Farming):** General introduction to poultry farming -Definition of Poultry; past and present scenario of poultry industry in India. Principles of poultry housing. Poultry houses. Systems of poultry farming. Management of chicks, growers and layers. Management of Broilers. Preparation of project report for banking and insurance	10
II	**Section II (Feed and Livestock Health Management):** Poultry feed management – Principles of feeding, Nutrient requirements for different stages of layers and broilers. Feed formulation and Methods of feeding. Poultry diseases – viral, bacterial, fungal and parasitic (two each); symptoms, control and management; Vaccination programme.	**10**
III	**Section III (Harvesting of Eggs and Sanitation):** Selection, care and handling of hatching eggs. Egg testing .Methods of hatching. Brooding and rearing. Sexing of chicks. Farm and Water Hygiene, Recycling of poultry waste.	**10**

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DEPARTMENT OF ZOOLOGY
B.Sc. AQUACULTURE

HIGHLIGHTED SYLLABUS OF B.Sc. AQUACULTURE
2022-2023

Syllabus in Relevance to Employability, Skill Development and Entrepreneurship **is** highlighted as mentioned: Employability in yellow Color, Skill Development in Sky blue colour and Entrepreneurship in Green colour

Employability ▭

Skill-Development ▭

Entrepreneurship ▭

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Title of the Paper:**Basic Principles of Aquaculture**

Semester: - I

Course Code: *AQTTI1A*

Unit	Learning Units	Lecture Hours
I	UNIT-I (Introduction) Definition and History of Aquaculture Concept of Blue Revolution and Pradhan Mantri MatsyaSampada Yojana (PMMSY) Present status of Aquaculture at global level, India and Andhra Pradesh Aquaculture versus Agriculture; Present day needs with special reference to Andhra Pradesh. Aquaculture resources: Ponds ,tanks, lakes ,reservoirs etc. Capture and Culture fisheries; Advantages of culture fishery over capture fishery	11
II	UNIT-II (Types of Fish Ponds) Lotic and lentic systems, streams and springs Classification of ponds based on water resources – spring, rain water, flood water, well water and water course ponds Functional classification of ponds – head pond, hatchery, nursery, rearing, production and stocking ponds; quarantine ponds, isolation ponds and wintering ponds Hatchery design	**11**
III	UNIT- III (Design and Construction of Aqua Farms) Important factors in the construction of an ideal fish pond – site selection, topography, nature of the soil, water resources Lay out and arrangement of ponds in a fish farm Construction of an ideal fish pond – space allocation, structure and components of barrage Pond	**10**
IV	**UNIT-IV (Aquaculture Systems and Practices)** Types of aquacultureFresh water aquaculture - Brackish water aquaculture **-** Mari culture Aquaculture Systems – Pond, Raceways, Cage, Pen, Rafts, Running water, Water	**12**

	Recirculating Systems, Biofloc Technology and 3-C System Pond culture practices Fin fish culture methods - Monoculture, Polyculture and Monosexcultureand Integrated fish farming.		
V	**UNIT-V** (**Management Factors of Culture Ponds** **Pre-stocking Management** Dewatering, drying, ploughing/desilting Liming and fertilization; Need of fertilizer and manure application, NPK contents of different fertilizers and manures and precautions in their Application Predators, weeds and weed fish in culture ponds - Advantages and disadvantages of weed plants; Toxins used for weed control and control ofpredators. Algal blooms and their control **Stocking Management** – Stocking density and stocking **Post-stocking Management**Feeding: Role of nutrients Water quality: Physico-chemical conditions of soil and water optimum for culture temperature, depth, turbidity, light, water and shore currents, PH, DOD, CO_2, NH_3, NO_2 and nutrients Measures to increase oxygen and reduce ammonia & hydrogen sulphide in culture ponds; correction of PH	**14**	

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Title of the Paper:**Fresh water & Brackish water Aquaculture**
Semester: - III
Course Code: AQTT31A

Syllabus
Course Details

Unit	Learning Units	Lecture Hours
I	**Freshwater Fin Fish Aquaculture** Status, scope and prospects of fresh water aquaculture in the world, Ind and AP Criteria for the selection of species for culture Natural seed resources and procurement of seed for stocking Culture of cultivable major Indian carps–*Labeo, Catla*and*Cirrhinus* And Minor carps Culture of Exoticfish species – *Tilapia,Pangassius*and*Clarius species* Impact of exotic fish, compatibility of Indian and exotic carps and Competition among them Composite fish culture system of Indian and exotic and genetically modified carps (Amur common carp, Jayanthi Rohu	13
II	**Freshwater Shell Fish Aquaculture** Fresh water prawns of India -commercial value Natural seed resources and procurement of seed for stocking *Macrobrachiumrosenbergii*– biology, seed production, pond preparation, stocking,	**14**

	Managementofnurseryandgrow-outponds,feeding,morphotypesand harvesting *M. malcolmsonii* - biology, seed production, pond preparation,stocking, Managementofnurseryandgrow-outponds,feeding,morphotypesand harvesting	
III	**Brackish Water Fin Fish Aquaculture** Status, scope and prospects of brackishwateraquacultureintheworld,India and AP Major cultivable species for brackish water aquaculture Biology and culture of *Latescalcarifer* Biology and culture of *Chanoschanos* Biology and culture of *Mugilcephalus* Biology and culture of *Etroplussuratensis* Biology and culture of *Trachinotus*sps (Pampano)	**15**
IV	**Brackish Water Shell Fish Aquaculture-I** Cultureof*P.mondon*–Hatchery technology and culture practices including feed and Disease management Cultureof*L.vannamei* Hatchery technology and culture practices including feed and Disease management**.** Mixed culture of fish and prawns	**11**
V	**Export – oriented Brackish Water Shell Fish Aquaculture-II** Biology and culture of *Scylla serrata* Biology and culture of *Pinctada vulgaris* Biology and culture of *Crassostrea* species	**07**

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Title of the Paper:**AQUARIUM MANAGEMENT AND ORNAMENTAL FISH CULTURE**

Course Code: SECAQU-601C

Semester: - V

Syllabus
Course Details

Unit	Learning Units	Lecture Hours
I	Aquarium design and Construction **Introduction** to aquarium. World aquarium trade and present status. Design and construction of home and public aquaria (freshwater and marine), oceanarium. Aquarium accessories - Aerators, filters (different types) and lighting. Water quality requirements.	13
II	**Aquarium Management** Setting up of aquarium – under gravel filter, pebbles, plants, drift wood, ornamental objects and selection of fishes, Quarantine measures. Aquarium maintenance and water quality management for freshwater and marine aquariums. Handling, care, packing and transportation of fishes - Use of anaesthetics. Temperature acclimation	**14**
III	**Freshwater Ornamental Fishes** Species of ornamental fishes - their taxonomy and biology- Live bearers, Gold fish and Koi, Gourami, Barbs and Tetras, angel fish,cichlids. Maturation, secondary sexual characters, breeding habits, spawning, parental care, fertilization and development of eggs. Hatching, larval rearing and their health.	**15**

IV	**Commercial Production** Commercial production of goldfish, live bearers, gouramies, barbs and tetras, angelfish. Natural ponds for the mass production of ornamentalfishes. Multiplication of aquarium plants – different methods.	**11**
V	**Marine Ornamental Fishes** Marine ornamental fishes – varieties and their habitat. Major marine ornamental fish resources of India. Method of collection of live fish. Breeding of marine ornamental fishes (clown fishes and Damselfishes).	**07**

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Title of the Paper:**POSTHARVEST TECHNOLOGY OF FISH AND FISHERIES**
Semester: - V
Course Code: *SECAQU-602C*

Syllabus
Course Details

Unit	Learning Units	Lecture Hours
I	**Handling and Principles of fish Preservation** Handling of fresh fish, storage and transport of fresh fish, post mortem changes (rigor mortis and spoilage), spoilage in marine fish and freshwater fish. Principles of preservation – cleaning, lowering of temperature, rising of temperature, denudation, use of salt, use of fish preservatives, exposure to low radiation of gamma rays.	**15**
II	**Methods of fish Preservation** Traditional methods - sun drying, salt curing, pickling and smoking. .Advanced methods – chilling or icing, refrigerated sea water, freezing, canning, irradiation and Accelerated Freeze drying (AFD).	**08**
III	**Processing and preservation of fish and fish by-products** .Fish products – fish minced meat, fish meal, fish oil, fish liquid (ensilage), fish protein concentrate, fish chowder, fish cake, fish sauce, fish salads, fish powder, pet food from trash fish, fish manure.	**17**

	Fish by-products – fish glue, Using glass, chitosan, pearl essence, shark fins, fish Leather and fish maws.	
IV	**Sanitation and Quality control** Sanitation in processing plants - Environmental hygiene and Personal hygiene in processing plants. Quality Control of fish and fishery products – pre-processing control, control during processing and control after processing.	**08**
V	**Quality Assurance, Management and Certification** Seafood Quality Assurance and Systems: Good Manufacturing Practices (GMPs); Good Laboratory Practices (GLPs); Standard Operating Procedures (SOPs); Concept of Hazard Analysis and Critical Control Points (HACCP) in seafood safety. National and International standards – ISO 9000: 2000 Series of Quality Assurance System, *Codex Aliment Arius*.	**12**

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Title of the Paper:**Biology of fine fish &shell fish**

Course Code: *AQTT21A*

Semester: - II

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Classification of Finfish and Shell fish** Classification of fishes up to the level of Class. Classification of crustaceans up to the level of Class **Finfish and Shell fish of** **Commercial Importance** Cultivable fin fish Cultivable shell fish Sense organs of fishes and crustaceans Specialized organs in fishes – electric organ, venom and toxins buoyancy in fishes- swim bladder and mechanism of gas secretion	**11**
II	**Food, Feeding and Growth** Natural fish food Feeding habits, feeding intensity, stimuli for feeding, utilization of food Gut content analysis. Structural modifications in relation to feeding habits. Forage ratio and food selectivity index **Age and Growth** Principles of Age and growth determination Growth regulation Growth rate measurement – scale method, otolith method, skeletal parts as age indicators **Genetic**, **biotic & ecological factors in determining the**	**17**

	longevity of fishes Length frequency method, age composition, age-length keys, absolute and specific growth, back calculation of length and growth, annual survival rate, asymptomatic length, fitting of growth curve . Length-weight relationship Condition factor/Ponderal index, relative condition factor	
III	**Reproductive Biology** **Breeding in Fishes** .Breeding habits & breeding grounds Breeding in natural environment and in artificial ponds, courtship Reproductive cycles Induced breeding in fishes **Breeding in shrimp** **Breeding in pearl oyster**	**09**
IV	Development Ovo-viviparity, oviparity, viviparity in fishes Parental care in fishes, nest building and brooding Embryonic and larval development of fishes Embryonic and larval development of shrimp Embryonic and larval development of crabs Environmental factors affecting reproduction and development of cultivable Aquatic fin & shellfish	**12**
V	**5.0. Hormones & Growth** Endocrine system in fishes Neurosecretorycells,androgenicgland,ovary,Y-organ,chromatophores, Pericardial glands and cuticle. Molting, molting stages, metamorphosis in crustacean shellfish	**11**

Title of the Paper: **Fish Nutrition & Feed Technology**
Course Code: *AQTT01*
Semester: - IV

Syllabus

Unit	Learning Units	Lecture Hours
I	**Nutritional requirements of cultivable fish and shellfish** Classification of nutrients; Nutritional requirements (energy, proteins, carbohydrates, lipids, fiber, micronutrients) of different stages of cultivable fish and shellfish. Essential amino acids and fatty acids, protein to energy ratio, nutrient interactions and protein sparing effect Dietary sources of energy, effect of ration on growth, determination of feedingrate, check tray, factors affecting energy partitioning and feeding Importance of natural and supplementary feeds, balanceddiet**.**	10
II	**Types of feeds and Feed additives** Live foods**:** Fish food organisms – Bacterioplankton, phytoplankton, zooplankton and their role in larvalnutrition. Artificial feeds: Supplementary feed stuffs; Non-conventional feed ingredients; Forms of processed feeds - wet feeds, moist feeds, dry feeds, mashes, pelleted feeds - floating and sinking pellets; advantages of pelletization Water stability feeds, farm made aqua feeds, micro-coated feeds, micro-encapsulated feeds and micro-bound diets Feed additives: Binders, antioxidants, probiotics, enzymes, pigments, growth promoters, feed stimulants; use of preservatives.	**10**
III	**Feed formulation, manufacture & storage** Feed ingredients**:** selection, nutrient composition and nutrient availability. Feed formulation and manufacturing – extrusion processing and steam pelleting - grinding, mixing and drying, pelletization, and packing Microbial ,insect and rodent damage of feed, chemical spoilage during storage period and feed storage methods.	**15**
IV	**Feeding methods** Feeding devices and methods: Manual feeding, demand feeders, automatic feeders, surface spraying, bag feeding & tray feeding Feeding schedules: Frequency of feeding, feeding rates and ration size Feed evaluation: feed conversion ratio, feed conversion efficiency and protein efficiency ratio.	**15**
V	**Nutritional pathology of fish and shrimp** Protein(Essential amino acid) and Lipid (Essential fatty acid) deficiency disorders; Fatty liver disease in fishes Vitamin and mineral deficiency disorders Anti-nutrients and afflatoxins.	**10**

Title of the Paper:**Fish Health Management and Fisheries Economics, Extension and Marketing**
Semester: - IV
Course Code: *AQTT42*

Syllabus

Unit	Learning Units	Lecture Hours
I	**DISEASES OF FIN FISH** Fungal diseases– Saprolegniasis, branchiomycosis, ichthyophiriasis diseases –Lagenidiumdiseases – Fusarium disease, prevention andtherapy Viral diseases – Emerging viral diseases in fish, haemorrhagicscepticemia, springviremia of carps, infectious hematopoietic necrosis in trout,infectious pancreatic necrosis in salmonids, swim-bladder inflammation in cyprinids, channel cat fish viral disease, prevention andtherapy Bacterial diseases – Emerging bacterial diseases, *Aermonas,Pseudomonas* and*Vibrio*infections, columnaris, furunculosis, epizootic ulcerative syndrome, infectious abdominal dropsy, bacterial gill disease, enteric red mouth, bacterial kidney disease, proliferative kidney disease, prevention and therapy	10
II	**DISEASES OF SHELL FISH** Major shrimp viral diseases – *Bacculoviruspenaeii, MonodonBacculovirus*, Bacculoviralmidgut necrosis, Infectious hypodermal and haematopoietic necrosis virus, Hepatopancreaticparvo like virus, Yellow head bacculovirus, white spotbacculovirus. Bacterial diseases of shell fish – aeromonas, pseudomonas and vibrio infections, Luminous bacterial disease, filamentous bacterial disease. Prevention and therapy Protozoan diseases- Ichthyophthiriasis, Costiasis, whirling diseases,trypanosomiasis.Prevention and therapy	**10**
III	**FISH HEALTH MANAGEMENT** Diagnostic tools – immune detection- DNA/RNA techniques, General Preventive methods and prophylaxis. Application and development of vaccines. Quarantine – Significance, methods and regulations for trans plants**.** Good Feed management for healthy organisms, Zero water exchange, Probiotics in health management, Issues of bio security	**15**
IV	**FISHERIES ECONOMICS** Meaning and scope of economics with reference to fisheries Principles of aquaculture economics – Capital costs, variable costs, cost- benefit analysis **.**Aquaculture economics- Application of economics principles to aquaculture operations Various inputs and production function, laws of variable proportions Cost and earnings of aquaculture systems – carp culture, shrimp farming systems, hatcheries, Cost and earnings of fishing units and freezing plants Socio-economic conditions of fishermen in Andhra Pradesh Role of Matsya fed and NABARD in uplifting fishermen's conditions, fishermen Cooperatives, Contribution of fisheries to the national economy	**15**
V	**FISHERIESEXTENSION AND MARKETING** Fisheries extension-scope and objectives,principles and featuresof fisheries Extension education Fisheries extension methods and rural development Fisheries Training and Education in India; Role of extension in community development Fish marketing methods in India; Basic concepts in demand and price analysisMethods of economic analysis of business organizations Preparation of project and project appraisal	**10**