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

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 ☐

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SEM -1 Fundamentals of microbes and non vascular plants　　　　　**2021-22**

SYLLABUS

UNIT – I	**Origin of life and viruses** Origin of life, concept of primary Abiogenesis; Miller and Urey experiment. Five kingdoms classification of R.H. Whittaker. Discovery of microorganisms, Pasteur experiments, germ theory of diseases. Shape and symmetry of viruses; structure of TMV and Gemini virus;multi plication of TMV, a brief account of Prions and Viroids A general account on symptoms of plant diseases caused by Viruses.Transmission of plant virusesand their control. Significanceof viruses in vaccine production, bio-pesticides
UNIT – 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 and industry (fermentation and medicine) A general account on symptoms of plant diseases caused by Bacteria; Citrus canker
UNIT – III	**Fungi & Lichens** eral characteristics of fungi and Ainsworth classification (upto classes). cture, 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.
UNIT – IV	General characteristics of Algae (pigments, flagella and reserve food material), Fritsch classification (upto 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.
UNIT – V	**Bryophytes** General characteristics of Bryophytes; classification upto 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.

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

Semester: III

SYLLABUS

Unit – 1	**Anatomyof Angiosperms** Organization of apical meristems: Tunica-carpus theory and Histogentheory. Tissue systems–Epidermal, ground andvascular. Anomalous secondary growth in *Boerhaavia* and*Dracaena.* Study of timbers of economic importance - Teak, Red sanders andRosewood.
Unit – 2	**Embryology of Angiosperms** Structure of anther, anther wall, types of tapetum. Microsporogenesisand development of malegametophyte. Structure of ovule, megasporogenesis; monosporic (*Polygonum*), bisporic (*Allium*) and tetrasporic (*Peperomia*) types of embryo sacs. Outlines of pollination, pollen – pistil interaction and fertilization. Endosperm - Types and biological importance - Free nuclear, cellular, helobial and ruminat Development of Dicot (*Capsella bursa-pastoris*)embryo.
Unit – 3	**BasicsofEcology** Ecology: definition, branches and significance ofecology. Ecosystem: Concept and components, energy flow, food chain, food web, ecological pyramids. Plants and environment: Climatic (light and temperature), edaphic and biotic factors. Ecological succession: Hydrosere andXerosere.
Unit – 4	**Population, Community andProductionEcology** Population ecology: Natality, mortality, growth curves, ecotypes,ecads Community ecology: Frequency, density, cover, life forms, biologicalspectrum Concepts of productivity: GPP, NPP and CommunityRespiration Secondary production, P/R ratio andEcosystems
Unit – 5	**Basicsof Biodiversity** Biodiversity: Basic concepts, Convention on Biodiversity - EarthSummit. Value of Biodiversity; types and levels of biodiversity and Threats tobiodiversity Biodiversity Hot spots in India. Biodiversity in North Eastern Himalayas and WesternGhats Principles of conservation: IUCN threat-categories, RED databook Role of NBPGR and NBA in the conservation ofBiodiversity.

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Title of the Paper: Cell Biology, Genetics andPlant Breeding   **Semester: V**

SYLLABUS

UNIT-I	**Cell Biology** Cell, Ultra Structure and functions of cell wall. Molecular Organization of cell membranes. Chromosomes; morphology, organization of DNA in a chromosome (Nucleosome model) Euchromatin and Heterochromatin.
UNIT-II	**Genetic Material** DNA as the Genetic Material: Griffith's and Avery's Transformation Experiment. Hershey - Chase Bacteriophage experiment. DNA Structure (Watson & crick model) and replication of DNA (SemiConservative). Types of RNA (mRNA, tRNA, rRNA), their structure and function.
UNIT- III	**Mendelian Inheritance** Mendelian Inheritance (Mono – Di-hybrid Crosses), Back cross and Text cross. Linkage: concept, complete and In-complete Linkage, Coupling and Repulsion; LinkageMaps Based on Two and Three Point cross. Crossing over concept and significance.
UNIT-IV	**Gene Expression** Organization of gene, Transcription and Translation. Mechanism and regulation of Gene Expression in Prokaryotes (Lac operon). Mutations: Chromosomal Aberrations, Gene Mutations and Transposable Elements
UNIT-V	**Plant Breeding** Introduction and objectives of Plant Breeding. Methods of Crop Improvement: Procedure, Advantages and limitations of Introduction, Selection and Hybridization (Out lines only).

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Title of the Paper: PLANT ECOLOGY & PHYTOGEOGRAPHY   Semester:V

SYLLABUS

UNIT-I	**ELEMENTS OF ECOLOGY** Definition, branches and significance of ecology. Claimatic factors: Light, Temperature. Edaphic factor: Origin, formation, composition and soil profile. Biotic factor, Ecological adaptations of Plants.
Unit– II	**Ecosystem Ecology** Ecosystem: concept and components, energy flow, food chain, food web, Ecological Pyramids. Productivity of ecosystem-Primary, Secondary and Net productivity. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.
Unit –III	**Population & Community ecology** Population- defination, characteristics and importance (Density, Natality, Mortality, Growth Curves) outlines- ecotypes. Plant communities- characters of a community, outlines – Frequency, density, cover, life forms, Biological Spectrum. Ecological Succession: Hydrosere and Xerosere.
Unit-IV	**Phytogeography** Principles of Phytogeography, Distribution (Wides, Endemic, Discontinous species. Phytogeography regions of India. Endemism – types and Causes.
Unit-V	**Plant Biodiversity and its Importance** Definition, Levels of Biodiversity – genetic, species and ecosystem. Biodiversity and Hot-spots of India: North Eastern, Himalayas and Western Ghats. Loss of Biodiversity-causes and Conservation (In-situ and Ex-Situ Methods).

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DEPARTMENT OF BOTANY

HIGHLIGHTED SYLLABUS OF BOTANY

EVEN

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

Title of the Paper: Basics of Vascularplants and Phyto geography
(Pteridophytes, Gymnoperms, Taxonomy ofAngiosperms andPhytogeography)   Semester : II

Syllabus

CourseDetails

Unit	LearningUnits	Lecture Hours
I	**Pteridophytes** GeneralcharacteristicsofPteridophyta; classification of Smith (1955) upto divisions. Occurrence, morphology, anatomy, reproduction (developmentaldetails are not needed) and life history of (a) *Lycopodium* (Lycopsida) and (b)Marsilea (Filicopsida). StelarevolutioninPteridophytes Heterosporyandseedhabit.	12
II	**Gymnosperms** General characteristics ofGymnosperms; Sporne classification upto classes. Occurrence,morphology,anatomy, reproduction (developmental details are not needed)and life history of(a)*Cycas(Cycadopsida)*and (b) *Gnetum*(Gnetopsida). Outlinesofgeologicaltimescale. AbriefaccountonCycadeoidea	12
III	**BasicaspectsofTaxonomy** Aim and scope of taxonomy; Species concept: Taxonomic hierarchy, species,genus andfamily. Plant nomenclature: Binomial system, ICBN– rules for nomenclature. Herbarium and its techniques, 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	
IV	**SystematicTaxonomy** Systematic description andeconomic importance of the following families: (a) Asteraceae (b)Asclepiadaceae (c)Amaranthaceae (d)Euphorbiaceae(e)Orchidaceae (f)Arecaceae(i)Poaceae Outlines of Angiosperm PhylogenyGroup (APGIV).	12
V	**Phytogeography** Principles of Phytogeography, Distribution (wides, endemic,discontinuousspecies) Endemism–typesandcauses. PhytogeographicregionsofWorld. PytogeographicregionsofIndia. VegetationtypesinAndhraPradesh	12

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

SYLLABUS

Unit – 1	**Plant - water relations** Importance of water to plant life, physical properties of water, diffusion, Imbibition, Osmosis**.** Water potential, osmotic potential, pressurepotential. Absorption and lateral transport of water; Ascent ofsap Transpiration: stomata structure and mechanism of stomatal movements (K^+ ion flux). Mechanism of phloem transport; source-sink relationships.
Unit – 2	**Mineral nutrition, Enzymesand Respiration** **14 HRS** Essential macro and micro mineral nutrients and their role in plants; symptoms of mineral deficiency**.** Absorption of mineral ions; passive and activeprocesses. Characteristics, nomenclature and classification of Enzymes. Mechanism of enzyme action, enzymekinetics. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, Pentose Phosphate Pathway (HMP shunt).
Unit – 3	**Photosynthesis and Photorespiration** **12 HRS** Photosynthesis: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancementeffect Concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen;photophosphorylation Carbon assimilation pathways (C3,C4 andCAM);Photorespiration - C2pathway
Unit – 4	**Nitrogen andlipid metabolism** **12 HRS** Nitrogen metabolism: Biological nitrogen fixation – asymbiotic and symbiotic nitrogen fixing organisms. Nitrogenase enzymesystem. Lipid metabolism: Classification of Plant lipids, saturated and unsaturated fatty acids. Anabolism of triglycerides, β-oxidation of fatty acids, Glyoxylatecycle.
Unit – 5	**Plant growth – development and stress physiology** **12 HRS** Growth and Development: Definition, phases and kinetics ofgrowth. Physiological effects of Plant Growth Regulators (PGRs) - auxins, gibberellins, cytokinins, ABA, ethylene andbrassinosteroids. Physiology of flowering:Photoperiodism, role of phytochrome inflowering. Seed germination and senescence; physiologicalchanges**.**

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Title of the Paper: **Cell Biology, Genetics and Plant Breeding**   Semester: IV

SYLLABUS

Unit – 1	**The Cell:**	**12 Hrs.**
	Cell theory; prokaryotic vs eukaryotic cell; animal vs plant cell; a brief account on ultra-structure of a plantcell.Ultra-structure of cellwall.Ultra-structure of plasma membrane and various theories on itsorganization.Polymorphic cell organelles (Plastids); ultra structure of chloroplast. PlastidDNA.	
Unit – 2	**Chromosomes:**	**11Hrs.**
	Prokaryotic vs eukaryotic chromosome. Morphology of a eukayoticchromosome.	
	Euchromatin and Heterochromatin; Karyotype andideogram.	
	Brief account of chromosomal aberrations - structural and numericalchanges	
	Organization of DNA in a chromosome (nucleosomemodels).	
Unit – 3	**Mendelian andNon-Mendelian genetics**	**14Hrs.**
	Mendel's laws of inheritance. Incomplete dominance and co-dominance; Multiple allelism.	
	Complementary, supplementary and duplicate gene interactions (plant based examples are to bedealt).	
	A brief account of linkage and crossing over; Chromosomal mapping - 2 point and 3 point testcross.	
Unit – 4	**Structure and functionsof DNA**	**12 Hrs.**
	Watson and Crick model of DNA. Brief account on DNA Replication (Semi-conservativemethod).	
	Brief account on Transcription, types and functions of RNA. Gene concept and genetic code andTranslation.	
	Regulation of gene expression in prokaryotes - LacOperon.	
Unit – 5	**Plant Breeding** **12 Hrs.**	
	Plant Breeding and its scope; Genetic basis for plant breeding. Plant Introduction andacclimatization.	
	Definition, procedure; applications and uses; advantages and limitations of :(a) Mass selection, (b) Pure line selection and (c) Clonalselection.	
	Hybridization – schemes, and technique; Heterosis(hybridvigor).	
	A brief account on Molecular breeding – DNA markers in plant breeding. RAPD, RFLP.	

Title of the Paper: **Plant tissue culture and its Biotechnological applications**

Semester: **VI**

SYLLABUS

Unit – 1	LANT TISSUE CULTURE – 1 (12hrs) istory of plant tissue culture research - basic principles of plant tissue callus culture, Meristem culture, organ culture, Totipotency of cells. Sterilization procedures, culture media mcomposition and preparations of explanats. Murashige and Skoog's (MS medium), Cell and protoplast culture. Somatic Hybrids and Cybrids (out lines), Artificial Seeds, Somaclonal variations. pplications of Tissue culture (Brief account).
Unit – 2	**Plant Tissue culture -2** (12hrs) **En**dosperm culture – Embryo culture -culture requirements – applications, embryo rescue technique..Cryopreservation; Germ plasm conservation.
Unit – 3	**Recombinant DNA technology** (12hrs) r-DNA technology: Steps in r-DNA technology and tools Cloning Vectors: Prokaryotic (pBR322, Ti plasmid and Lambda phage, Eukaryotic Vectors (YAC and briefly PAC) Gene cloning (Bacterial Transformation and selection of recombinant clones, PCR Mediated gene cloning)
Unit – 4	**Methods of gene transfer** (12hrs) Methods of gene transfer- Agrobacterium-mediated, direct gene transfer By Electroporation, icroinjection, Micro projectile bombardment. Selection of transgenics– selectable marker and reporter genes (Luciferase, GUS, GFP).
Unit – 5	**Applications of Biotechnology** **(12 hrs)**Applications of Plant Genetic Engineering – crop improvement, herbicide resistance, insect resistance, virus resistance.Genetic modification – transgenic plants for pest resistant (Bt-cotton); herbicide resistance (Round Up Ready soybean); improved agronomic traits flavrSavr tomato, Golden rice.

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Title of the Paper: **Plant diversity and Human welfare**   **Semester:** VI

SYLLABUS

Unit – 1	**Plant diversity and its scope**: **(12hrs)** Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro biodiversity and Vavilov Crop centers. Values and uses of biodiversity: Ethical and aesthetic values, Uses of plants.
Unit – 2	**Loss of biodiversity**: **(12hrs)** Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro biodiversity, projected scenario for biodiversity loss. Management of plant biodiversity: Organizations associated with biodiversity Management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Biodiversity legislation and conservations, Biodiversity information management and Communication.
Unit – 3	**Contemporary practices in resource management**: **(12hrs)** Environmental Impact Assessment (EIA), Geographical Information System GIS, Solid and liquid waste management.
Unit – 4	**Conservation of biodiversity** **(12hrs)** Conservation of genetic diversity, species diversity. Social approaches to conservation, Biodiversity awareness Programmes,Sustainable development.
Unit – 5	**Role of plants in relation to Human Welfare** **(12hrs)** Importance of forestry, their utilization and commercial aspects- a) Avenue trees, b) ornamental plants of India. Fruits and nuts: Important fruit crops their commercial importance. Wood, fiber and their uses.

Title of the Paper: **Ethno Botany and Medicinal Botany**   Semester: VI

SYLLABUS

Unit – 1	**Ethnobotany**(12hrs) Introduction, concept, scope and objectives Major and minor ethnic groups or Tribal's of India, and their lifestyles. Plants used by the tribal populations: a) Food plants, b) Intoxicants c) Beverages, d) Resins and oils and miscellaneous uses.
Unit – 2	**Role of ethnobotany in modern Medicine**(12hrs) Role of Ethnobotany in modern medicine with special example; Rauvolfiasepentina, Artemisia annua, Withaniasomnifera. Significance of the following plants in ethno botanical practices (along with their habitat and morphology) a)Azadirachtaindica, b)Vitexnegundo,c)Ocimum sanctum,,d) phyllanthus niruri Medico-Ethnobotanical Sources of India.
Unit – 3	**Ethno botany as a tool to protect interests of ethnic groups**(12hrs) Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge
Unit – 4	**History, Scope and Importance of Medicinal Plants, Indigenous Medicinal Sciences**(12hrs) Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments. Homeopathy: Origin of Homeopathy medicinal systems, Basis of Homeopathy, plants used in Homeopathy medicine.
Unit – 5	**Conservation of endangered and endemic medicinal plants** (12hrs) Definition: endemic and endangered medicinal plants.2. Red list criteria In situ conservation: Sacred groves, National Parks. Ex situ conservation: Botanical Gardens, Seed Banks.

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Title of the Paper: **Pharmacognosy and Phytochemistry**   Semester: VI

SYLLABUS

Unit – 1	**Pharmacognosy** Definition, Importance Classification of drugs - Chemical and Pharmacological Drug evaluation methods	**(12hrs)**
Unit – 2	**Organoleptic and microscopic studies:** Organoleptic and microscopic studies with reference to nature of active principles and common adulterants of a) Adhatoda vasica(leaf) b) Strychnosnuxvomica (seed), c)Rauwolfia serpentina(root) d)Zinziberofficinalis e)Catharanthusroseus.	**(12hrs)**
Unit – 3	**Secondary Metabolites** Definition of primary and secondary metabolites and their differences, Major types - terpenes, Phenolics, alkaloids, terpenoids, steroids .A brief idea about extraction of alkaloids. Origin of secondary metabolites–detailedaccount of Mevalonate pathway, Shikimate pathway.	**(12hrs)**
Unit – 4	**Phytochemistry:** Biosynthesis and sources of drugs: Structural type biosynthesis importance of simple Phenolic compounds, coumarins, Flavonoids. Steroids, sterols: Biosynthesis, commercial importance. Alkaloids: Different groups, biosynthesis, bioactivity. Volatile oils, aromatherapy.	**(12hrs)**
Unit – 5	**Enzymes, proteins and amino acids as drugs**: Vaccines, toxins and toxoids, immune globulins, antiserums, Vitamins, Antibiotics – chemical nature, mode of action. Pharmacological action of plant drugs – tumor inhibitors, PAF antagonists, antioxidants, phytoestrogens and others.	**(12hrs)**

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TitleofthePaper: Plant Nursery Management

Syllabus

Unit	LearningUnits	Lecture Hours
I	**IntroductiontoPlantNursery** 1. Plant nursery: definition , importance. 2. Different types of nurseries on the basis of duration, plant parts used for propagation. 3. Basic facilities for anursery:lay out and components of a good nursery 4. Plant propagation structures inbrief 5. Bureau of Indian standards (BIS-2008)related to nursery.	6
II	**BasicRequirementsforNursery** 1. Nurserybeds–typesandprecautionstobetakenduringpreparation. 2. Growing media, nursery toolsandimplements, containers forplantnurseryinbrief. 3. Outline of vegetative propagation technique to produceplanting material. 4. Sowingmethodsofseedsandplantingmaterial.	6
III	**ManagementofNursery** 1. Seasonal activities and routine operations in a nursery. 2. Nurserymanagement-watering, weedingandnutrients: pestsanddiseases. 3. Commonpossibleerrorsinnurseryactivities. 4. Economicsofnurserydevelopment,pricing and recordmaintenance. 5.Onlinenurseryinformationandsalessystems.	6

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DEPARTMENT OF CHEMISTRY

HIGHLIGHTED SYLLABUS OF CHEMISTRY
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

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SEMESTER – I   **SUBJECT: CHEMISTRY**   **COURSE CODE:CHET11A**
PAPER TITLE : INORGANIC &PHYSICAL CHEMISTRY,   PAPER–I   **ACADEMIC YEAR-2021-2022**

60 hrs(4h/w)   **Credits-3**

INORGANIC CHEMISTRY   **24h**

UNIT – I

1. Chemistry of p-block elements   **8h**

Group 13: Preparation & structure of Diborane, Borazine

Group 14: Preparation, classification and uses of silicones

Group 15: Preparation & structures of Phosphonitrilic halides {$(PNCl2)n$where n=3, 4

Group 16: Oxides and Oxoacids of Sulphur (structures only)

Group 17: Pseudo halogens, Structures of Interhalogen compounds.

UNIT-II

1. Chemistry of d-block elements: **6h**

Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states.

2. Chemistry of f-block elements: 6h

Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides.

3. Theories of bonding in metals: 4h

Valence bond theory and free electron theory, explanation of thermal and electrical conductivity of metals based on these theories, Band theory- formation of bands, explanation of conductors, semiconductors and insulators.

PHYSICAL CHEMISTRY 36h

UNIT-III

Solid state 10h

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Miller indices, Definition of lattice point, space lattice, unit cell. Bravais lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. Powder method. Defects in crystals. Stoichiometric and non-stoichiometric defects.

UNIT-IV

1. Gaseous state 6h

Van der Waal's equation of state. Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. Relationship between critical constants and vander Waal's constants. Law of corresponding states. Joule- Thomson effect. Inversion temperature.

2. Liquid state 4h

Liquid crystals, mesomorphicstate. Differences between liquid crystal and solid/liquid. Classification of liquid crystals into Smectic and Nematic. Application of liquid crystals as LCD devices.

UNIT-V

Solutions, Ionic equilibrium& dilute solutions

1. Solutions 6h

Azeotropes-HCl-H_2O system and ethanol-water system. Partially miscible liquids-phenol- water system. Critical solution temperature (CST), Effect of impurity on consulate temperature. Immiscible liquids and steam distillation. Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.

2. Ionic equilibrium   **3h**

Ionic product, common ion effect, solubility and solubility product. Calculations based on solubility product.

3. Dilute solutions   **7h**

Colligative properties- RLVP, Osmotic pressure, Elevation in boing point and depression in freezing point. Experimental methods for the determination of molar mass of a non-volatile. Solute using osmotic pressure, Elevation in boing point and depression in freezing point. Abnormal colligative properties. Van't Hoff factor.

Co-curricular activities and Assessment Methods

1. Continuous Evaluation: Monitoring the progress of student's learning.

2. Class Tests, Work sheets and Quizzes.

3. Presentations, Projects and Assignments and Group Discussions: Enhances critical thinking skills and personality.

4. Semester end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.

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PRACTICAL SYLLABUS

Practical Paper – I Analysis of SALTMIXTURE	PAPER CODE : CHEP11A ACADEMIC YEAR-2021-2022

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

Practical-I   (At end of Semester-I)

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

Course outcomes:

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

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

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

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

Analysis of SALT MIXTURE   **50 M**

Analysis of mixture salt containing two anions and two cations (From two different groups) from the following:

Anions: Carbonate, Sulphate, Chloride, Bromide, Acetate, Nitrate, Borate, Phosphate.

Cations: Lead, Copper, Iron, Aluminium, Zinc, Nickel, Manganese, Calcium, Strontium, Barium, Potassium and Ammonium.

SEMESTER – III	SUBJECT: CHEMISTRY	COURSE CODE: CHE-301C

PAPER TITLE : ORGANIC CHEMISTRY & SPECTROSCOPY, PAPER–III

ACADEMIC YEAR-2021-2022

60 hrs(4h/w)   **Credits-3**

ORGANIC CHEMISTRY

UNIT – I

1. Chemistry of Halogenated Hydrocarbons: **6h**

Nomenclature, any two preparations of Alkyl halides, Aryl halides,

Chemical properties   **Marks Weightage-5**

a. Williamson's synthesis b. substitution vs elimination.

c. Relative reactivity of alkyl, allyl, vinyl, benzyl and aryl halides towards nucleophilic substitution reactions.

Mechanisms   **(Marks Weightage-10)**

SN^1, SN^2, and SN^i Nucleophilic substitution reactions with stereo chemical aspects and effect of solvent.

2. Chemistry of Alcohols &Phenols   **6h**

Nomenclature, any two preparations of Alcohols & Phenols

Chemical properties   **(Marks Weightage-5)**

a**.** Acidity of phenols and factors affecting it b. Ring substitution reactions (Bromination, Nitration) c. Fries rearrangements d. Kolbe's–Schmidt Reactions, e. Oxidation of diols by periodic acid and lead tetra acetate,

Mechanisms   **(Marks Weightage-10)**

Reimer–Tieman reaction, Claisen rearrangements, and Pinacol-Pinacolone rearrangement.

UNIT-II

Carbonyl Compounds   **6h**

Nomenclature, any two preparations of (Carbonyl Compounds) Aldehyde and ketones.

Chemical properties   **Marks Weightage-5**

A. Nucleophilic addition reactions of A. $NaHSO_3$, HCN, RMgx B. Nucleophilic addition reactions with ammonia derivatives, C. Wittig Reaction, Halo form Reaction, Beckmann rearrangements, Michael-addition, Benzoin condensation, Perkin Reaction. and Reformatsky reactions. Reduction reactions: Clemmenson, wolf-kishner, $LiAlH_4$ and $NaBH_4$.

Mechanisms   **(Marks Weightage-10)**

Aldol condensation, Cannizzaro Reaction, Baeyer-Villiger oxidation.

UNIT-III

Carboxylic Acids and their Derivatives   **16h**

Nomenclature, any two preparations of Carboxylic Acids, and their derivatives**.**

Chemical properties   **(Marks Weightage-5)**

A. Reactions involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation, amide formation and esterification,

B. Huns-Diecker reaction, Schimdt reaction, Curtius rearrangement, Arndt-Eistert synthesis, C. Typical Reactions of dicarboxylic acids, hydroxy acids and unsaturated acids. Reactions of acid chlorides, anhydrides, esters and amides.

Mechanisms   **(Marks Weightage-10)**

Mechanism of acidic and alkaline hydrolysis of esters, Hell-Volhard- Zelinsky.

Active methylene compounds   **(Marks Weightage-10+5)**

Acetoacetic esters: keto-enol tautomerism, preparation by Claisen condensation (mechanism), Acid hydrolysis and ketonic hydrolysis. Synthetic applications:Preparation of a) monocarboxylic acids (Acetic acid, Propanoic acid) b) Dicarboxylic acids (Succinic acid, Adipic acid).

C) Reaction with urea.

Malonic ester: preparation from acetic acid.

Synthetic applications: Preparation of a) monocarboxylic acids (Acetic acid, Propanoic acid)

 b) Dicarboxylic acids (succinic acid and adipic acid) C.Reaction with urea**.**

SPECTROSCOPY

UNIT-IV

Spectrophotometry   **6h**   **(Marks Weightage-5+5)**

General feature of absorption-Beer-Lambert's law and its application, transmittance Absorbance, and molecular absorptivity. Single and double beam Spectrophotometers. Applications of Beer-Lambert's for Quantitative analysis of 1. Chromium in $K_2Cr_2O_7$ 2. Manganese in Manganous sulphate.

Electronic spectroscopy: **6h**   **(Marks Weightage-10)**

Interactions of electromagnetic radiations with molecules and types of molecular spectra. Energy levels of molecular orbital (σ, π, n). Selection rules for electronic spectra. Types of electronic transitions in molecules, effect of conjugation. Concept of chromophore and auxochrome.

Nuclear Magnetic Resonance (NMR) spectroscopy: **6h**   **(Marks Weightage-10+5)**

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.

UNIT-V   **8h**

Application of Spectroscopy to Simple Organic Molecules   **(Marks Weightage-10)**

Application of visible, ultraviolet and infrared spectroscopy in organic molecules.

Application of electronic spectroscopy and Wood ward 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 intra molecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on >C=O stretching absorptions).

PRACTICAL SYLLABUS

Practical Paper – III	PAPER CODE : CHE-301 P
Organic preparations and IR Spectral Analysis	ACADEMIC YEAR-2021-2022

30 hrs (2 h/W)   Credits: 2

Organic preparations:

 i. Acetylation of one of the following compounds: amines (aniline, o-, m-, p-toluidines 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).

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

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SEMESTER – V	**SUBJECT: CHEMISTRY**	**COURSE CODE: CHE-501C**

PAPER TITLE : INORGANIC,ORGANIC & PHYSICAL CHEMISTRY, Paper –V

ACADEMIC YEAR-2021-2022

INORGANIC CHEMISTRY   **60 hrs(4h/w) Credits-3**

UNIT – I

Coordination Chemistry: (10+10+5)   **12h**

IUPAC nomenclature - bonding theories - Review of Werner's theory and Sidg-wick's Concept of coordination - Valence bond theory - geometries of coordination numbers 4-tetrahedral and square planar and 6-octahedral and its limitations, crystal filed theory - Splitting of d-orbitals in octahedral, tetrahedral and square-planar complexes - low spin and high spin complexes - factors affecting crystal-field splitting energy, merits and demerits of crystal-field theory. Isomerism in coordination compounds – structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers

UNIT-II

1. Magnetic properties of metal complexes: (10+5)   **5h**

Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility-Gouy method.

2. Stability of metal complexes: (10+5)   **6h**

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.

ORGANIC CHEMISTRY

UNIT- III

Nitro hydrocarbons: (10+5)   **5h**

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.

UNIT – IV

Nitrogen compounds: (10+10+5)   16h

Amines (Aliphatic and Aromatic): Nomenclature, Classification into 1°, 2°, 3° Amines and Quaternary ammonium compounds. Preparative methods – 1.Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromide reaction (mechanism). Reduction of Amides and Schmidt reaction. Physical properties and basic character - Comparative basic strength of Ammonia, methyl amine, dimethyl amine, tri methyl amine and aniline - comparative basic strength of aniline, N-methyl aniline and N,N-dimethyl aniline (in aqueous and non-aqueous medium), steric effects and substituent effects.

Chemical properties: a) Alkylation b) Acylation c) Carbylamines reaction d) Hinsberg separation e) Reaction with Nitrous acid of 1°, 2°, 3° (Aliphatic and aromatic amines). Electrophilic substitution of Aromatic amines – Bromination and Nitration. Oxidation of aryl and Tertiary amines, Diazotization.

PHYSICAL CHEMISTRY

UNIT- V

Thermodynamics   (10+5+5)   16h

The first law of thermodynamics-statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule-Thomson effect- coefficient. Calculation of w, for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes. State function. Temperature dependence of enthalpy of formation-Kirchhoff's equation. Second law of thermodynamics. Different Statements of the law. Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes.

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PRACTICAL SYLLABUS

Practical Paper – V Organic Qualitative Analysis	PAPER CODE : CHE-501 P ACADEMIC YEAR-2021-2022

                                                        30 hrs (2 h/W)   Credits: 2

Organic Qualitative Analysis: **50M**

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

Alcohols, Phenols, Aldehydes, Ketones, Carbohydrates, Carboxylic acids, Aromatic Primary Amines.

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SEMESTER – V   Paper – VI   SUBJECT: CHEMISTRY   PAPER CODE: CHE-502C

PAPER TITLE : INORGANIC,ORGANIC & PHYSICAL CHEMISTRY

ACADEMIC YEAR-2021-2022

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60 hrs (4h/w)   Credits-3

INORGANIC CHEMISTRY

UNIT-I

1. Reactivity of metal complexes: (10+5)   5h

Labile and inert complexes, ligand substitution reactions - SN^1 and SN^2, substitution reactions of square planar complexes - Trans effect and applications of Trans effect.

2.Bio inorganic chemistry: (10)   5h

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and Cl. Metallo porphyrins – Structure and functions of hemoglobin, Myoglobin and Chlorophyll.

ORGANIC CHEMISTRY

UNIT- II

Heterocyclic Compounds (10+5)   10h

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 - electrophilic 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.

UNIT-III

Carbohydrates   (10+5+5+5)   **12h**

Monosaccharide's: Glucose (aldo hexose) - Evidence for cyclic structure of glucose (some negative aldehydes tests and mutarotation) - Proof for the ring size (methylation, hydrolysis and oxidation reactions) - Pyranose structure (Haworth formula and chair conformational formula).

Fructose (ketohexose) - Evidence of 2 - ketohexose structure (formation of pent acetate, formation of cyanohydrin its hydrolysis and reduction by HI). Cyclic structure for fructose (Furanose structure and Haworth formula) - osazone formation from glucose and fructose – Definition of anomers with examples.

Interconversion of Monosaccharide's: Aldopentose to Aldohexose (Arabinose to D- Glucose, D-Mannose) (Kiliani - Fischer method). Epimers, Epimerisation - Lobry de bruyn van Ekenstein rearrangement. Aldohexose to Aldopentose (D-Glucose to D- Arabinose) by Ruff degradation. Aldohexose to Ketohexose [(+) Glucose to (-) Fructose] and Ketohexose to Aldohexose (Fructose to Glucose)

UNIT- IV

Amino acids and proteins   (10+10+5)   **12h**

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) Malonic ester synthesis c) 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-lactums from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.

Mass Spectrometry: (10M)   **6h**

Basic principles-Molecular ion/parent ion, fragement ions/daughter ions. Theory-formation of parent ions. Representation of mass spectrum. Identification of parent ion, $(M+1),(M+2)$, base

peaks(relative abundance 100%) Determination of molecular formula-mass spectra of ethyl benzene, acetophenone,1-propanol.

PHYSICAL CHEMISTRY

UNIT-V

1. Chemical kinetics   (10+5)   10h

Rate of reaction - Definition of order and molecularity. Derivation of rate constants for first, second, third and zero order reactions and examples. Derivation for time half change. Methods to determine the order of reactions. Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy.

PRACTICAL SYLLABUS

Practical Paper –VI Physical Chemistry	COURSE CODE : CHE-502 P ACADEMIC YEAR-2021-2022

30 hrs (2 h/W)   Credits: 2

1. Determination of rate constant for acid catalyzed ester hydrolysis.
2. Determination of molecular status and partition coefficient of benzoic acid in Benzene and water.
3. Determination of Surface tension of liquid
4. Determination of Viscosity of liquid.
5. Adsorption of oxalic acid on silica gel, verification of Freundlisch isotherm.

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Title of the Paper: ORGANIC AND GENERALCHEMISTRY

Course Code: CHET21A   Semester: II

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	**12h**

	andnucleophilicadditions,hydrationtoformcarbonyl compounds,Alkylationof terminalalkynes.	
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) **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)	12h
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 (N2, O2, CO and NO). **3. HSAB** **4.5** Pearson's concept, HSAB principle & its importance, bonding in	14h

	Hard-Hard and Soft-Soft combinations.		
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	

Co-curricular activities and Assessment Methods

Continuous Evaluation: Monitoring the progress of student's learning

Class Tests, Worksheets and Quizzes

Presentations, Projects and Assignments and Group Discussions: Enhances critical thinking skillsand personality

Semester-end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.

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PRACTICAL SYLLABUS.

Practical Paper – II Volumetric Analysis	PAPER CODE : CHE-401 C ACADEMIC YEAR-2021-2022

Title of the Paper: INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY

Semester: IV

Course Details

Unit	Learning Units	Lecture Hours
	INORGANIC CHEMISTRY	
I	**Organometallic Compounds (Marks weightage 10+5)** Definition and classification of organometallic Compounds on the basis of bond type, Concept of hapticityof organic ligands. Metal carbonyls: 18electronrule,electron count of mononuclear, poly nuclear and substituted metal carbonylsof Fe, Ni, Co.	**8h**
	ORGANIC CHEMISTRY	
II	**Carbohydrates (Marks weightage 10)** Occurrence,classification,Monosaccharides: Constitutionand absolute configurationofglucoseandfructose,epimersandanomers,mutarotation,determinationofring sizeof glucose andfructose,Haworthprojectionsandconformationalstructures; **Interconversions(Marks weightage 5)** 1. Aldopentose to Aldohexose (Killiani-Fischer synthesis)2. Aldohexose to Aldopentose (Ruff degradation).3. Aldohexose to ketohexose 4. Ketohexose to Aldohexose	**8h**
III	**1. Amino acidsandproteins(Marks weightage 10)** 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	**6h**

	halogenated carboxylic acid b) from malonic ester synthesis c) strecker's synthesis. Physical properties: **(Marks weightage 5)** Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point. Chemical properties: **(Marks weightage 5)** 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 (Marks weightage 10)** 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(Marks weightage 5)** Pyridine – Structure - Basicity - Aromaticity- Comparison with pyrrole- one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction	**7h**
IV	**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), **Reactions (Marks weightage 10)** Nef reaction and Mannich reaction leading to Micheal addition and reduction. **2. Amines (Marks weightage 10 +5)** 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 nitrous acid. Discussion of the following reactions; (Not required mechanism) Gabriel Phthalimide synthesis, Hoffmann-Bromamide reaction, Carbylamine reaction.	**3h** **11h**

	Diazonium Salts: Synthetic applications of diazonium salts including preparation of arenes, haloarenes, Coupling reactions of diazonium salts (preparationofazo dyes).		
V	**1.Photochemistry** (Marks weightage 10+5) 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). **2. Thermodynamics(Marks weightage 10+5)** 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.	**5h** **12h**	

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PRACTICAL SYLLABUS.

Practical Paper – IV OrganicQualitativeanalysis	PAPER CODE : CHE-401 P ACADEMIC YEAR-2021-2022

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.

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Title of the Paper: INORGANIC&PHYSICALCHEMISTRY

Course Code:CHE-402C

Semester: IV

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
	INORGANIC CHEMISTRY	**26h**
I	**Coordination Chemistry (Marks weightage 10+10+5)** 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,	**12h**
II	**1. Inorganic Reaction Mechanism (Marks weightage 10+5)** 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	**4h**
	2. Stability ofmetalcomplexes (Marks weightage 10+5) 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.	**8h**
	3. Bioinorganic Chemistry (Marks weightage 5+5) Metal ions present in biological systems, Importance of sodium, potassium and magnesium. Structure and functions of Hemoglobin.	**2h**

	PHYSICALCHEMISTRY	34h	
III	**1 .Phase rule (Marks weightage 10+5)** Concept of phase, components, degrees of freedom. Phase diagram of one component system - water system, Study of Phase diagrams of Simple eutectic systems i) Pb-Ag system, desilverisation of lead Definition and examples for systems having congruent and incongruent melting point , freezing mixtures.	**6h**
IV	**Electrochemistry** **(Marks weightage 10+5)** 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.	**14h**
V	**Chemical Kinetics:** **(Marks weightage 10+10+5)** 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 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.	**14h**

Practical Paper – V Conductometric andPotentiometric Titrimetry	**PAPER CODE : CHE-402P** **ACADEMIC YEAR-2021-2022**

30 hrs (2 h/W)   Credits: 2

Practical-Course –V Conductometric andPotentiometric Titrimetry   50 M

Course outcomes:

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

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

2. Apply concepts of electrochemistry inexperiments

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

Conductometric andPotentiometricTitrimetry   50 M

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

2. Conductometric titration- Determination of concentration of CH_3COOH Solution using standard NaOHsolution.

3. Conductometric titration- Determination of concentration of CH_3COOH 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

Title of the Paper: ANALYTICAL METHODS IN CHEMISTRY

Course Code:CHE-601GE

Semester: VI

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Syllabus

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Course Details

Unit	Learning Units	Lecture Hours
I	**Quantitative analysis: (Marks weightage 10+5)** Methods of different types of chemical analysis**,** Principle of volumetric analysis. Theories of acid-base, redox, complexometric, iodometric and precipitation titrations - choice of indicators for these titrations.	**15h**
II	**Treatment of analytical data**: (**Marks weightage** 10+5) Types of errors, significant figures and its importance, accuracy - methods of expressing accuracy, error analysis and minimization of errors, precision - methods of expressing precision, standard deviation and confidence limit.	**8h**
III	**Separation Techniques in Chemical analysis** **(Marks weightage 10+10+5)** **Solvent extraction**: Introduction, principle, techniques, factors affecting solvent Extraction, Batch extraction, continuous extraction. Synergism. Application - Determination of Iron (III), organic mixture analysis.	**15h**
IV	**Chromatography (Marks weightage 10+10+5+5)** Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, Rf values, factors effecting Rf values. **Ion exchange Chromatography**: Introduction, action of ion exchange	**12h**

	resins, separation of inorganic mixtures, applications.	
	Paper Chromatography : Principle, experimental procedures, choice of paper and solvent systems, developments of chromatogram - ascending, descending and radial. Two dimensional chromatography, applications.	
V	**Thin layer Chromatography (TLC)**: **(Marks weightage 10+10+5+5)** Principles, Experimental procedures. Adsorbents and solvents. Preparation of plates. Development of the chromatogram. Detection of the spots. Applications. **Column Chromatography**: Principles, experimental procedures, Stationary and mobile Phases, Separation technique. Applications.**GC**: Principle and applications,**HPLC**: Basic principle and applications.	**10h**

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PRACTICAL SYLLABUS

Practical Paper – I Analysis of SALTMIXTURE	PAPER CODE : CHE-601GE ACADEMIC YEAR-2021-2022

1. Identification of amino acids by paper chromatography.

2. Determination of Zn using EDTA

3. Determination of Mg using EDTA

4. Hardness of water.

Title of the Paper: ORGANIC SPECTROSCOPIC TECHNIQUES

Course Code:CHE-602CE

Semester: VI

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY** **(Marks weightage 10+10+5)** Nuclear spin, Principles of NMR-Classical and Quantum Mechanical methods, Larmour Frequency. Instrumentation. Saturation, Relaxation spin-spin & spin lattice relaxation. Chemical shifts -Factors influencing Chemical shift, Shielding and De-shielding mechanism.	**15h**
II	**NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY** **(Marks weightage 10+5)** Spin-Spin interactions-factors affecting spin-spin interactions, Deuterium exchange (H^+) Coupling constant- types of coupling constant-vicinal, Geminal and long range coupling constant- Factors influencing coupling constants. Types of PMR Spectrums –AX, AX_2 and AB type with one example.	**8h**
III	**Electron Spin Resonance Spectroscopy** **(Marks weightage 10+10+5+5)** Basic Principles, Theory of ESR, Comparison of NMR &ESR.Instrumentation, Factors affecting the 'g' value, determination of 'g' value. Isotropic and Anisotropic constants. Splitting hyper fine splitting coupling constants. Line width, Zero field splitting and Kramer degeneracy. Crystal field splitting,Crystal field effects.Applications:- Detection of free radicals, ESR spectra of (a) H·- radical (b)Deuterium radical (c) Methyl radical(CH_3) (d) Benzene anion (C_6H_6) (e) $[Cu(H_2O)_6]^{+2}$	**14h**

IV	**UV & VISIBLE SPECTROSCOPY** **(Marks weightage 10+10+5+5)** Electronic spectra of diatomic molecules. The Born- oppenheimer approximation. Vibration coarse structure: Intensity of Vibrational-electronic spectra:The Franck-Condon principle.Electronicstructure of diatomic molecules. Types of transitions, Chromophores, Auxochrome, types of shifts in UV Visible spectrum, Conjugated dienes, trienes and polyenes, unsaturated carbonyl compounds-Woodward – Fieser rules.	**15h**
V	**Electronic spectra of polyatomic molecules** **(Marks weightage 10+5)** Chemical analysis by Electronic Spectroscopy – Beer-Lambert's Law. Deviation from Beer's law. Quantitative determination of metal ions (Mn^{+2}, Fe^{+2}). Simultaneous determination of Chromium and Manganese in a mixture.	**8h**

Title of the Paper: ADVANCED ORGANIC REACTIONS

Course Code:CHE-603CE

Semester: VI

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**ORGANIC PHOTOCHEMISTRY** **(Marks weightage 10+10+5)** Organic photochemistry: Molecular orbitals, carbonyl chromophore–Jablonski diagram, Photochemical reactions-Photo reduction-mechanism, example-aromatic compounds. Sensitizer and influence of sensitizer.	**10h**
II	**ORGANIC PHOTOCHEMISTRY** **(Marks weightage 10+10+5)** Norrisch cleavages, type -I: Mechanism, acyclic cyclic diones, Photo Fries rearrangement. Norrisch type II cleavage: Mechanism and stereochemistry, Type- II reactions of esters: 1: 2 diketones, photo decarboxylation, Di-π methane Rearrangement, Photochemistry – of conjugated dienes, Decomposition of nitrites –Barton reaction.	**12h**
III	**PROTECTING GROUPS AND ORGANIC REACTIONS** **(Marks weightage 10+10+5+5)** Principles of (1) Protection of alcohols – ether formation including silyl ethers – ester formation, (2) Protection of diols – acetal,ketal and carbonate formation, (3) Protection of carboxylic acids – ester formation, benzyl and t–butyl esters, (4) Protection of amines– acetylation, benzoylation, benzyloxy carbonyl, triphenyl methyl groups and fmoc, (5)Protection of carbonyl groups – acetal, ketal, 1,2–glycols and 1,2–dithioglycols formation.	**15h**
IV	**SYNTHETIC REACTIONS**: **(Marks weightage 10+5+5)** Mannich reaction – Mannich bases – Robinson annulations. The Shapiro reaction, Stork–enamine reaction. Use of dithioacetals – Umpolung, phase transfercatalysis – mechanisms and use of benzyl trialkyl ammonium halides. Witting reaction.	**8h**

V	**NEW SYNTHETIC REACTIONS** (Marks weightage 10+5) **Define with example and mechanism**- Suziki coupling, Click reaction,Baylis–Hillman reaction,RCMolefm metathesis, Mukayamaaldol reaction. **Define with one example**: (Mechanism not required**)** Mitsunobu reaction, McMurrey reaction, Julia–Lythgoeolefination, Stille coupling and Heck reaction.	**15h**

Title of the Paper: PHARMACEUTICAL AND MEDICINAL CHEMISTRY

Course Code: CHE-604CE

Semester: VI

Syllabus

Unit	Learning Units	Lecture Hours
I	**Pharmaceutical chemistry Terminology:** **(Marks weightage 10+5+5)** Pharmacy, Pharmacology, Pharmacophore,Pharmacodynamics,Pharmacokinetics (ADME, Receptors - brief treartment) Metabolites and Anti metabolites.	12h
II	**Drugs(Marks weightage 10+10+5)** Nomenclature: Chemical name, Generic name and trade names with 10-examplesClassification based on structures and therapeutic activity with one example each.	10h
III	**Synthesis and therapeutic activity of the compounds:** **Chemotheraputic Drugs(Marks weightage 10+10+5)** l.Sulphadrugs(Sulphamethoxazole) 2.Antibiotics - β-Lactam Antibiotics-Isolation ofPencilline by submerged culture method, 3. Anti malarial Drugs (chloroquine). **Psycho therapeutic Drugs**: **(Marks weightage 10+5)** 1.Antipyretics(Paracetamol)2.Hypnotics,Tranquilizers (Diazepam) 3.Levodopa.	18h
IV	**Pharmacodynamic Drugs: (Marks weightage 10+5)** 1.Antiasthma Drugs (Solbutamol) 2. Antianginals (Glycerol Trinitrate) 3.Diuretics (Frusemide)	8h
V	**HIV-AIDS:** **(Marks weightage 10+5)** Immunity - CD-4cells, CD-8cells, Retro virus, Replication in human body, Investigation available, prevention of AIDS, Drugs available - examples with structures: PIS: Indivanir (crixivan), Nelfinavir(Viracept).	12h

PRACTICAL SYLLABUS

Practical Paper – I	PAPER CODE : CHE-602CE
Preparations of Organic compounds	**ACADEMIC YEAR-2021-2022**

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

1. Preparation of Aspirin.
2. Preparation of Paracetamol.
3. Preparation of Acetanilide
4. Preparation of Barbutiric Acid.
5. Preparation of Phenyl Azo β-naphthol.

PRACTICAL SYLLABUS

Practical Paper – I	PAPER CODE : CHE-603CE
Preparations of Organic compounds by Green procedure	**ACADEMIC YEAR-2021-2022**

30 hrs (2h / W),   **Credits-2**

1. Green procedure for organic qualitative analysis: Detection of N, S and halogens

2. Acetylation of 1^0 amine by green method: Preparation of acetanilide

3. Rearrangement reaction in green conditions: Benzil-Benzilic acid rearrangement

4. Electrophilic aromatic substitution reaction: Nitration of phenol

5. Radical coupling reaction: Preparation of 1, 1-bis -2-naphthol

6. Green oxidation reaction: Synthesis of Adipic acid
7. Green procedure for Diels Alder reaction between furan and Maleic anhydride

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(AUTONOMOUS), VUYYURU.
(Accredited at "A" Grade by NAAC, Bangalore)
PRACTICAL SYLLABUS

Practical Paper – I	PAPER CODE : CHE-604CE
Project work	ACADEMIC YEAR-2021-2022

The students have chosen chemistry as cluster elective.

"*Spectral analysis of various shaded dried leaves powder extract with polar and non-polar solvents using IR and UV spectroscopies*" is selected as a project work to the students for this academic year.

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Title of the Paper: GENERAL CHEMISTRY
Semester:I
Course Code: 20CH1T1

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	**Introduction to Molecular Spectroscopy:** Motion of molecules-Degrees of freedom – Energy associates 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.	12
IV	**Rotational Vibrational Spectroscopy**: Harmonic oscillator, vibrational energies of diatomic molecules, zero-point energy, force constant and bond strengths, anharmonicity, Morse potential energy diagram. Vibration – rotation spectroscopy. PQR branches, Born–Openheimer approximation, selection rules, normal modes of vibration, group frequencies, overtones, hot bands,applications.	12
V	**Symmetry and Group theory in chemistry:** Symmetry elements, symmetry operation, definition of group, sub group, relation between order of a finite group and its sub group. GMT tables Abelian and non-abelian groups. Point group. Schonfiles symbols, Find out Point group of a molecule (yes or no Method). Representation of groups by Matrices (representation for the Cn, Cnv, Cnh, Dn etc. groups to be worked out, explicitly). Character of a representation. The great Orthogonality theorem (without proof) and its importance. Character tables and their use. Construction of Character tables.	12

Title of the Paper: INORGANIC CHEMISTRY-I
Semester:I
Course Code: 20CH1T2

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 (BeH2) molecules and ions (NO2$^-$) andenergy level diagrams. Walsh diagrams for linear (BeH2) and bent (H2O) 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 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

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Title of the Paper: ORGANIC CHEMISTRY-I
Semester: **I**
Course Code: 20CH1T3

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 andArynes. **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**: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 elimination, pyrolytic eliminations.	12
V	**Substitution Reactions:** **Aliphatic Nucleophilic substitutions:**The SN^2, SN^1, mixed SN^1 and SN^2 and SN^i reactions : Mechanism, effect of structure, nucleophile, leaving group on substitutions. The neighbouring group mechanism, participation by σ and π bonds, anchimeric assistance. **Aromatic Nucleophilic substitution:**TheSN^{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 Smilesrearrangements.	12

Title of the Paper: PHYSICAL CHEMISTRY-I
Semester:I
Course Code: 20CH1T4

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 Clapeyronequation - partial molar quantities - Chemical potential - Gibbs- Duhem equation - partial molar volume - determination of partial molar quantities - Fugacity - Determination of fugacity - Thermodynamic derivation of Raoult'slaw..	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 – Unimolecularreactions - 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 ofH_2 - Cl_2, Decomposition of acetaldehyde and ethane - Rice-Herzfeldmechanism.	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

Title of the Paper: Practical – I – Inorganic Chemistry (20CH1L1)
Semester: I
 Course Code:

List of experiments:

1. Preparation of Potassium trisoxalato ferrate(III).

2. Preparation of Tris thiourea copper (1)sulphate.

3. Preparation of Cis and trans potassium diaquodioxalato chromate(III).

4. Preparation of Hexa ammine cobalt (III)chloride.

5. Determinationof Zn^{2+} withpotassiumferrocyanide.

6. Determinationof Mg^{2+} usingEDTA.

7. Determinationof Ni^{2+} usingEDTA.

8. Determination of hardness of water usingEDTA.

9. Gravimetric determination of nickel using dimethylglyoxime.

10. Gravimetric determination of Zn using diammonium hydrogenphosphate.

11. Semi micro qualitative analysis of six radicalmixtures

(One interfering anion and one less familiar cation for each mixture)

(minimum three mixtures).

Anions: S^{2-} , SO^{2-} , Cl^-, Br^-, I^- , NO^- , SO^{2-}, $CH COO^-$, $C O^{-2}$, $C H O^{-2}$, PO^{3-}, CrO^{2-}, BO^{3-}

Cations: Ammonium (NH^+)

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^+.

Title of the Paper: Organic Chemistry ()

Semester:I
Course Code: 20CH1L2

List of experiments:

1. Separation of Binary mixtures of Carboxylic acid + Neutral organic compounds (Solvent extractionmethod).

2. Separation of Binary mixtures of Basic nature + Neutral organic compounds (Solvent Extractionmethod).

3. Separation of Binary mixtures of Phenolic compounds + Neutral organic compounds (Solvent extractionmethod).

4. Preparation of Phthalimide from Phthalic anhydride – HighTemperature.

5. Preparation of p-nitro acetanilide – Lowtemperature.

6. Preparation of Iodoform – Roomtemperature.

7. Paper chromatography - separate the given mixture ofsugars.

8. Paper chromatography - separate the given mixture of aminoacids.

9. Thin layer chromatography - separate the given mixture ofphenols

10. Thin layer chromatography - separate the given mixture of 2,4-DNP derivatives of carbonyls compounds.

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, SeO2, MnO2, Ag2CO3, Oppenauer oxidation, perhydroxylation using KMnO4, OsO4, HIO4, 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, LiAlH4, NaBH4, 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
Semester:III
Course Code: 20CH3T3A

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

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Title of the Paper: CHEMISTRY OF NATURAL PRODUCTS

Semester:III

Course Code: 20CH3T4B

Syllabus

Course Details

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

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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

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

II SEMESTER

Paper Code & Title :ORGANIC SPECTROSCOPY

Course Code: 20CH2T1

UNIT- I

UV- Visible Spectroscopy:

Mechanics of measurement – Energy transitions – Simple chromophores – Auxochrome, Absorption shifts (Bathochromic shifts, Hypsocromic shift, Hyper chromic shift, Hypo chromic shift). UV absorption of Alkenes – polyenes, unsaturated cyclic systems .

UV absorption of Carbonyl compounds α,β-unsaturated carbonyl systems - UV absorption aromatic systems – solvent effects – geometrical isomerism – acid and base effects – typical examples – calculation of λmax values for simple molecules using Woodward -Fieser rule

UNIT – II

IR Spectroscopy:

Mechanics of measurement – Fundamental modes of vibrations -Stretching and bending vibrations – Factors effecting vibrational frequency-hydrogen bonding.

Finger print region and its importance. Typical group frequencies for – CH,

OH, -NH, -CC, -CO and aromatic systems - Application in structural determination Examples – simple problems.

UNIT – III

Nuclear Magnetic Resonance Spectroscopy (1HNMR – First Order PMR):

Introduction: Nuclear spin-Basic principle of -NMR - nuclear resonance –saturation-Larmor's frequency-Relaxation- Instrumentation(Cw and FT) shielding and de shielding of magnetic nuclei- chemical shift and its measurements, factors influencing chemical shift, spin–spin interactions and factors influencing spin -spin coupling- Dynamic NMR- coupling constant J. and factors effecting J value.

UNIT – IV

Mass Spectrometry I

Introduction- ionization methods-EI, CI, ES, MALDI and FAB – advantages and disadvantages-molecular ion peak and its importance, meta stable peak, Nitrogen rule and extension of nitrogen rule. Determination of Molecular weight and determination of molecular formulae- Isotopic Peaks- Identification of single chlorine atom and double chlorine atom single bromine atom and double bromine atoms in organic compounds. Instrumentation.

UNIT – V

Mass Spectrometry II

Fundamental fragmentation process- Stevenson's rule- radical site initiated cleavage-charge site initiated cleavage-two bond cleavage- Retrodielalder cleavage- Mc-Lafferty rearrangement and other cleavages. Mass spectral fragmentation of alkanes, cycloalkanes, alkenes, alkynes, aromatic hydrocarbons, alcohols, phenols, thiols, ethers, carbonyl containing compounds (Aldehydes, ketones, esters and carboxylic acids), nitrogen compounds, alkyl chlorides and alkyl bromides, Examples of mass spectral fragmentation of organic compounds with respect to their structure determination.

M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)

II SEMESTER

Paper Code & Title: INORGANIC CHEMISTRY-II

Course Code: 20CH2T2

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 B12icosahedra). Carboranes,metalloboranes, metallocarboranes. Classification- LNCs and HNCs,Isoelectronic and Isolobal relationships, electron counting rules: Wade's and Lauher's rules. M-Mmultiple 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 countingrules, 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 andelimination. 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 infavour of CB mechanism. Anation reactions. Reactions without metal-ligand bond cleavage. Factors affecting the substitution reactions in octahedral complexes. Trans effect on substitution reactions insquare 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:

Termm symbols and their derivation, Microstates, Hund's rules to predict ground terms and ground states. List of groundenergy 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 Paramagnetism, anomalous magnetic moments - Orbital and spin contribution, spin-orbit coupling andmagnetic moments chiro optical properties, cotton effect and Faraday effect.

M.Sc – CHEMISTRY (ORGANIC CHEMISTRY)

II SEMESTER

Paper Code & Title:ORGANIC CHEMISTRY -II

Course Code: 20CH2T3

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 ringannulation 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 & Phase transfer catalysis:

Introduction to Green chemistry, Principles and concepts of Green chemistry, Green Catalysis, Bio catalysis, 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 Nano materials:

Introduction, carbon nanotubes: structure of single and multi-walled carbon nano tubes, 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 application

II SEMESTER

Paper Code & Title: 20CH2T4: PHYSICAL CHEMISTRY-II

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 partitionfunction - 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 ofpolymerization -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 Ramaneffects, pure rotational, vibrational and Vibrational- rotational Raman spectra, selection rules,

mutual exclusion principle.

Unit-III: Electro Chemistry-II:

Reference electrode - Standard hydrogen electrode. Calomelelectrode -Indicator electrodes: Metal-metal ion electrodes - Inert electrodes -Membrane electrodes- theory of glass membrane potential, potentiometric titrations, advantages of potentiometrictitrations, Conductometric titrations. Electrode potentials - Double layer at the interface - rate ofcharge 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 – Hydrogenoxygenreaction - lower and upper explosion limits - Fast reactions - Study of kinetics by flowmethods - Relaxation methods - Flash photolysis. Acid base catalysis –protolytic and prototropicmechanism. Enzyme catalysis - Michelis-Menten kinetics.

Photochemistry:

Quantum yield and itsdetermination, 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.

II SEMESTER

Paper Code & Title: CH206L1: ORGANIC CHEMISTRY PRACTICAL-II

List of experiments:

1. Preparation of organic compounds: Single stage preparations by reactions involvingnitration, halogenation, oxidation, reduction, alkylation, acylation, condensation andrearrangement.
(A student is expected to prepare at least 5 different organic compounds bymaking 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)

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

II SEMESTER

Paper Code & Title: 20OECH: (OPEN ELECTIVE-I)

CHEMISTRY IN DAILY LIFE

Unit-I: Chemistry Laboratory safety symbols – Meaning:

Corrosive, carcinogenic, Harmful, toxic, dangerous to environment, Explosive, flammable, Narcotic, Oxidizing, Lachrymatory, Radioactive, irritant, gases under pressure, general laboratory safety precautions.

Unit-II: Environmental Chemistry:

Ambient air quality standards, Acid rain, Smog, Greenhouse effect, Bhopal gas tragedy, Vishakhapatnam polymer industry tragedy, Renewable and Nonrenewable energy resources, DO, COD, BOD, Toxicity of lead, mercury, arsenic and Cadmium.

Unit-III: Bioinorganic Chemistry:

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Metalloporphyrin – Structure and functions of hemoglobin, Myoglobin.

Unit-IV: Biological functions of Hormones:

Introduction,Types of harmones, Role of Anderstrone, Progestrone and thyroxin, action of cortisone, Insulin.

Unit-V: Medicinal Chemistry:

The role of vitamins – K,E,D,C,B – complex, classification of antibiotics, mechanism of antibiotics action - role of ampicillin, chloromycetin and amoxicillin as antibiotics.

Text books/ Reference books:

1. Laboratory safety for Chemistry Students by Robert H. Hill and David Finster
2. A Text book of Environmental chemistry by W. Moore and F.A. Moore
3. Environmental Chemistry by Samir K. Banerji
4. Organic Chemistry by G. Mare Loudan, Purdue University
5. Unified Chemistry by O.P. Agarwal, Paper-III, JPNP Publications.
6. Hormones and Endocrine system – Kleine, Rossemanith.

A. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE(Autonomous)

II SEMESTER

Paper Code & Title: CH207L2: PHYSICAL CHEMISTRY PRACTIAL

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.

MOOCS – ORGANIC CHEMISTRY – I

Course Code: 20CH4T1

UNIT-I

Stereo Chemistry: 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-II

Conformational Analysis and ORD, CD Curves:

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.

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.

UNIT-III

Nature of bonding and Aromaticity: 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.

Aromatic Nucleophilic substitution: The SNAr (Addition – Elimination), SN1(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.

UNIT-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.

UNIT- V

Reactive intermediates, Reactive Species, Linear free energy relations: 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.

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.

20CH4T2A: HETERO CYCLIC 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.

20CH4T2 B: GREEN CHEMISTRY

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.

20CH4T3 A: TECHNIQUES FOR MODERN INDUSTRIAL APPLICATIONS

S.No	COURSE :TECHNIQUES FOR MODERN INDUSTRIAL APPLICATIONS COURSE OUTCOMES:	PO`S
	The student will be able to	
1	omprehend 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	xercise that how far the purification and chromatographic techniques e useful in assessing the purity of the compound.	1,3,7
4	aluate 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.

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.

SUGGESTED BOOKS:

1. Principles of Instrumental Analysis by D. A. Skoog, F. J. Holler and T. A. Nieman, Harcourt College Pub.

2. Separation Techniques by M. N. Sastri, Himalaya Publishing House (HPH), Mumbai.

3. Bio Physical Chemistry by A. Upadhyay, K. Upadhyay and N. Nath,(HPH) , Mumbai.

4. A Hand Book of Instrumental Techniques for Analytical Chemistry- Ed-F. A. Settle, Prearson Edn, Delhi.27

5. Introduction to Organic Laboratory Techniques-D. L. Pavia, G. M. Lampman,G. S. Kriz and R. G. Engel, Saunders College Pub (NY).

6. Instrumental methods of Chemical Analysis by B. K. Sharma, Goel Publish House, Meerut.

7. Instrumental methods of Chemical Analysis by H. Kaur, Pragati Prakasan, Meerut.

8. Protein Purification-Principles and practice, III Edn- R. K. Scopes, Narosa Publishing House , Delhi.

20CH4T3 B: NANO CHEMISTRY

S.No	COURSE OUTCOMES	PO`S
	Course: NANO CHEMISTRY	
	The student will be able to	
1	Will be able to memorize the basic concepts of nanochemistry and nano materials.	2,7
2	Understand the basic and advanced concepts of nanochemistry and nano materials	1,5,7
3	Apply the knowledge gained in the field of nanochemistry as and when required.	1,3,6
4	Analyse the role of nanochemistry in various interdisciplinary sciences.	1,5

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 Nano chemistry.

Unit-II

Synthesis of Nano materials: Top down and bottom- up approaches-synthesis of carbon Nano tubes, quantumdots, gold and silver nano particles.

Unit-III

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

Unit-IV

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

Unit-V

Nanochemistry in Nature: 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.

Textbooks/ Reference books:

1. Nano: The Essentials: Understanding Nanoscience and Nanotechnology, T.Pradeep, McGraw-Hill Professional Publishing,2008.

2. Introduction to Nanoscience, J.Dutta, H.F.Tibbals and G.L.Hornyak, CRCpress,

BocaRaton, 2008.

20CH4T4: ORGANO METALLIC REAGENTS

	Course: ORGANO METALLIC REAGENTS	
S.No	COURSE OUTCOMES	PO`S
	The student will be able to	
1	Memorize the synthetic roots and applications of organo metallic reagents.	2,7
2	Appreciate the methods of synthesis and reactivity of various organo metallic reagents	1,3,7
3	Investigate the conceptual knowledge in various organo metallic reagents in organic synthesis	1,6,3
4	Assess the role of specific organic reaction reagents in the synthesis	1,6,5

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

Referencebooks:

1. Organometallic in Synthesis AManualbyMSchlosser, L.Hegedus, B.Lipshutzetal, JohnWily&sons.

2. Modern methods of organic synthesis by W.Carruthers (Cambridge).

3. Organic synthesis by H.O.House.

4. Organo metallics: Aconcise introduction, ChristophElschenbroich, 3rdedition,Willey-VCH.

5. Advanced Organic Chemistry, F.ACarey and R.J.Sundberg.Plenum.

6. Transition metals in the synthesis of complex organic molecules, Hegedus, L.S,secondedition, University Science, Book ,CA,1999.

7. Organo metallic Chemistry and Catalysis, Astruc, D,Springer Verlag, 2007.

8. Organo transition metal chemistry: Applications to organic synthesis, Davies, S.G,Pergamon Press, NewYork, 1986.

add on Course in Chemistry (PG)

ORGANOMETALLIC CHEMISTRY & METAL MEDIATED ORGANIC SYNTHESIS

Overview

The course covers an advance level of organometallic chemistry and recent development of cross coupling reactions and their applications in organic synthesis,

Syllabus

UNIT – I

Introduction of Organometallic Chemistry, Ligand Substitution Reactions, Oxidative Addition [1.Concerted Mechanism], Oxidative Addition [2.SN2 Mechanism], Oxidative Addition[3.RadicalMechanism],Reductive Elimination, Insertion and elimination.

UNIT – II

Hydrogenation of Alkenes, Hydrosilation reaction, Hydroformylation reaction, Alkene dimerization, Alkene polymerization, Monsanto acetic acid process, Wacker process, Synthetic gasoline, Synthetic gas

UNIT - III

Asymmetric hydrogenation ,Kumada Coupling reaction ,Suzuki coupling reaction, Stille coupling reaction,Sonogashira coupling reaction, Heck coupling reaction

UNIT – IV

Metathesis of olefins and alkynes ,Buchwald-Hartwig coupling reaction ,Kulinkovich Reaction and its mechanism,Pauson–Khand reaction,Glaser coupling reaction,Nozaki-Hiyama-Kishi coupling reaction

Reference books:

1. Organometallic Chemistry – R C Mehrotra and A Singh, New Age Publications

2. Inorganic Chemistry- Principles of Structure and Reactivity, James E Huheey, Ellen A. Keiter, Richard L. Keiter, Pearson Education

3. Advanced Inorganic Chemistry- F A Cotton, G Wilkinson, Carlos A. Murillo, Manfred

Buchman- John Wiley and Sons.

4. Inorganic Chemistry – Allan G Sharpe, Addison Wesley

5. Organic Synthesis – Michael Bismuth (2nd Edition – McGraw Hill

6. Name Reactions – Jie Jack Li – (2nd Edition – Springer)

7. Organic Chemistry – Clayden, Greeves, Warren and Wothers (Oxford University Press)

8. Advanced Organic Chemistry – Francis A.Carey and Richard J.Sundberg   – Part B –
   Reactions and Synthesis. Kluwer Academic / Plenum Publishers.

9. Advanced Organic Chemistry – Francis A.Carey and Richard J.Sundberg   – Part A –
   Structure and Mechanisms – Kluwer Academic / Plenum Publishers.

CH4L1: ORGANIC ESTIMATIONS

S.No	COURSE OUTCOMES	PO`S
	The student will be able to	
1	Memorize the basic principles involved in organic quantitative analysis.	1,3,5
2	Understand the importance of organic quantitative analysis and their use on research and industry.	
3	Exercise the procedure of quantitative analysis in chosen job roles.	
4	Evaluate how far these methods are accurate in quantitative determinations.	

Course: ORGANIC ESTIMATIONS (20CH4L1)

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.

Part-III: Record Submission **10M**

20CH4L2: PROJECT WORK

	Project: PROJECT WORK (code 20CH4L2)	
S.No.	COURSE OUTCOMES	PO`S
	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.

➢ Isolation and characterization of Natural Products.

➢ Synthesis and characterization of Hetero Cyclic Compounds.

➢ Spectroscopical study of Organic compounds.

➢ Industrial visit and submit research findings of their Industrial visit / IIT's, CSIR Lab's, NIT's Central Universities etc.,

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" GradeISO 9001:2015 Certified Institution

DEPARTMENT OF COMPUTER SCIENCE

2021-22 (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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COMPUTER SCIENCE	CSC-501C	2021-'22	B.Sc.(MPCs, MCCs)

SEMESTER – V   **PAPER – V**   Max. Marks 70

Syllabus: **DATA BASE MANAGEMENT SYSTEMS**

NO of Hours: 4   **No Of Credits: 3**   **Pass Marks 28**

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

Unit – I: 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, Degree of Data Abstraction.

Unit - II: Relational Database & Data Modelling   **12 Hrs**
The Relational Database Model*: A logical view of Data, Keys, Integrity Rules, Relational Set Operators, The Data Dictionary and the system Catalog, Indexes, Codd's relational database rules
.Entity Relationship Model: The ER Model*Advanced Data Modelling:* The Extended Entity Relationship Model, Entity clustering, Entity integrity.

Unit-III: Normalization and Database Design   **14 Hrs**
Data base Tables and Normalization, The need Normalization, The Normalization Process, High level Normal Forms, Normalization and database design, de normalization.
Database Design: The Information System, The Systems Development Life Cycle, The Database Life Cycle, Centralized Vs Decentralized design.

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, Sub queries and correlated queries, SQL Functions.

Unit-V: Procedural SQL   **10Hrs**
Introduction to PL/SQL: Triggers, Stored Procedures, Pl/ SQL Stored Functions

Prescribed Text Book:
Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, Seventh Edition, Thomson (2007).

Reference Books:
Elimasri / Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Addison Wesley 2.
Raman A Mata – Toledo/Panline K Cushman, Database Management Systems, .
C.J.Date, Arkansan, S.Swamynathan, An Introduction to Database Systems, Eight edition,
"DatabaseSystemConcepts" by AbrahamSilberschatz, Henry Korth, and S.Sudarshan,
Atul Kahate, Introduction to Database Management Systems, Pearson Education (2006).
Student Activity: 1. Create your college database for placement purpose. 2. Create faculty database of your college with their academic performance scores

COMPUTER SCIENCE	CSC-501P	2021-'22	B.Sc.(MPCS,MCCs)
SEMESTER – V	**PAPER – V**		**Max. Marks 50**

Lab List	**DATA BASE MANAGEMENT SYSTEMS**		Pass Marks 25
No. of Hours per week: 2	**External: 25**	**Internal: 25**	**Credits: 2**

1. Creation of college database and establish relationships between tables
2. Explain various data type in Oracle.
3. Show the structure of the Emp table.
4. Show the structure of the DEPT table.
5. Explain the syntax of SELECT statement.
6. Create a query to display the name, job, hire date and employee number from emp table.
7. Create a query to display unique jobs from the emp table.
8. Create a query to display the empno as EMP#, ename as EMPLOYEE and Hire date from emp.
9. Create a query to display all the data from the EMP table. Separate each column by a comma and name the column THE_OUTPUT.
10. Create a query to display the name and salary of employees earning more than 2850.
11. Create a query to display the name and salary for all employees whose salary is not in the range of 1500 and 2850.
12. Display the employee name, job and start date of employees hired between February 20 ,1981 and May 1, 1981. Order the query in ascending order of start date
13. Display the employee name and department number of all the employees in departments 10 and 30 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 commission.
16. Display the name and job title of all employees who do not have a manager.
17. Display the name, job and salary for all employees whose job is Clerk or Analyst and their salary is not equal to 1000, 3000 or 5000.
18. Display the names of all employees where the third letter of their name is an 'A'.
19. Display the names of all employees who have two 'L's in their name and are in department 30 or their manager is 7782.
20. Display the name , salary and commission for all employees whose commission amount is grater than their salary increased by 10%.
21. Explain all the character functions.
22. Explain all the number functions.
23. Explain all the Date functions.
24. Explain different types of JOIN.
25. Write a query to display the name, department number and department name for all employees.
26. Create a unique listing of all jobs that are in department 30. and include the location of department 30 in the output.

27. Write a query to display the employee name, department name and location of all employees who earn a commission.

28. Write a query to display the name, job department number and department name for all employees who work in 'DALLAS'.

29. Create a query to display the name and hire date of any employee hired after employee BLAKE.

30. . Display all employees names and hire dates along with their manager's name and hire date for all employees who were hired before their managers.

31. Create your own users and give permissions to you and explain GRANT and REVOKE Commands.

A. Create MOVIE database using the following tables.

MOVIE:Movie no: primary key, varchar2Movie name: NOT NULL, varchar2Movie Type: varchar2Star: Varchar2

   CUSTOMER: Customer No: primary key, varchar2   Customer Name: NOT NULL, varchar2
   Address: NOT NULL   Phone no: Number   INVOICE: Invoice no: Varchar2, primary
key   Movie no: foreign key Customer no: foreign key
   Price: NOT NULL, Number

Queries:

1. List the movie names that starts with 'p'
2. List the number of the movies those price ranges from 15000 and 20000
3. List the customers who have phone numbers.
4. List the customers who have no phone numbers.
5. Display the following string
(a) A Customer "customer number" has bought the "movie number" "movie name" with "Price"
6. List the customers by calculating price as (price*tax)/100 where tax=0.5 and rename the column as 'tax'.
7. List the movies, which are owned by 2 customers.
8. List the customers, who bought 2 picture names.
9. List the customers, who are not the range of 15000 and 20000.

   B. Create Student database using the following tables.
   STUDENT: Sno : primary key, numberSname : NOT NULL, varchar2 Address: Varchar2
   COURSE:Sno : Foreign key.Course Name : varchar2
   Queries:
   1. Alter table by adding a column fees in table COURSE.
   2. Alter table by modifying the address to VARCHAR2(20)
   3. Create a view on which the students who joined in one course only.

   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.
6. Write A Procedure Update The Salary Of Employee, Who is Not Getting Commission by 10%.

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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COMPUTER SCIENCE	CSC-502C	2021-'22	B.Sc.(MPCs,MCCs)

SEMESTER – V	PAPER – VI	Max. Marks 70

Syllabus: **SOFTWARE ENGINEERING**

NO of Hours: 4   **No Of Credits: 3**   **Pass Marks 28**

Course Objectives
The Objective of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

UNIT-I: Introduction to Software Engineering & Process   **12Hrs**
The Evolving Role of Software– Software - The Changing Nature of Software, Software Myths, Legacy Software.
Process: Software Engineering-A Layered Technology - A Process Framework - The Capability Maturity Model Integration (CMMI) - Process Patterns, Process Assessments - Personal Software Process(PSP), Team Software Process (TSP).

Unit-II: Process Models
            12Hrs
The Waterfall Models - Increment Process Models: The Increment Model, The RAD Model - Evolutionary Process Models: Prototyping, The Spiral Model, The Concurrent Development Model.

Unit-III: Requirements Engineering   **14 Hrs**

Requirements Engineering Tasks - Initiating The Requirements Engineering Process - Eliciting Requirements: Collaborative Requirements Gathering, Quality Function Deployment, User Scenarios, Elicitation Work Products - Negotiating Requirements - Validating Requirements.

Unit-IV: Design Engineering   **10Hrs**
Design Process And Design Quality - Design Concepts - The Design Model: Data Design Elements, Architectural Design Elements, Interface Design Elements, Component-Level Design Elements, Deployment -Level Design Elements.

Unit-V:SoftwareQuality: **12Hrs**
Quality and Quality Concepts, Software Quality Assurance (SQA), Software Reviews, Formal Technical Reviews, Formal Approaches to SQA and SSQA, Software Reliability, The ISO 9000 Quality Standards, The SQA Plan.

Prescribed Text Book:

1. Software Engineering – A Practitioner's Approach, Sixth Edition - Roger S Pressman, TATA McGrawHill: Chapters: 1,2,3,7,8 and 9)
   Reference Books:
   1. Software Engineering Principles and Practice by Deepak Jain Oxford University Press
   2. Sommerville, "Software Engineering", Eighth Edition, Pearson Education, 2007
   Student Activity: Visit any financial organization nearby and prepare requirement analysis report
   2. Visit any industrial organization and prepare risk chart.

COMPUTER SCIENCE	CSC-502C	2021-'22	B.Sc.(MPCS,MCCs)

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

Lab List   **SOFTWARE ENGNEERING**   **Pass Marks 25**
No. of Hours per week: 2   **External: 25**   **Internal: 25**   **Credits: 2**

A. ATM

1. Objective of an ATM System. 2. Use-case Diagram of an ATM System 3. Class Diagram of an ATM System 4. Sequence Diagram of an ATM System 5. Activity Diagram of an ATM System 6.State Diagram of an ATM System 7. Deployment Diagram of an ATM System

B. Library management System

1. Objective of Library management System.2. Use-case Diagram of Library management
3. Class Diagram of Library management System4. Sequence Diagram of Library management 5. Activity Diagram of Library management System 6. State Diagram of Library management 7. Deployment Diagram of Library management System

C. Barcode Reader

1. Objective of Barcode Reader 2. Use-case Diagram of Barcode Reader 3. Class Diagram of Barcode Reader 4. Sequence Diagram of Barcode Reader 5. Activity Diagram of Barcode Reader 6. State Diagram of Barcode Reader 7. Deployment Diagram of Barcode Reader

D .Safe Home System

1. Objective of Safe Home System.2. Use-case Diagram of Safe Home System3. Class Diagram of Safe Home System4. Sequence Diagram of Safe Home System5. Activity Diagram of Safe Home System6. State Diagram of Safe Home System7. Deployment Diagram of Safe Home System

E. Online Book Store System

1. Objective of Online Book Store System   2. Use-case Diagram of Online Book Store System3. Class Diagram of Online Book Store System 4. Sequence Diagram of Online Book Store 5. Activity Diagram of Online Book Store System 6. State Diagram of Online Book Store System 7. Deployment Diagram of Online Book Store System

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COMPUTER SCIENCE	CCSC-505C	2021-22	B. Com (CA)

SEMESTER – V   **PAPER – V**   **Max. Marks 70**   **Pass Marks 28**

Syllabus   OBJECT ORIENTED PROGRAMMING USING JAVA

Total Hrs: 60   **NO. Of. Hours: 5**   **Credits: 3**

UNIT-I   **10Hrs**
Fundamentals of Object – Oriented Programming: Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP, Java features:

UNIT-II   **14Hrs**
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.**

UNIT-III   **12Hrs**
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.

UNIT-IV   **12 Hrs**
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;

UNIT-V   **12Hrs**
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;

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

COMPUTER SCIENCE	CCSC-505C	2021-22	B. Com (CA)

SEMESTER – V   **PAPER – V**

Lab List: **OBJECT ORIENTED PROGRAMMING USING JAVA** **Pass Marks 25**

No. of Hours per week: 2   **External: 25**   **Internal: 25**   **Credits: 2**

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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COMPUTER SCIENCE	CCSC 506C	2021-'22	B.Com.(C.A.)

SEMESTER – V   PAPER – VI   **Max. Marks 70**

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

NO Of Hours: 5   **No Of Credits: 3**   **Pass Marks 28**

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

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:

2Elimasri / Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Addison Wesley

3. C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, Eight edition, Pearson Education (2006).

Student Activity:

1. Create your college database for placement purpose.
2. Create faculty database of your college with their academic performance scores

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COMPUTER SCIENCE	CCSC-506P	2021-'22	B. COM(CA)

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

Lab List   DATA BASE MANAGEMENT SYSTEMS   Pass Marks 25

No. of Hours per week: 2   **External: 25**   **Internal: 25**   **Credits: 2**

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

Create Student database using the following tables.

STUDENT: Sno : primary key, numberSname : NOT NULL, varchar2 Address: Varchar2

COURSE:Sno   : Foreign key.Course Name : varchar2

Queries:

1. Alter table by adding a column fees in table COURSE.

2. Alter table by modifying the address to VARCHAR2(20)

3. Create a view on which the students who joined in one course only.

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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COMPUTER SCIENCE	CCSC-507C	2021-'22	B.Com.(CA)

SEMESTER – V   **PAPER – VII**   Max. Marks 70

Syllabus   WEB TECHNOLOGIES

 NO Of Hours: 5   **No of Credits: 3**   **Pass Marks 28**

Unit -I   Introduction to XHTML: **13Hrs**

Introduction to HTML, Basic html, Document body text, Hyperlinks, Lists, Tables, Images,

Frames, Forms and XHTML.

Unit- II: CSS: **12Hrs**

Cascading Style Sheets: Introduction, Defining your own styles, properties and values in styles,

Formatting blocks of information, Layers.

Java Script: java Script, the basics, Variables, String Manipulations, Mathematical functions,

Statements, Operators.

Unit –III: Objects in Java Script & Dynamic HTML with Java Script   **13Hrs**

Objects in Java Script: Data and objects in java script, Regular expressions, Exception Handling,

built in objects, Events.

Dynamic HTML with Java Script: Data validation, Rollover buttons, Moving images.

Unit –IV: XML Defining Data for Web Applications   **12Hrs**

XML: Introduction to XML, Basic XML, document type definition, XML Schema, Document

object model, Using XML parser.

Unit -V:JSP: **10Hrs**

JSP Lifecycle, Basic Syntax, EL (Expression Language), EL Syntax, Using EL Variables

Prescribed Books:

1.Chris Bates, Web Programming Building Internet Application, Second Edition, Wiley

     2.Head First Servlets and JSP 2nd Edition, Bryan Basham, Kathy Sierra

       3.Uttam Kumar Roy, Web Technologies from Oxford University Press

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COMPUTER SCIENCE	CSC-301C	2021-'22	B.Sc.(MPCs,MCCs)

SEMESTER –III   **PAPER – III**   **Max. Marks 70**

<u>**Model Paper**</u>:   **DATA BASE MANAGEMENT SYSTEMS**

NO of Hours: 4   **No Of Credits: 3**   **Pass Marks 28**

Course Objective:
The objective of the course is to introduce the design and development of databases with special emphasis on relational databases.

UNIT I   **12Hrs**
Overview of Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach.

UNIT II   **12Hrs**
Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, IS A relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modelling.

UNIT III   **12Hrs**
Relational Model: Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form.

UNIT IV   **12Hrs**
Structured Query Language: Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

UNIT V   **12Hrs**
PL/SQL: Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

BOOKS:
1. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill
2. Database Management Systems by Raghu Ramakrishnan, McGrawhill
3. Principles of Database Systems by J. D. Ullman
4. Fundamentals of Database Systems by R. Elmasri and S. Navathe
5. SQL: The Ultimate Beginners Guide by Steve Tale.

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. Practical assignments and laboratory reports,

4. Observation of practical skills,

5. Individual and group project reports like Create your college database for placement purpose.

6. Efficient delivery using seminar presentations,

7. Viva voce interviews.

8. Computerized adaptive testing, literature surveys and evaluations,

9. Peers and self-assessment, outputs form individual and collaborative work

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COMPUTER SCIENCE	CSC-301P	2021-'22	B.Sc.(MPCS,MCCs)

SEMESTER – III		**PAPER – III**	**Max. Marks 50**

Lab List   DATA BASE MANAGEMENT SYSTEMS   **Pass Marks 25**

No. of Hours per week: 2   **External: 25**   **Internal: 25**   **Credits: 2**

1. Draw ER diagram for hospital administration

2. Creation of college database and establish relationships between tables

3. Relational database schema of a company is given in the following figure.
Relational Database Schema - COMPANY
Questions to be performed on above schema
1. Create above tables with relevant *Primary Key, Foreign Key and other constraints*

2. Populate the tables with data

3. Display all the details of all employees working in the company.

4. Display *ssn, lname, fname, address* of employees who work in department no 7.

5. Retrieve the *Birthdate and Address* of the employee whose name is 'Franklin T. Wong'

6. Retrieve the name and salary of every employee

7. Retrieve all distinct salary values

8. Retrieve all employee names whose address is in 'Bellaire'

9. Retrieve all employees who were born during the 1950s

10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)

11. Retrieve the names of all employees who do not have supervisors

12. Retrieve SSN and department name for all employees

13. Retrieve the name and address of all employees who work for the 'Research' department

14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.

15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.

16. Retrieve all combinations of Employee Name and Department Name

17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.

18. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.

19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.

20. Select the names of employees whose salary does not match with salary of any employee in department 10.

21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.

22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.

23. Find the sum of the salaries and number of employees of all employees of the 'Marketing' department, as well as the maximum salary, the minimum salary, and the average salary in this department.

24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.

25. Delete all dependents of employee whose *ssn is '123456789'*.

26. Perform a query using alter command to drop/add field and a constraint in Employee table.

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COMPUTER SCIENCE	CCSC-301C	2021-'22	B.com(CA)

SEMESTER – III **PAPER – III** 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 MaintainablePrograms.

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 DataTypes.

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-Hillpublications.
2. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language" -

Pearsonpublications.

3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.

4. YashavantKanetkar - Let Us 'C' – BPBPublications.

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(**With Effect from Academic Year 2021-22**)

COMPUTER SCIENCE	CCSC-301P	2021-'22	B.Com.(CA)

SEMESTER – III   **PAPER – III**   Max. Marks 50

Lab List   **Programming in 'C'**   Pass Marks 20

No. of Hours per week: 2   **External: 25**   **Internal: 25**   **Credits: 2**

1. 1 Write C programs for
   a. Fibonacci Series
   b. Prime number
   c. Palindrome number
   d. Armstrong number.
2. Write a 'C' program for multiplication of two matrices
3. Write a 'C' program to implement string functions
4. Write a 'C' program to swap numbers
5. Write a 'C' program to calculate factorial using recursion
6. Write a 'C++' program to perform addition of two complex numbers using constructor
7. Write a program to find the largest of two given numbers in two
   different classesusing friend function
8. Program to add two matrices using dynamic contructor
9. Implement a class string containing the following functions:
   a. Overload + operator to carry out the concatenation of strings.
   b. Overload == operator to carry out the comparison of strings.
10. Program to implement inheritance.

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work

and shallencourage self/independent and group learning)

MEASURABLE
- Assignments
- Student seminars
- Field studies
- Study projects
- Group Discussion
- Visit to Software Technology parks / industries

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Semester I	Course Code	Course Title	Credits	Periods
B.Sc. (MPCS/ MCCS / MSCS)	CSCT11B	Problem Solving In C	4	60

Course Objectives:

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 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.

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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Semester I	Course Code	Course Title	Credits	Periods
B.Com.(Computer Applications	CABT11A	**Information Technology**	**4**	**75**

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

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 latestversion 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, modelling 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**

5.1 New 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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Semester I	Course Code	Course Title	Credits	Periods
B.Com. (E-Commerce)	CSCT11B	E–COMMERCE & WEB DESIGNING	4	60

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	Upon successful completion of this course, students should have the knowledge and skills to
CO1	Understand the structure of HTML its basic tags
CO2	Implement various HTML tags for web page development
CO3	Understand about implementing forms and frames in web page designing
CO4	Gain knowledge in E- commerce and its business models
CO5	Differentiate traditional and e – marketing and also gain knowledge in E-CRM and EPS

UNIT I: Introduction to Web Designing   **(12Hrs)**
   1.1 **Introduction**
   1.2   1.1.1 WWW and its Evaluation
   1.1.2 Define network and its advantages
   1.1.3 Types of networks
   1.1.4 Network Topologies
1.2 **HTML**
1.2 .1 Define HTML
   1.2.2   Structure of HTML
   1.2.3   Basic HTML tags
   1.2.4   Formatting HTML tags
UNIT II: HTML Tags   **(12Hrs)**
 2.1: **Lists**
   2.1.1 Ordered List
   2.1.2 Unordered List
 2.2 **Links**
   2.2.1 Link tag
   2.2.2 image tag
   2.2.3 Marquee tag
 2.3 **Tables**
   2.3.1 Table Creation
   2.3.2 Attributes of Table
UNIT III: Forms and Frames and CSS   **(12Hrs)**
 3.1 **forms**
   3.1.1 forms creation
   3.1.2 form tag

3.1.3 input fields of form

3.2 **Frames**

    3.2.1 Frame Creation

    3.2.2 Frameset tag

    3.2.3 frame tag

3.3 **Cascading Style Sheets**

    3.3.1 Introduction to CSS

    3.3.1 Types of CSS

    3.3.2 in-line Style Sheet

    3.3.3 internal Style Sheet

    3.3.4 External Style Sheet

UNIT IV: An Overview on E-Commerce   **(10Hrs)**

4.1.1 Introduction E-Commerce

1. Definition of E- Commerce and its advantages & disadvantages
2. Electronic Data Interchange (EDI)
3. E-Commerce transactional issues and challenges
4.1.4 Difference between Commerce and E-Commerce

4.2 Business Models for Ecommerce

1. B2C -Business to consumer.
2. B2B – Business to business
3. C2B – Consumer to business.
4. C2C – Consumer to consumer.

UNIT V: E-Marketing &E – CRM& Electronic Payment Systems   **(14Hrs)**

5.1 Online Marketing

1. Traditional Vs. E-Marketing
5.1.2 Online Marketing
5.1.3 E-Advertising
5.1.4 Internet marketing

5.2 E – CRM

    5.2.1 Definition of CRM and E-CRM and its Applications

    5.2.2 E- CRM Architectural components

    5.2.3 Definition & characteristics of E- SCM

    5.2.4 Benefits and goals of E – SCM

    5.2.5 E-Logistics of UPS

5.3 Electronic Payment Systems

    5.3.1 Types of EPS

    5.3.2 Traditional payment system and modern payment system

    5.3.3 Steps for electronic payment

    5.3.4 Payment security

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.

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Computer Science		2021-22	B.Com (Computers Applications)

Credits: 2

WEB DESIGNING LAB (NEW SYLLABUS)

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	Upon successful completion of this course, students should have the knowledge and skills to
CO1	Implement HTML tags.
CO2	Implementing lists and tables in web pages.
CO3	Implementing frames in web pages.
CO4	Implementing frames in web pages.
CO5	Creation of CSS in a web page.

1. Write a HTML program to print text in bold and italic font.
2. Write a HTML program to print Heading tags.
3. Write a HTML program using Text formatting tags
3. Write a HTML program to implement unordered lists.
4. Write a HTML program to implement order lists.
5. Write a html file which display 3 images at LEFT, RIGHT and CENTER respectively in the browser.
6 Create a HTML file which contains hyperlinks.
7 Write a HTML program to create a table
8. Write a HTML program to create a table using Row Span and Cols pan
9. Write a HTML program to create a table using cell padding and Row Spacing
10. Write a HTML program to create a simple form
11. Create a Registration form that interacts with the user. Collect login name, password, date of birth, gender, address, qualification.
12. Create a HTML page using frameset tag.
13 Write a Program to create an inline style sheet.
14. Write a program to create Embedded Style Sheet.
15. Write a program to create an external style sheet to illustrate the "Font" elements.

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Semester I	Course Code	Course Title	Credits	Periods
Life Skill Course	LSC1	**BASIC COMPUTER APPLICATIONS**	2	30

COURSE OBJECTIVES:

This course aims at providing exposure to students in skill development towards basic office applications.

Course Learning Outcomes:

After successful completion of the course, student will be able to:

1. Demonstrate basic understanding of computer hardware and software.
2. Apply skills and concepts for basic use of a computer.
3. Identify appropriate tool of MS office to prepare basic documents, charts, spreadsheetsand presentations.
4. Create personal, academic and business documents using MS office.
5. Create spreadsheets, charts and presentations.
6. Analyze data using charts and spread sheets.

Unit- I Basics of Computers: 8 Hrs

Definition of a Computer - Characteristics of computers, Applications of Computers – Block Diagram of a Digital Computer – I/O Devices, hardware, software human ware, application software, system software, Memories - Primary, Auxiliary and Cache Memory.

MS Windows – Desktop, Recycle bin, My Computer, Documents, Pictures, Music, Videos, Task Bar, Control Panel.

Unit-II: MS-Word: 8Hrs

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, MailMerge.

Unit-III: MS-Excel: 10Hrs

Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Inserting Rows/Columns –Changing column widths and row heights,Formulae, Referencing cells , Changing font sizes and colors, Insertion of Charts, Auto fill, Sort. **MS-PowerPoint:** Features of PowerPoint – Creating a Presentation - 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.

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

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

2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz, Group Discussion
4. Solving MCQ's available online.

5. Suggested student hands on activities:
   * Create two folders, Rename the folder, create two files each using notepad and paint, move the files from one folder to another folder, delete a file you have created, copy and paste text within notepad.

   * Create a letter head for your college with watermark, your resume, visiting card, brochure for your college activity, organization chart for your college, any advertisement, Prepare your Class time table.

   * Prepare your mark sheet, Prepare your class time table, Prepare a salary bill for an organization, Sort the bill as per the alphabetical order of the names, Get online weather data and analyze it with various charts.

   * Create a PowerPoint presentation for a student seminar.

Reference Books

1. Working in Microsoft Office – Ron Mansfield - TMH.
2. MS Office 2007 in a Nutshell –Sanjay Saxena – Vikas Publishing House.
3. Excel 2020 in easy steps-Michael Price – TMH publications

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Accredited by NAAC with "A" GradeISO 9001:2015 Certified Institution

DEPARTMENT OF COMPUTER SCIENCE

2021-22(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

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

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Title of the Paper: Data Structures   **Semester: II**

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of variousdata 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

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 andshall 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. 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 collaborative work.

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Semester II	Course Code	Course Title	Hours	Credits
BSC(MPCS/MCCS/MSCS)	CSCT21B	Data Structures Lab	30	2

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

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

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	Upon successful completion of this course, students should have the knowledge and skills to
CO1	Understand the structure of HTML its basic tags
CO2	Implement various HTML tags for web page development
CO3	Understand about implementing forms and frames in web page designing
CO4	Gain knowledge in E- commerce and its business models
CO5	Differentiate traditional and e – marketing and also gain knowledge in E-CRM and EPS

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

Introduction E-Commerce

Definition of E- Commerce and its advantages & disadvantages
Electronic Data Interchange (EDI)
E-Commerce transactional issues and challenges
Difference between Commerce and E-Commerce
Business Models for Ecommerce:B2C -Business to consumer.

B2B – Business to business C2B – Consumer to business.

C2C – Consumerto consumer.

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

Online Marketing
Traditional Vs. E-Marketing
Online Marketing
E-Advertising
Internet marketing
E – CRM
Definition of CRM and E-CRM and its Applications
E- CRM Architectural components
Definition & characteristics of E- SCM
Benefits and goals of E – SCM 2.2.5 E-Logistics of UP

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

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

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

  4.1 **HTML**

       .1Define HTML   4.1.2 Structure of HTML   4.1.3   Basic HTML tags

4.1.4   Formatting HTML tags

    Lists
   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)**

  Getting Started with Wix
   Adding and Editing Text
    Adding a Site Title
    Changing Your Text Font
    Creating a Clickable URL
    Adding Language Fonts
     Adding Elements to Your Site
     Arranging the Content on Your Site's Pages
     About the Header
     About the Footer
  Adding an Image to Your Page Background
   Uploading Your Own Background Image
    Adding a Video to Your Page Background
    Uploading Your Own Video Page Background
   Uploading Your Own Images
    Adding a Logo to Your Site
    Adding a Link to an Image

  Gallery and Button
    Adding a Gallery
    Cropping and Editing Gallery Images
    Adding and Setting Up an Icon Button
    Adding a Link to a Button
  Video
    Adding a Video from YouTube
    Retrieving a YouTube URL

Menu
    Adding a Site Menu
    Customizing Your Menu Design
    Adding and Deleting a Menu Folder
    Reordering Menu Items
    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", dramatic.2.Daniel Amor, E-Business R(Evolution), Pearson Edude, New Delhi, 2005.

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

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Computer Science	**CABT21A**	**2021-22**	**B. Com (Computers Applications)**

Semester - II   **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 Row Span and Cols pan.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.

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Title of the Paper: **Information Technology**   Semester: II

Course Code	**CABT21A**	Course Delivery Method	Class Room / Blended Mode – Both
Credits	4	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 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 Computer)	CABT21A	Information Technology	4	75

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 latestversion 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, modeling 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.

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: II

Course Code	**CABT22A**	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 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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COMPUTER SCIENCE	CABT22A	2021-'22	B.Com(E-Commerce-computers)

SEMESTER – II   PAPER – II   Max. Marks 75   Pass Marks 30   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)
Sanjay Saxsena, Microsoft Office, 4.Microsoft Office, BPB

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Title of the Paper: DIGITAL MARKETING

Course Code	SDCCSC02	Course Delivery Method	Class Room / Blended Mode – Both
Credits	**2**	CIA Marks	10
No. of Lecture Hours / Week	2	Semester End Exam Marks	40
Total Number of Lecture Hours	30	Total Marks	50
Year of Introduction :2020-21	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Objective:

The aim of the Digital Marketing Course is to provide students with the knowledge about business advantages of the digital marketing and its importance for marketing success. The application of the gained knowledge, skills and competences will help students in forming digital marketing plan in order to manage a digital marketing performance efficiently.

Course Outcomes:

COURSE OUTCOME NO	on successful completion of this course, students should have the knowledge and skills to
CO1	derstand fundamental concepts of Digital Marketing and Channels (PO1, PO7, PSO1, PSO4)
CO2	derstand how to optimize a Web site and SEO optimization)1, PO7, PSO1, PSO4)
CO3	nderstand Social Media Plan for measuring effects of digital marketing)1, PO7, PSO1, PSO4)

UNIT-I: INTRODUCTION: **5 Periods**

What is Digital Marketing?
Difference between Traditional Marketing and Digital Marketing?
Benefits of Digital Marketing?
Latest Digital Marketing Trends
Digital Marketing Platforms
Digital Marketing Strategies for Websites
Career Opportunities in Digital Marketing
Difference Between Digital Marketing , Online Marketing and Internet Marketing
Functions and Types of Digital marketing
    What is Marketing and how to build Online Marketing Plan
    Digital Marketing Process
    How to increase Visibility and People Engagement
    Traffic Generation Techniques , Leads and How to gauge Performance Evaluation
    Digital Marketing Techniques for Product Marketing and Service Marketing

UNIT-II: SEO Training (Search Engine Optimization)   12Periods

Introduction to SEO
What are Search engines and How Search Engines Work
Search Engine Algorithms and Latest Updates
Keyword Research
Google Trends
Purpose of website analytics
How to choose Website Analysis Tools
Installing Google Analytics in website
Competitive Analysis
    Domain Registration and Hosting Plans
    Keyword Placement
    SEO Content Writing and Rewriting
    Google Webmaster Tools
    Sitemap Creation
    Robots.txt File Creation
    Google Updates and their effects in website Rankings.
    On page Optimization strategies

Unit-III:SEM Training (Search Engine Marketing)   13Periods

Introduction to Free and Paid Marketing
What is Search Engine Marketing?
What is Link Building
Advantages and Disadvantages of Link Building
Difference Between Search engines and Directories
Directory Submission Techniques
Classified Postings
Press Release Postings
    Article Posting Techniques
    Forum Postings
    Advantages and Disadvantages of Forums
    How and when to Participate in Groups
    Trade Fairs and Trade lead Postings
    Participating in Questions and Answers sites
    What are Do Follow and No Follow Links
    SMO Training (Social Media Optimization)Introduction to social media optimization and Social Media Marketing
    Twitter Marketing
    Facebook Marketing, Facebook for Business , Advantages and Disadvantages
    LinkedIn Account creation and LinkedIn Marketing
    Social Bookmarking Sites, Advantages and Disadvantages of Submitting your website toSocial bookmarking Sites

TEXT/ REFERENCE BOOKS:

1. The Beginner's Guide to Digital Marketing (2015). Digital Marketer. Pulizzi,J.(2014) Epic Content Marketing, Mcgraw Hill Education.
2. Ryan, D. (2014). Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation, Kogan Page Limited.
3. Chaffey, D., e-Marketing Excellence: Planning and Optimizing Your Digital Marketing, Burlington: Elsevier.

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Title of the Paper: OBJECT ORIENTATED PROGRAMMING THROUGH JAVA

Semester: IV

Course Code	CSCT01	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 Objective: To introduce the fundamental concepts of Object-Oriented programming and to design & implement object oriented programming concepts in Java.

Course Outcomes:

CO$_1$	Understand the benefits of a well-structured program
CO2	Understand different computer programming paradigms
CO3	Understand underlying principles of Object-Oriented Programming in Java
CO4	Develop problem-solving and programming skills using OOP concepts
CO5	Develop the ability to solve real-world problems through software development inhigh-level programming language like Java

Syllabus

Java Database Connectivity: Database Servers, Database Clients, JDBC (Java Database Connectivity), Working with Oracle Database, Working with MySQL Database, Stages in a JDBC Program, Registering the Driver, Connecting to a Database, Preparing SQL Statements, Using jdbc–odbc Bridge Driver to Connect to Oracle Database, Retrieving Data from MySQL Database, Retrieving Data from MS Access Database, Stored Procedures and Callable Statements, Types of Result Sets

BOOKS:

1. Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao &Kogent Learning Solutions Inc.
2. E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.
3. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TMH.
4. Deitel& Deitel. Java TM: How to Program, PHI (2007)

COMPUTER SCIENCE	CSCT01P	**2021-'22**	**B.Sc.(MPCS,MCCs)**

SEMESTER – IV   **PAPER – 1V**   **Max. Marks 50**

Lab List: OBJECT ORIENTATED PROGRAMMING THROUGH JAVA

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

1. Write a program to read *Student Name, Regd.No, Marks [5]* and calculate Total, *Percentage, and Result*. Display all the details of students

2. Write a program to perform the following String Operations
   a. Read a string
   b. Find out whether there is a given substring or not
   c. Compare existing string by another string and display status
   d. Replace existing string character with another character
   e. Count number of works in a string

3. Java program to implements Addition and Multiplication of two N X N matrices.

4. Java program to demonstrate the use of Constructor.

5. Calculate area of the following shapes using method overloading.
   a. Triangle
   b. Rectangle
   c. Circle
   d. Square

6. Implement inheritance between *Person (Aadhar, Surname, Name, DOB, and Age)* and *Student (Admission Number, College, Course, Year)* classes where ReadData(), Display Data() are overriding methods.

7. Java program for implementing Interfaces

8. Java program on Multiple Inheritance.

9. Java program for to display *Serial Number from 1 to N* by creating two Threads

10. Java program to demonstrate the following exception handlings
    a. Divided by Zero
    b. Array Index Out of Bound
    c. File Not Found
    d. Arithmetic Exception
    e. User Defined Exception

11. Create an Applet to display different shapes such as Circle, Oval, Rectangle, Square and Triangle.

12. 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: OPERATING SYSTEM   **Semester: IV**

Course Code	CSCT41C	Course Delivery Method	Class Room / BlendedMode – 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 Objective: This course aims to introduce the structure and organization of a file system. It emphasizes various functions of an operating system like memory management, process management, device management, etc.
.**Course Outcomes:**

CO_1	Know Computer system resources and the role of operating system in resourcemanagement with algorithms
CO2	Understand Operating System Architectural design and its services
CO3	Gain knowledge of various types of operating systems including Unix and Android
CO4	Understand various process management concepts includingscheduling,synchronization, and deadlocks.
CO5	Have a basic knowledge about multithreading.
CO6	Comprehend different approaches for memory management.

SYLLABUS

UNIT- I what is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.

UNIT- II Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries; Process Scheduling, Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT III Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery. Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter- process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

UNIT IV Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies– Fixed and -Variable Partitions, Paging, Segmentation, Virtual Memory.

UNIT V File and I/O Management, OS security : Directory Structure, File Operations, File Allocation Methods, Device Management, Pipes, Buffer, Shared Memory, Security Policy Mechanism, Protection, Authentication and Internal Access Authorization Introduction to Android Operating System, Android Development Framework, Android Application Architecture, Android Process Management and File System, Small Application Development using Android Development Framework.

REFERENCE BOOKS:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and GregGagne (7thEdition) Wiley India Edition.

2. Operating Systems: Internals and Design Principles by Stallings (Pearson)

3. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)

4. Online Resources for UNIT V

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COMPUTER SCIENCE	CSCT41C	2021-'22	B.Sc.(MPCS,MCCs)

SEMESTER – IV   **PAPER – V**   **Max. Marks 50Lab**

List: OPERATING SYSTEM LAB USING C/JAVA

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

1. Write a program to implement Round Robin CPU Scheduling algorithm
2. Simulate SJF CPU Scheduling algorithm
3. Write a program the FCFS CPU Scheduling algorithm
4. Write a program to Priority CPU Scheduling algorithm
5. Simulate Sequential file allocation strategies
6. Simulate Indexed file allocation strategies
7. Simulate Linked file allocation strategies
8. Simulate MVT and MFT memory management techniques
9. Simulate Single level directory File organization techniques
10. Simulate Two level File organization techniques
11. Simulate Hierarchical File organization techniques
12. Write a program for Bankers Algorithm for Dead Lock Avoidance
13. Implement Bankers Algorithm Dead Lock Prevention.
14. Simulate all Page replacement algorithms.
    a) FIFO
    b) LRU
    c) LFU

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Title of the Paper: Database Management System   **Semester: IV**

Course Code	CCSC401G	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 Objective: The objective of the course is to introduce the design and development of databases with special emphasis on relational databases.

Course Outcomes:

CO_1	Able to have knowledge about database, Traditional File System.
CO2	Be able to Design a database using Relation models and Data Modeling
CO3	Store, retrieve data in database using Integrity constraints and Normal Forms.
CO4	Be able to implement various SQL queries
CO5	Be able to implement various Procedural SQL queries and

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COMPUTER SCIENCE	CCSC402G	2021-'22	B.Com.(CA)

SEMESTER – IV **PAPER – IV** **Max. Marks 70**

<u>Syllabus</u>: 'Database Management System

UNIT-I Overview of Database Management System

Introduction, Data and Information, Database, Database Management System, Objectives of DBMS, Evolution of Database Management System, Classification of Database Management System.

UNIT-2: File-Based System

File Based System. Drawbacks of File-Based System, DBMS Approach, Advantage of DBMS, Data Models, Components of Database System, Database Architecture, DBMS Vendors and their products.

UNIT-III: Entity-Relationship Model:

Introduction, The Building Blocks of an Entity-Relationship, Classification of Entity Set, Attribute Classification, Relationship Degree, Relationship Classification, Generalization and Specialization, Aggregation and Composition, CODD's Rules, Relational Data Model, Concept of Relational Integrity.

UNIT-IV: Structured Query Language

Introduction, History of SQL Standards, Commands in SQL, Data types in SQL, Data Definition Language (DDL),Selection Operation Projection Operation, Aggregate Functions, Data Manipulation Language, Table Modification, Table Truncation, Imposition of Constraints, Set Operations.

UNIT-V: **PL/SQL**:

Introduction, Structure of PL/SQL,PL/SQL Language Elements, Data Types, Control Structure, Stepsto Create a PL/SQL Program, Iterative Control Cursors, Steps to Create a Cursor, Procedure, Functions, Packages, Exceptions Handling, Database Triggers, Types of triggers.

- **<u>References:</u>**
- Paneer selvam: Database Management system,PHI.
- David Kuklinski, Osborne, Data management system McGraw Hill Publication.
- Shgirley Neal And Kenneth LC Trunik Database management system in Business-PHI.
- Godeon C. EVEREST, Database Management-McGraw Hill Book Company.
- MARTIN,Database Management-Prentice Hall of India, New Delhi.
- Bipin C.Desai ,`An Introduction to Database System`,Galgotia Publications
- Navathe, Database Management System.

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

COMPUTER SCIENCE	CCSC401P	**2021-'22**	**B. COM(CA)**

SEMESTER –IV   **PAPER – IV**   **Max. Marks 50**

Lab List   **DATA BASE MANAGEMENT SYSTEMS**

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

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

Create Student database using the following tables.
STUDENT: Sno : primary key, numbers name : NOT NULL, varchar2 Address: Varchar2
COURSE:Sno : Foreign key.Course Name : varchar2
Queries:
1. Alter table by adding a column fees in table COURSE.
2. Alter table by modifying the address to VARCHAR2(20)
3. Create a view on which the students who joined in one course only.

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

Title of the Paper: <mark>Object Oriented Programming with Java</mark>   **Semester: IV**

Course Code	CCSC402G	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 Objective: The objective of the course is to introduce the design and development of databases with special emphasis on relational databases.

Course Outcomes:

CO$_1$	Understanding the meaning and necessity of audit in modern era
CO2	Comprehend the role of auditor in avoiding the corporate frauds
CO3	Identify the steps involved in performing audit process
CO4	Determine the appropriate audit report for a given audit situation
CO5	Apply auditing practices to different types of business entities

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COMPUTER SCIENCE	CCSC402G	2021-'22	B.Com.(CA)

SEMESTER – IV   **PAPER – V**   **Max. Marks 70**

SYLLABUS: '**OBJECT ORIENTATED PROGRAMMING THROUGH JAVA**'

Unit I: Introduction to OOPs: Problems in Procedure Oriented Approach, Features of Object Oriented Programming
Introduction to Java: Features of Java, The Java Virtual Machine (JVM), Parts of Java program, Naming Conventions in Java, Data Types in Java, Operators in Java, Reading Input using scanner Class, Displaying Output using System. out.println (), Command Line Arguments.

Unit II: Control Statements in Java: if... else, do... while Loop, while Loop, for loop, Switch Statement, break Statement, continue Statement
Arrays: Types of Arrays, array name, length,
Strings: Creating Strings, String Class Methods, String Comparison, Immutability of Strings.

Unit III: Classes and Objects: Object Creation, Initializing the Instance Variables, Access Specifiers, Constructors
Inheritance: Inheritance, Types of Inheritance
Polymorphism: Method overloading, Operator overloading
Abstract Classes: Abstract Method and Abstract Class

Unit IV: Packages: Package, Different Types of Packages, Creating Package and Accessing a Package
Streams: Stream classes, Creating a File using File Output Stream, Reading Data from a File using File Input Stream, Creating a File using File Writer, Reading a File using File Reader

Unit V: Exception Handling: Errors in Java Program, Exceptions, throws Clause, throw Clause, Types of Exceptions
Threads: Single Tasking, Multi-Tasking, Uses of Threads, Creating a Thread and Running it, Terminating the Thread, Thread Class Methods.

References:

1. The Complete Reference JAVA Seventh Edition Herbert Schildt. Tata McGraw Hill Edition.

2. Core Java: An Integrated Approach, Dr. R. Nageswara Rao & Kogent Learning Solutions Inc.

3. E. Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company

Online Resources:
https://stackify.com/java-tutorials/
https://www.w3schools.com/java/
https://www.javatpoint.com/java-tutorial

https://www.tutorialspoint.com/java/index.html

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COMPUTER SCIENCE	CCSC402P	**2021-'22**	**B.Com.(CA)**

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

Lab List: OBJECT ORIENTATED PROGRAMMING THROUGH JAVA

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

1. Write a program to read *Student Name, Regd.No, Marks [5]* and calculate Total,*Percentage, and Result*. Display all the details of students

2. Write a program to perform the following String Operations

    a. Read a string

    b. Find out whether there is a given substring or not

    c. Compare existing string by another string and display status

    d. Replace existing string character with another character

    e. Count number of works in a string

3. Java program to implements Addition and Multiplication of two N X N matrices.

4. Java program to demonstrate the use of Constructor.

5. Calculate area of the following shapes using method overloading.

    a. Triangle b. Rectangle c. Circle d. Square

6. Implement inheritance between *Person (Aadhar, Surname, Name, DOB, and Age)* and *Student (Admission Number, College, Course, Year)*classes where ReadData(), Display Data() are overriding methods.

7. Java program on Multiple Inheritance.

8. Java program for to display *Serial Number from 1 to N* by creating two Threads

9. Java program to demonstrate the following exception handlings

    a. Divided by Zero b. Array Index Out of Bound c. File Not Found d. Arithmetic Exception

    e. User Defined Exception

. 10. 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: WEB TECHNOLOGY

Semester: VI

Course Code	**CSC-601GE**	Course Delivery Method	Class Room / BlendedMode – 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 :2017-18	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage ofRevision: 0%

Course Objectives:

To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.

Course Outcomes:

CO$_1$	Understand the basic structure of a HTML design and develop a website usingdifferent text Formatting tags, images, links, lists and tables.
CO2	Understand to style a webpage using CSS and Basic Concepts of Java Scripts
CO3	Understand to style a webpage Using Objects in Java Script and DHTML.
CO4	Understand the Basic Concepts of XML and Defining Data for Web Applications
CO5	Understand the Concepts of JS.

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COMPUTER SCIENCE	CSC-601(GE)	2021-'22	B.Sc.(MPCs & MCCs)

SEMESTER – VI   **PAPER – VII**   Max. Marks 70

 <u>Syllabus</u>   **WEB TECHNOLOGIES**

 NO of Hours: 4   **<u>No of Credits: 3</u>**   **Pass Marks 28**

Course Objectives:

1. To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.
2. To provide skills to design interactive and dynamic web sites.

Unit -I   Introduction to XHTML: **12 Hrs**

Introduction to HTML, Basic html, Document body text, Hyper links, Adding more formatting Lists, Tables, Images, Multimedia Objects, Frames, Forms and XHTML.

Unit- II: CSS: **12 Hrs**

Cascading Style Sheets: Introduction, Defining your own styles, properties and values in styles, Formatting blocks of information, Layers.

Java Script: java Script, the basics, Variables, String Manipulations, Mathematical functions, Statements, Operators, Arrays, Functions.

Unit –III: Objects in Java Script & Dynamic HTML with Java Script   12 Hrs

Objects in Java Script: Data and objects in java script, Regular expressions, Exception Handling, Built in objects, Events.

Dynamic HTML with Java Script: Data validation, Opening a new window, Messages and Confirmations, The status bar, writing to a different frame, Rollover buttons, Moving images, multiple pages in a single download, A text-only menu system, Floating logos.

Unit –IV: XML Defining Data for Web Applications   **12 Hrs**

XML: Introduction to XML, Basic XML, document type definition, XML Schema, Document object model, presenting XML, Using XML parser.

UNIT-V: JSP: **10Hr's**

JSP Lifecycle, Basic Syntax, EL (Expression Language), EL Syntax, Using EL Variables

Prescribed Books:

1. Chris Bates, Web Programming Building Internet Application, Second Edition, Wiley   (2007)
2. Head First Servlet and JSP 2nd Edition, Bryan Basham, Kathy Sierra
3. Uttam Kumar Roy, Web Technologies from Oxford University Press

Student Activities:

1. Prepare a web site for your college
2. Prepare your personal website

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COMPUTER SCIENCE	CSC-601(GE)	2021-'22	B.Sc.(MPCs & MCCs)

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

Lab List   **WEB TECHNOLOGIES**

No. of Hours per week: 2   **External: 25**   **Internal: 25 Credits: 2**

1. Write an HTML program to demonstrate text formatting, working with images andhyper links
2. Write an HTML program to create Student Marks sheet preparation.
3. Write an HTML program to explain String manipulation-using functions.
4. Write an HTML program to explain <form> events
5. Write an HTML program to perform all arithmetic operations using java script.
6. Develop a HTML Form, which accepts any Mathematical expression. WriteJavaScript code to Evaluates the expression and Displays the result.
7. Create a form for Student information. Write JavaScript code to find Total, Average,Result and Grade.
8. Create a form for Employee information. Write JavaScript code to find DA, HRA, PF,TAX, Gross pay, Deduction and Net pay.
9. Create a form consists of a Multiple choice questions that validates the answerdynamically and displaying result using java script.
10. Write a java script to work with following

  a. Date display b. Calendar   c. Copy Selected Text

  b. IP Address

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Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: PHP, MySql & WORDPRESS

Semester: IV

Course Code	**CSC-602CE**	Course Delivery Method	Class Room / BlendedMode – 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 :2017-18	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Course Objectives:

To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.

Course Outcomes:

CO$_1$	Understand the concepts Of PHP and MY SQL Installations.
CO2	Able to know the basic concepts Function and Working with Functions.
CO3	Understand the concepts of FORMS and working with FORMS.
CO4	Understand the concepts of MY SQL and MY SQL Components.
CO5	Able to know the concepts of WORD PRESS.

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COMPUTER SCIENCE	CSC-602CE	2021-'22	B.Sc.(MPCs& MCCs)

SEMESTER – VI   **PAPER – VIII**   Max. Marks 70

<u>Syllabus</u>   **PHP, MySql & Word Press**

<u>NO Of Hours:4</u>   <u>Credits: 3</u>   Pass Marks 28

Course Objective: To introduce the concept of PHP and to give basic Knowledge of PHP. Learn about PHP Syntax., Arrays, PHP Loops, PHP and MySql connectivity, PHP form validation, PHP form handling. Overview of MySql and PHPMyAdmin, Understand basic concepts of how a database stores information via tables, Understanding of SQL syntax used with MySQL, Learn how to retrieve and manipulate data from one or more tables, Know how to filter data based upon multiple conditions, Updating and inserting data into existing tables, Learning how the relationships between tables will affect the SQL, The advantages of store procedures with storing data using variables and functions, How SQL can be used with programming languages like PHP to create dynamic websites for visitors, Review of some sample PHP projects interacting with MySql.

UNIT-1: **Installing and Configuring MySQL**:   **10 Hrs**
Current and Future Versions of MySQL, How to Get MySQL, Installing MySQL on Windows, Trouble Shooting your Installation, Basic Security Guidelines, Introducing MySQL Privilege System, Working with User Privileges. Installing and Configuring Apache: Current and future versions of Apache, Choosing the Appropriate Installation Method, Installing Apache on Windows, Apache Configuration File Structure, Apache Log Files, Apache Related Commands, Trouble Shooting. Installing and Configuring PHP: Building PHP with Apache on Windows, php.ini.Basics, The Basics of PHP scripts. 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.

Unit – II: Working with Functions: **10 Hrs**
What is function?, Calling functions, Defining Functions, Returning the values from User-Defined Functions, Variable Scope, Saving state between Function calls with the static statement, more about arguments. Working with Arrays: What are Arrays? Creating Arrays, Some Array-Related Functions. Working with Objects: Creating Objects, Object Instance 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.

Unit – III: Working with Forms: **15 Hrs**
Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, Working with File Uploads. Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users. Working with Files and Directories: Including Files with inclue(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories.

Unit – IV: Introduction to MySQL   15Hrs

Introduction to My SQLand Interfacing with Databases through PHP Understanding the database design process: The Importance of Good Database Design, Types   of Table Relationships, Understanding Normalization.   Learning basic SQL Commands: Learning the MySQL Data types, Learning the Table Creation Syntax, Using Insert Command, Using SELECT Command, Using WHERE in your Queries, Selecting from Multiple Tables, Using the UPDATE command to modify records, Using RELACE Command, Using the DELETE Command, Frequently used string functions in MySQL, Using Date and Time Functions in MySQL. Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data.

Unit – V: Word press   10Hrs

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. Working with themes-parent and child themes, using featured images, configuring settings.

References:

1. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach yourself, Pearson Education (2007).
2. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).

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COMPUTER SCIENCE	CSC-602CE	2021-'22	B.Sc.(MPCS&MCCS)

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

Lab List: PHP, MySql & Word Press Lab

No. of Hours per week: 3   **External: 25**   **Internal: 25**   **Credits: 2**

MySQL Lab Cycle

Cycle -1

An Enterprise wishes to maintain the details about his suppliers and other corresponding details. For that he uses the following details.

Suppliers (sid: Integer, sname: string, address: string)
Parts (pid: Integer, pname: string, color: string)
Catalog (sid: integer, pid: integer, cost: real)

The catalog relation lists the prices charged for parts by suppliers.
Write the following queries in SQL:
1. Find the pnames of parts for which there is some supplier.
2. Find the snames of suppliers who supply every part.
3. Find the snames of supplier who supply every red part.
4. Find the pnames of parts supplied by London Supplier abd by no one else.
5. Find the sid's of suppliers who charge more for some part than the average cost of that part.
6. For each part, find the sname of the supplier who charges the most for that part.
7. Find the sid's of suppliers who supply only red parts.
8. Find the sid's of suppliers who supply a red and a green part.
9. Find the sid's of suppliers who supply a red or green part.
10. Find the total amount has to pay for that suppler by part located from London.

Cycle – 2

An organisation wishes to maintain the status about the working hours made by his employees. For that he uses the following tables.

Emp (eid: integer, ename: string, age: integer, salary: real)
Works (eid: integer, did: integer, pct_time: integer)
Dept (did: integer, budget: real, managerid: integer)
An employee can work in more than one department; the pct_time field of the works relation shows the percentage of time that a given employee works in a given department.

Resolve the following queries.

1. Print the names and ages of each employee who works in both Hardware and Software departments.
2. For each department with more than 20 full time equivalent employees (i.e., where the part-time and full-time employees add up to at least that many full-time employees), print the did's together with the number of employees that work in that department.

3. Print the name of each employee whose salary exceeds the budget of all of the departments that he or she work in.
4. Find the managerid's of managers who manage only departments with budgets greater than 1,000,000.
5. Find the enames of managers who manage the departments with largest budget.
6. If a manager manages more than one department, he or she controls the sum of all the budgets for those departments. Find the managerid's of managers who control more than 5,000,000.
7. Find the managerid's of managers who control the highest amount.
8. Find the average manager salary.

PHP Lab Cycle

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display the today's date.
3. Write a PHP Program to read the employee details.
4. Write a PHP Program to display the
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Write a PHP Application to perform demonstrate the college website.
8. Write a PHP application to add new Rows in a Table.
9. Write a PHP application to modify the Rows in a Table.
10. Write a PHP application to delete the Rows from a Table.
11. Write a PHP application to fetch the Rows in a Table.
12. Develop an PHP application to make following Operations
    i. Registration of Users.
    ii. Insert the details of the Users.
    iii. Modify the Details.
    iv. Transaction Maintenance.
        a) No of times Logged in
        b) Time Spent on each login.
        c) Restrict the user for three trials only.
        d) Delete the user if he spent more than 100 Hrs of transaction.

Wordpress Lab

1. Installation and configuration of word press.
2. Create a site and add a theme to it.

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Title of the Paper: JQUERY/AJAX/JSON/ANGULAR JS

Semester: VI

Course Code	**CSC-603CE**	Course Delivery Method	Class Room / BlendedMode – 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 :2017-18	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage of Revision: 0%

Course Objectives:

To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.

Course Outcomes:

CO$_1$	Understand the concepts Of HTML and JQUERY
CO2	Understand the concepts JQUERY and CSS Methods using DOM Attributes
CO3	Understand the concepts of JQUERY USER INTERFACE Programs
CO4	Understand the concepts of AJAX and JSON Objects
CO5	Develop the ability to solve real-world problems through software development inhigh-level programming language like ANGULAR JS and ANIMATIONS

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COMPUTER SCIENCE	CSC-603CE	2021-'22	B.Sc.(MPCs,MCCs)

SEMESTER – VI   **PAPER – IX**   **Max. Marks 70**

Syllabus   Advanced java Script: JQUERY/AJAX/JSON/ANGULAR JS

NO Of Hours:4   **Credits: 3**   **Pass Marks 28**

Course Objective: To impart knowledge in designing a webpage in a structured way by using advanced java script ie., using different scripting languages

UNIT-1: JQuery – Basics: **10 Hrs**
String, Numbers, Boolean, Objects, Arrays, Functions, Arguments, Scope, Built-in Functions. jQuerySelectors: CSS Element Selector, CSS Element ID Selector, CSS Element Class Selector, CSS Universal Selector, Multiple Elements E, F, G Selector, Callback Functions. jQuery – DOM Attributes: Get Attribute Value, Set Attribute Value. jQuery – DOM Traversing : Find Elements by index, Filtering out Elements, Locating Descendent Elements, JQuery DOM Traversing Methods.

Unit – II: jQuery – CSS Methods :   **10 Hrs**
Apply CSS Properties, Apply Multiple CSS Properties, Setting Element Width & Height, JQuery CSS Methods. jQuery – DOM Manipulation Methods: Content Manipulation, DOM Element Replacement, Removing DOM Elements, Inserting DOM elements, DOM Manipulation Methods. jQuery – Events Handling: Binding event handlers, Removing event handlers, Event Types, The Event Object, The Event Attributes. jQuery – Effects: JQuery Effect Methods, jQuery Hide and Show, jQuery Toggle, jQuery Slide – slideDown, slideUp, slideToggle, jQuery Fade – fadeIn, fadeOut, fadeTo, jQuery Custom Animations

Unit – III: Intro to jQuery UI   **15 Hrs**
, Need of jQuery UI in real web sites, Downloading jQuery UI, Importing jQuery UI, Draggable, Droppable, Resizable, Selectable, Sortable, Accordion, Auto Complete, Button Setϖ, Date Picker, Dialog, Menu, Progress Bar, Slider, Spinner, Tabs, Tooltip, Color Animation, Easing Effects, addClass, removeClass, Effects, jQuery UI themes, Customizing jQuery UI widgets / plug-ins, jQuery UI with CDN, Consuming jQuery Plug-ins from 3rd party web sites jQuery Validations, Intro to jQuery validation plug-in, Using jQuery validation plug-in, Regular expressions.

Unit – IV: Intro to AJAX   **15 Hrs**
Need of AJAX in real web sites, Getting database data using jQueryAJAX, Inserting, Updating, Deleting database data using jQuery-AJAX Grid Development using jQuery-AJAX Intro to JSON JSON syntax, Need of JSON in real web sites, JSON object, JSON array, Complex JSON objects, Reading JSON objects using jQuery.

Unit – V: Intro to AngularJS   **15 Hrs**
Need of AngularJS in real web sites, Downloading AngularJS, AngularJS first example, AngularJS built-in directives, AngularJS expressions, AngularJS modules, AngularJS controllers, AngularJS scope AngularJS dependency injection AngularJS, bootstrapping AngularJS data bindings, AngularJS

$watch, AngularJS filters, AngularJS events, AngularJS AJAX, Ng-repeat, AngularJS with json arrays, AngularJS registration form and login form, AngularJS CRUD operations, AngularJS Animations, AngularJS validationsϖ AngularJS $q, AngularJS custom values, AngularJS custom factories, AngularJS custom services, AngularJS custom directives, AngularJS custom providers, AngularJS Routing, AngularUI Routing.

References:
1. jQuery UI 1.8: The User Interface Library for jQuery by Dan Wellman
2. jQuery Fundamentals by Rebecca Murphey 3. Ajax: The Complete Reference by Thomas

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Title of the Paper: PROJECT (Java, PHP & MYSQL)   **Semester: VI**

Course Code	**CSC-604GE**	Course Delivery Method	Class Room / BlendedMode – 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 :2017-18	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage ofRevision: 0%

Course Objectives:

To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.

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COMPUTER SCIENCE	CSC PROJ-602 P	2021-'22	B.Sc.(MPCs,MCCs)

SEMESTER – VI   PROJECT (Java, PHP & MYSQL)   **Max. Marks 100**
OBJECTIVE

The objective of the Project Course is to help the students to study, analyze and design software or utility for different problems or applications. This will improve the skills of software development of the students.

MARKS FOR PROJECT EVALUATION

The project course will be evaluated for **100** Marks, of which **75** marks are meant for the practical evaluation of a project and **25** marks are allotted for attending viva-voce examination. The passing minimum in the project work will be 50% of the total mark. i.e. the student should get minimum 50% marks in the project evaluation and the viva-voce examination. Thus, the minimum mark the student is required to obtain is 50 out of 100 marks.

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Title of the Paper: TALLY   **Semester: VI**

Course Code	**CSC-605CE**	Course Delivery Method	Class Room / BlendedMode – 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 :2017-18	Year of Offering: 2021 - 22	Year of Revision: ----	Percenta ge of Revision: 0%

Course Objectives:

To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.

Course Outcomes:

CO_1	Able to understand the basic concepts of TALLY
CO2	Able to understand the installation of TALLY Software.
CO3	Able to implement the concepts of ledgers
CO4	Able to implement the concepts of vouchers
CO5	Able to implement the basic concepts of final accounts

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COMPUTER SCIENCE	CCSC-605CE	2021-22	B.Com (C.A)

<u>**SEMESTER –VI**</u>   **PAPER – IX**   **Total: 60 Hrs**

Syllabus   **TALLY**   **Max.Marks:70**

<u>**Credits 3**</u>   **NO Of Hours 5**   **Pass Marks 28**

Unit-I: Introduction to Tally: **12Hrs**

Introduction, Software versions of Tally, Terminology related to Accounts credit & Debit, Journal, Ledger, Voucher, Group etc. Difference between Manual Accounting and Accounting Packages. Features and advantages of Tally.

Unit-II: Introduction of Tally Software   **12Hrs**

Introduction of Tally Software Creation of a company, Gateway of Tally, Accounts Information, Groups, pre defined Groups, Creation of New Groups, and Creation of subGroup.

Unit-III: Ledgers   **12Hrs**

Ledger Creation Single and multiple Ledgers, Displaying & altering Ledgers, configure Ledger, Stock Ledger, Ledgers and their Group Allocation.

Unit-IV: Vouchers   **12Hrs**

Types of vouchers – recording of vouchers – entry of payment voucher, Receipt voucher, sales voucher, purchase voucher, Journal Voucher, Contra Voucher, Debit & Credit Note. Creating New Voucher types, customizing the Existing voucher types, Alternation of Voucher, Deletion of Voucher.

Unit-V: Final Accounts   **12Hrs**

Customizing the final accounts – Profit and Loss Account, Balance Sheet. Key board shortcuts in Tally. Generating the Reports from Tally, Trial Balance, Account Books, Sales, Purchase, Journal Registers, Statement of Accounts, Day Book, List of Accounts.

Reference Books:

1. K. Kiran Kumar, Tally ERP9.

2. Tally 9 In Simple Steps, Kogent solutions Inc., John Wiley & Sons, 2008.

3. Narmata Agarwal, Financial Accounting on Computers Using Tally, Dreamtech Press, 2000.

4. Tally 9.0, Google eBook, Computer World.

5. Vikas Gupta, Comdex Computer and Financial Accounting with Tally 9.0, 2007.

COMPUTER SCIENCE	CSC-603CE	2021-'22	B.Sc.(MPCS&MCCs)
SEMESTER – VI	**PAPER – IX**		**Max. Marks 50**

Lab List Advanced java Script: JQUERY/AJAX/JSON/ANGULAR JS
No. of Hours per week: 3   External: 25   Internal: 25   Credits:2

1. Using jQuery find all textareas, and makes a border.Then adds all paragraphs to the jQuery object to set their borders red.

2. Using jQuery add the class "w3r_font_color" and w3r_background to the last paragraph element.

3. Using jQuery add a new class to an element that already has a class.

4. Using jQuery insert some HTML after all paragraphs.

5. Using jQuery insert a DOM element after all paragraphs.

6. Convert three headers and content panels into an accordion. Initialize the accordion And specify the animate option

7. Convert three headers and content panels into an accordion. Initialize the accordion and specify the height.

8. Create a pre-populated list of values and delay in milliseconds between a keystroke occurs and a search is performed.

9. Initialize the button and specify the disable option.

10. Initialize the button and specify an icon on the button.

11. Initialize the button and do not show the label.

12. Create a simple jQuery UI Datepicker. Now pick a date and store it in a textbox.

13. Initialize the date picker and specify a text to display for the week of the year column heading.

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Title of the Paper: E-COMMERCE   **Semester: VI**

Course Code	**CSC-606CE**	Course Delivery Method	Class Room / BlendedMode – 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 :2017-18	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage ofRevision: 0%

Course Objectives:

To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.

Course Outcomes:

CO$_1$	Understand the benefits of a well-structured program
CO2	Understand different computer programming paradigms
CO3	Understand underlying principles of Object-Oriented Programming in Java
CO4	Develop problem-solving and programming skills using OOP concepts
CO5	Develop the ability to solve real-world problems through software development inhigh-level programming language like Java

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COMPUTER SCIENCE	CCSC-606CE	2021-22	B.Com (C.A)

SEMESTER –VI   **PAPER – X**   **Total: 60 Hrs**

Syllabus   **E-COMMERCE**   **Max.Marks:70**

Credits 3   **NO Of Hours 5**   **Pass Marks 28**

Unit-I: Introduction to E-Commerce

Scope, Definition, e-Commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce. Business Strategy in an Electronic Age: Supply Chains, Porter's Value Chain Model, Inter Organizational Value Chains, Competitive Strategy, First Mover Advantage – Sustainable Competitive Advantage, Competitive Advantage using E-Commerce – Business Strategy.

Unit-II: Business-to-Business Electronic Commerce

Characteristics of B2B EC, Models of B2B EC, Procurement Management by using the Buyer's Internal Market place, Just in Time Delivery, Other B2B Models, Auctions and Services from traditional to Internet Based EDI, Integration with Back-end Information System, Role of Software Agents for B2B EC, Electronic marketing in B2B, Solutions of B2B EC, Managerial Issues, Electronic Data Interchange (EDI), EDI: Nuts and Bolts EDI and Business.

Unit-III: Internet and Extranet

Automotive Network Exchange, Largest Extranet, Architecture of the Internet, Intranet and Extranet, Intranet software, Applications of Intranets, intranet Application Case Studies, Considerations in Intranet Deployment, Extranets, Structures of Extranets, Extranet products and services, Applications of Extranets, Business Models of Extranet Applications, Managerial Issues. Electronic Payment Systems: Issues and Challenges .

Unit-IV: Public Policy:

From Legal Issues to Privacy : Legal Incidents, Ethical and Other public Policy Issues, Protecting Privacy, Protecting Intellectual Property, Free speech, Internet Indecency and Censorship, Taxation and Encryption Policies, Other Legal Issues: Contracts, Gambling and More, Consumer and Seller Protection in EC.

Unit-V: Infrastructure For EC

Network of Networks, Internet Protocols, Web- Based client/Server, Internet Security, Selling on the Web, Chatting on the Web, Multimedia delivery, Analyzing Web Visits, Managerial Issues, Equipment required for establishing EC Sites – problems in Operation – Future of EC.

Reference Books

1. David Whiteley, "E-Commerce", Tata McGraw Hill, 2000.
2. E Business by Parag Kulakarni and Sunitha Jahirabadkar from Oxford University Press.
3. E Business by Jonathan Reynolds from Oxford University Press.
4. Eframi Turban, Jae Lee, David King, K. Michael Chung, "Electronic Commerce",
5. Pearson Education, 2000.

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Title of the Paper: PHP & MySql   **Semester: IV**

Course Code	**CSC-607CE**	Course Delivery Method	Class Room / BlendedMode – 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 :2017-18	Year of Offering: 2021 - 22	Year of Revision: ----	Percentage ofRevision: 0%

Course Objectives:

To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.

Course Outcomes:

CO$_1$	Understand the benefits of a well-structured program
CO2	Understand different computer programming paradigms
CO3	Understand underlying principles of Object-Oriented Programming in Java
CO4	Develop problem-solving and programming skills using OOP concepts
CO5	Develop the ability to solve real-world problems through software development inhigh-level programming language like Java

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COMPUTER SCIENCE	CCSC-607CE	2021-22	B.Com (C.A)

SEMESTER –VI   **PAPER – XI**

Syllabus   PHP& MY SQL   Max.Marks:70

Credits 3   **NO Of Hours 5**   **Pass Marks 28**

Unit-I: 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: Defining Functions, Calling functions, returning the values from UserDefined Functions, Variable Scope, Saving State between Function calls with the Static statement, more about arguments.

Unit-II: Working with Arrays:
Arrays, Creating Arrays, Some Array-Related Functions. Working with Objects: Creating Objects, Object Instance. 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.

Unit-III: Working with Forms:
Creating Forms, Accessing Form – Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, Working with File Uploads. Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session Ids in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users.

Unit-IV: Working with Files and Directories:
Including Files with include(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories, Open Pipes to and from Process Using popen (), Running Commands with exec(), Running Commands with system ( ) or passthru ( ). Working with Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images, Image Creation from User Input.

Unit-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.

References:
1. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach Yourself, Pearson Education (2007).
2. Xue Bai Michael Ekedahl, The Web Warrior Guide to Web Programming, Thomson (2006).

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COMPUTER SCIENCE	CCSC-607CE	2021-22	B.Com (C.A)

SEMESTER –VI **PAPER – VI** **Total: 60 Hrs**

Lab List **PHP, MySQL** **Pass Marks 20**
No. of Hours per week: 2 **External: 25** **Internal: 25** **Credits: 2**

MySQL Lab Cycle
Cycle -1
An Enterprise wishes to maintain the details about his suppliers and other corresponding details. For that he uses the following details.
Suppliers (sid: Integer, sname: string, address: string)
Parts (pid: Integer, pname: string, color: string)
Catalog (sid: integer, pid: integer, cost: real)

The catalog relation lists the prices charged for parts by suppliers.
Write the following queries in SQL:
1. Find the pnames of parts for which there is some supplier.
2. Find the snames of suppliers who supply every part.
3. Find the snames of supplier who supply every red part.
4. Find the pnames of parts supplied by London Supplier abd by no one else.
5. Find the sid's of suppliers who charge more for some part than the average cost of that part.
6. For each part, find the sname of the supplier who charges the most for that part.
7. Find the sid's of suppliers who supply only red parts.
8. Find the sid's of suppliers who supply a red and a green part.
9. Find the sid's of suppliers who supply a red or green part.
10. Find the total amount has to pay for that supler by part located from London.

Cycle – 2

An organisation wishes to maintain the status about the working hours made by his employees. For that he uses the following tables.

Emp (eid: integer, ename: string, age: integer, salary: real)
Works (eid: integer, did: integer, pct_time: integer)
Dept (did: integer, budget: real, managerid: integer)
An employee can work in more than one department; the pct_time field of the works relation shows the percentage of time that a given employee works in a given department.

Resolve the following queries.

1. Print the names and ages of each employee who works in both Hardware and Software departments.

2. For each department with more than 20 full time equivalent employees (i.e., where the part-time and full-time employees add up to at least that many full-time employees), print the did's together with the number of employees that work in that department.

3. Print the name of each employee whose salary exceeds the budget of all of the departments that he or she work in.

4. Find the managerid's of managers who manage only departments with budgets greater than 1,000,000.

5. Find the enames of managers who manage the departments with largest budget.

6. If a manager manages more than one department, he or she controls the sum of all the budgets for those departments. Find the managerid's of managers who control more than 5,000,000.

7. Find the managerid's of managers who control the highest amount.

8. Find the average manager salary.

1. Write a PHP program to Display "Hello"
2. Write a PHP Program to display the today's date.
3. Write a PHP Program to read the employee details.
4. Write a PHP program to prepare the student marks list.
5. Write a PHP program to generate the multiplication of two matrices.
6. Write a PHP Application to perform demonstrate the college website.
7. Write a PHP application to add new Rows in a Table.
8. Write a PHP application to modify the Rows in a Table.
9. Write a PHP application to delete the Rows from a Table.
10. Write a PHP application to fetch the Rows in a Table.
11. Develop an PHP application to make following Operations
    i. Registration of Users.
    ii. Insert the details of the Users.
    iii. Modify the Details.
    iv. Transaction Maintenance.
        a) No of times Logged in
        b) Time Spent on each login.
        c) Restrict the user for three trials only.
        d) Delete the user if he spent more than 100 Hrs of tr

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DEPARTMENT OF COMPUTER SCIENCE (PG)

2021-22

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	COURSE CODE	L	T	P	C	Year
PROBLEM SOLVING USING PYTHON PROGRAMMING	20CS1T1	4	-	-	4	2020-21

Course Outcomes:

On successful completion of this course, the students:
1. Understand basics of Python Programming. (CO1)
2. Gain knowledge on *Decision Control Statements* and *Functions & Modules*. (CO2)
3. Be familiar with *Python Strings* and *Data Structures*. (CO3)
4. Have knowledge on *Classes & Objects.* (CO4)
5. Apply *Inheritance*, *Error and Exception Handling* and *Operator Overloading*. (CO5)

UNIT 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.

UNIT II

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.

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.

UNIT III

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.

UNIT IV

Classes and Objects: Classes and Objects, Class Method and self Argument, Class Variables and Object Variables, Public and Private Data Members, Private Methods, Calling a Class Method from Another Class Method, Built-in Class Attributes, Class Methods, Static Methods.

UNIT V

Inheritance: Inheriting Classes in Python, Types of Inheritance, Abstract Classes and Interfaces.
Error and Exception Handling: Introduction to Errors and Exceptions, Handling Exceptions, Raising Exceptions, Built-in and User defined Exceptions
Operator Overloading: Concept of Operator Overloading, Advantage of Operator Overloading, Implementing Operator Overloading.

Prescribed Text Book			
	Author	Title	Publisher
1	Reema Thareja	Python Programming Using Problem Solving Approach	Oxford University Press

Reference Text Book			
	Author	Title	Publisher
1	Wesley Chun	Core Python Programming	Prentice Hall

COURSE	COURSE CODE	L	T	P	C	Year
COMPUTER ORGANIZATION	20CS1T2	4	-	-	4	2020-21

Course Outcomes:

On successful completion of this course, the students:
1. Understand *Digital Logic Circuits*, *Digital Components and Data Representation*. (CO1)
2. Know *Register Transfer and Micro Operations* and *Basic Computer Organization and Design*. (CO2)
3. Be familiar with *Micro Programmed Control* and *Central Processing Unit*. (CO3)
4. Have knowledge on *Computer Arithmetic*. (CO4)
5. Understand *Input-Output Organization* & *Memory Organization*. (CO5)

UNIT I

Digital Logic Circuits: Digital Computers, Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Flip-Flops, Sequential Circuits.

Digital Components: Integrated Circuits, Decoders, Multiplexers, Registers, Shift Registers, Binary Counters, Memory Unit.

Data Representation: Data Types, Complements, Fixed-Point Representation, Floating-Point Representation, Other Binary Codes, Error Detection Codes.

UNIT II

Register Transfer and Micro Operations: Register Transfer Language, Register Transfer, Bus & Memory Transfers, Arithmetic Micro Operations, Logic Micro Operations, Shift Micro Operations, Arithmetic Logic Shift Unit.

Basic Computer Organization and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing & Control, Instruction Cycle, Memory-Reference Instructions, Input-Output Interrupt.

UNIT III

Micro Programmed Control: Control Memory, Address Sequencing, Micro Program Example, Design of Control Unit.

Central Processing Unit: General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control.

UNIT IV

Computer Arithmetic: Introduction, Addition and Subtraction, Multiplication Algorithm, Floating Point Arithmetic Operations, Decimal Arithmetic Unit, Decimal Arithmetic Operations.

UNIT V

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt.

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory.

Prescribed Text Book			
	Author	Title	Publisher
1	M.Morris Mano	Computer System Architecture	3rd Edition, Pearson Education (2008).

Reference Text Books			
	Author	Title	Publisher
1	V. Rajaraman, T. Radha Krishnan	Computer Organization and Architecture	PHI
2	Behrooz Parhami	Computer Architecture	Oxford (2007)
3	ISRD group	Computer Organization	Ace series, TMH (2007)
4	William Stallings	Computer Organization and Architecture – Designing for Performance	Pearson Education (2005)
5	P.Chakraborty	Computer Architecture and Organization	Jaico Books (2008)

COURSE	COURSE CODE	L	T	P	C	Year
SOFTWARE ENGINEERING	20CS1T3	4	-	-	4	2020-21

Course Outcomes:

On successful completion of this course, the students:
1. Understand various *Software Engineering Methods*, *Practices*, *Process Models* and *Agile Development Strategies*. (CO1)
2. Illustrate *Core Principles*, *Requirements & Modelling Concepts*. (CO2)
3. Identify different *Software Testing Approaches* and various aspects of *Software Quality Assurance*. (CO3)
4. Classify various *Process & Project Management Concepts*. (CO4)
5. Estimate *Software Projects* & apply *Formal Methods Modelling*. (CO5)

UNIT I

Software and Software Engineering: The Nature of Software: Defining Software, Software Application Domains, Legacy Software, The Unique Nature of WebApps, 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), Agile Unified Process (AUP).

UNIT 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, Swimlane 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.

UNIT 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 WebApps, 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,

UNIT 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, WebApp Project Metrics, Metrics for Software Quality: Measuring Quality, Defect Removal Efficiency.

UNIT 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.

COURSE	COURSE CODE	L	T	P	C	Year
DATABASE MANAGEMENT SYSTEMS	20CS1T4	4	-	-	4	2020-21

Course Outcomes:

On successful completion of this course, the students:
1. Understands the *Concepts & Architecture* of Databases. (CO1)
2. Able to apply simple and complex *SQL Queries & Relational Algebra & Relational Calculus* operations. (CO2)
3. Gain knowledge on *ER*, *EER Schemas & Normalization*. (CO3)
4. Understands *Disk Storage Organization*, *Hashing & Indexing*. (CO4)
5. Be aware of *Transaction Processing*, *Concurrency Control* and *Distributed Databases*. (CO5)

UNIT I

Databases and Database Users: Introduction, An Example, Characteristics of the Database Approach, Actors on the Scene, Workers behind the Scene, Advantage of Using the DBMS Approach.

Database System Concepts and Architecture: Data Models, Schemas, and Instances, Three-Schema Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment, Centralized and Client/Server Architectures for DBMSs.

The Relational Data Model and Relational Database Constraints: Relational Model Concepts, Relational Model Constraints and Relational Database Schemas, Update Operations, Transactions, and Dealing with Constraint Violations.

UNIT II

Basic SQL: SQL Data Definition and Data Types, Specifying Constraints in SQL, Basic Retrieval Queries in SQL, INSERT, DELETE, and UPDATE Statements in SQL.

More SQL: More Complex SQL Retrieval Queries, Views (Virtual Tables) in SQL, Schema Change Statements in SQL.

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 of Queries in Relational Algebra, The Tuple Relational Calculus, The Domain Relational Calculus.

UNIT III

Data Modeling Using the Entity-Relationship (ER) Model: Using High-Level Conceptual Data Models for Database Design, Entity Types, Entity Sets, Attributes, Keys, Relationship Types, Relationship Sets, Roles, Structural Constraints, Weak Entity Types, ER Diagrams, Naming Conventions,DesignIssues.

The Enhanced Entity-Relationship (EER) Model: Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and Characteristics of Specialization and Generalization Hierarchies, Modeling of UNION Types Using Categories, A Sample UNIVERSITY EER Schema, Design Choices, Formal Definitions.

Functional Dependencies: Introduction, Basic Definitions, Trivial and Non-Trivial Dependencies, Closure of set of Dependencies, Closure of set of Attributes, Irreducible sets of dependencies.

Further Normalization 1NF, 2NF, 3NF, BCNF: Introduction, Nonloss decomposition and functional dependencies, 1st, 2nd and 3rd normal forms, Boyce-Codd Normal Form. Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal.

UNIT IV

Disk Storage, Basic File Structures and Hashing: Secondary Storage Devices, Buffering of Blocks, Placing File Records on Disk, Operations on Files, Files of Unordered Records (Heap Files), Files of Ordered Records (Sorted Files), Hashing Techniques, Parallelizing Disk Access Using RAID Technology.

Indexing Structures for Files: Types of Single-Level Ordered Indexes, Multilevel Indexes, Dynamic Multilevel Indexes Using B-Trees and B^+-Trees.

UNIT V

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, Transaction Support in SQL.

Concurrency Control Techniques: Two-Phase Locking Techniques for Concurrency Control, Concurrency Control Based on Timestamp Ordering, Multiversion Concurrency Control Techniques, Validation (Optimistic) Concurrency Control Techniques, Granularity of Data Items and Multiple Granularity Locking, Using Locks for Concurrency Control in Indexes.

Distributed Databases: Distributed Database Concepts, Types of Distributed Database Systems, Distributed Database Architectures, Data Fragmentation, Replication and Allocation Techniques for Distributed Database Design.

COURSE	COURSE CODE	L	T	P	C	Year
THEORY OF COMPUTATION	20CS1T5	4	-	-	4	2020-21

Course Outcomes:

On successful completion of this course, the students:
1. Understand *Fundamentals of Automata* and *Finite Automata*. (CO1)
2. Able to apply *Regular Languages*. (CO2)
3. Gain knowledge on *Grammar Formalism* and *Context Free Grammars*. (CO3)
4. Design *Pushdown Automata*. (CO4)
5. Understand *Turing Machine* and *Computability Theory*. (CO5)

UNIT I

Fundamentals: Strings, Alphabet, Language, Operations, Finite Automaton Model, Acceptance of Strings and Languages, FA, Transition Diagrams and Language Recognizers.

Finite Automata: Deterministic Finite Automaton, Non Deterministic Finite Automaton (Simple Problems), Differences between NFA and DFA, NFA with ε Transitions- *Significance of NFA with Epsilon , Acceptance of Language*, Conversions and Equivalence-*Conversion from NFA with ε to NFA without ε, NFA to DFA Conversion, NFA with ε to DFA*, Minimization of FSM, Equivalence between two FSMs, Equivalence of Moore and Mealy Machines.

UNIT II

Regular Languages: Regular Sets, Regular Expressions, Identity Rules for Regular Expression, Conversion of Finite Automata (DFA) to Regular Expressions - *using State Elimination Method and Arden's Theorem*, Conversion of Regular Expression to ε-NFA, Pumping Lemma of Regular Languages (Sets) (Proofs Not Required).

UNIT III

Grammar Formalism: Regular Grammars - *Right Linear and Left Linear Grammars*, Inter Conversion- *Conversion of a Regular Grammar for a given Finite Automata, Construct FA from Regular Grammar,* Context Free Grammar, Derivation Trees, Sentential Forms, Right most and Leftmost Derivation of Strings.

Context Free Grammars: Ambiguity in Context Free Grammars. Minimization of Context Free Grammars. Chomsky Normal Form, Greibach Normal Form, Pumping Lemma for Context Free Languages, Enumeration Properties of CFL (Proofs Not Required), Simple Problems.

UNIT IV

Push Down Automata: Definition, Model, Design of PDA, Acceptance by Final State and Acceptance by Empty Stack, Inter Conversion - *Construct PDA Equivalent to a given CFL, Construct CFL Equivalent to a given PDA* (Proofs Not Required).

UNIT V

Turing Machine: Definition, Model, Design of TM, Recursively Enumerable Languages and its Properties and Recursive Languages, Types of Turning Machines: Simple Problems.

Computability Theory: Chomsky Hierarchy of Languages: *Regular Grammars, Unrestricted Grammars, Context Sensitive Languages*, Decidability of Problems: *Properties of Recursive and Recursively Enumerable Languages*, Universal Turing Machine**,** Undecidability of Posts Correspondence Problem, Definition of NP Complete and NP Hard Problems.

Prescribed Text Book			
	Author	Title	Publisher
1	Hopcroft H.E. and Ullman	Introduction to Automata Theory Languages and Computation	J. D. Pearson Education

Reference Text Books			
	Author	Title	Publisher
1	John C Martin	Introduction to languages and the Theory of Computation	TMH
2	A.A Putumbekar	Formal Languages and Automata Theory	Technical Publications
3	Lewis H.P. & Papadimitriou C.H	Elements of Theory of Computation	Pearson PHI
4	Mishra and Chandrashekaran	Theory of Computer Science and Automata Languages and Computation	2nd edition, PHI.
5	Daniel I.A. Cohen	Introduction to Computer Theory	John Wiley

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Programme: M.Sc.(Computer Science)

Title of the Paper: Internet of Things

Semester: III

Course Code	20CS3T1	Course Delivery Method	Class Room / Blended Mode
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 :2021-22	Year of Offering:2021-22	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

Course Details

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/

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Programme: M.Sc.(Computer Science)

Title of the Paper: Cryptography & Network Security

Semester: III

Course Code	20CS3T2	Course Delivery Method	Class Room / Blended Mode
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 : 2021-22	Year of Offering: 2021-22	Year of Revision: 2021-22	Percentage of Revision: 10

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-Key Crypto 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

Course Details

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 SecurityAssociations.	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

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Programme: M.Sc.(Computer Science)

Title of the Paper: Design & Analysis of Algorithms

Semester: III

Course Code	20CS3T3	Course Delivery Method	Class Room / Blended Mode
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 : 2021-22	Year of Offering: 2021-22	Year of Revision: 2021-22	Percentage of Revision:Nil

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 various Problems.

CO4 : Understand *Backtracking* and *Branch and Bound* Techniques to Design Algorithms.

CO5 : Categorize *NP-Hard* and *NP-Complete* Problems.

Syllabus

Course Details

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, Graph Coloring, Hamiltonian Cycles, Knapsack Problem. **Branch and Bound :** The Method: Least Cost Search, The 15 Puzzle Control Abstractions for 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, Traveling Sales 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)

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Programme: M.Sc. (Computer Science)
Title of the Paper: Data Mining Techniques
Semester: III

Course Code	20CS3T4	Course Delivery Method	Class Room / Blended Mode
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 : 2021-22	Year of Offering: 2021-22	Year of Revision: 2021-22	Percentage of Revision:Nil

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

Course Details

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 in Algorithmic 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

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Programme:

Title of the Paper: Visual Analytics for Executives

Semester: III

Course Code	21CS3OEL1	Course Delivery Method	Face-to-face/Blended Mode
Course Category	Open elective	Lecture-Tutorial-Practice	2-0-4
Credits	4	CIA Marks	30
No. of Lecture Hours / Week	6	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction : 2021-22	Year of Offering: 2021-22	Year of Revision: 2021-22	Percentage of Revision: Nil

Course Objectives : This Course focuses to know the *Importance of Visualization in the world of Data Analytics and Prediction, To handle Data Sources in Tableau*, To get familiarized about creating visualization using different *Types of Charts*, To gain knowledge about using *Maps in Tableau*, To gain knowledge about *Analysis*, To design *Interactive Dash Boards*.

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

CO1 : Able to know the importance of *Visualization* and connect *Different Data Sources in Tableau*.

CO2 : Able to create *Charts* in *Tableau*.

CO3 : Able to implement *Aggregate Functions*, *Calculated Fields*, *Table Calculations* and *Level of Detail Calculations*.

CO4 : Able to implement *Maps* and *Advance Analytic.*

CO5 : Able to create *Interactive Dash Boards*.

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	**Introduction and Getting Started with Tableau:** The Advantages of a Modern Analytics Platform, The Tableau Application Suite, Installing Tableau Desktop Data Preparation, The Sample Dataset, The Tableau Workspace, Working With Measures and Dimensions. Working With Marks, Saving, Opening, And Sharing Your Workbooks. **Adding Data Sources in Tableau:** Setting up a Data Connector, Selecting Data Tables, Joins, Unions, Data Extracts and Live Connections, Editing The Model's Metadata, Data Types, Adding Hierarchies, Calculated Fields and Table, Calculations, Data Collection.	12
II	**Creating Data Visualizations:** Chart Types, Ready, Set, Show Me, Bar Charts, Legends, Filters and Hierarchies,, Line Charts, Highlight Tables, Heatmaps, Bullet Charts, Cumulative Sums With Waterfall Charts, Reflection, The Anatomy of A Tableau Visualization.	12
III	**Aggregate Functions, Calculated Fields, and Parameters:** Aggregate Functions, Calculated Fields, Aggregations in Calculated Fields, Text Operators, Date Fields, Logical Functions In Calculated Fields, Parameters, Searching Text Fields. **Table Calculations and Level of Detail Calculations:** Different Types of Calculations, Quick Table Calculations, Customized Table Calculations, Level of Detail Expressions.	12
IV	**Maps:** Symbol Maps, Filled Maps, Density Maps, Map Layers, Maps With Pie Charts, Viz in Tooltip. **Reflection:** The Anatomy of a Tableau Map, Alternative Map Services, Mapbox Maps, Spatial Data. **Advanced Analytics**: Trends, Forecasts, Clusters and Other Statistical Tools, Overview of The Tableau Analytics Pane, Constant, Average, Reference Lines, Trend Lines, Forecasts, Cluster Analysis.	12
V	**Interactive Dashboards:** Preliminary Considerations, Creating a New Dashboard, The Dashboard Pane, Placing Charts on the Dashboard, Dashboard Titles, Navigation Buttons, Dashboard Actions.	12

Course has focus on : Employability

Websites of Interest :
1. Visual Analytics in Tableau | https://www.youtube.com/watch?v=gEKQ3kigJsM
2. Tableau Training for Beginners | Edureka https://www.youtube.com/watch?v=aHaOIvR00So
3. Tableau Training for Beginners | Simplilearn https://www.youtube.com/watch?v=Wh4sCCZjOwo
4. Tableau Full Course| https://youtu.be/KA0QHWm0nWo

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

Lab List:

1. Tableau installation. (BTL1)

2. Tableau Introduction /Exploring Tableau. (BTL1)

3. Creating New Workbooks Opening Existing Workbooks in Tableau(BTL3)

4. Data Collection from various sources web/text/csv/JSON (BTL3)

5. Implementing joins and Unions (BTL3)

6. Creating Bar Chart. (BTL3)

7. Creating Pie Chart. (BTL3)

8. Creating Dual Axis Chart. (BTL3)

9. Creating Shared Axis. (BTL3)

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Programme:

Title of the Paper: Web Programming

Semester: III

Course Code	21CS3OEL2	Course Delivery Method	Class Room / Blended Mode
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 : 2021-22	Year of Offering: 2021-22	Year of Revision: 2021-22	Percentage of Revision: 0%

Course Objective: To provide knowledge on *Web Architecture*, *Web Services*, *Client Side* and *Server Side Scripting Technologies,* To focus on the development of *Web Based Information Systems* and *Web Services*, To provide skills to design *Interactive* and *Dynamic Web Sites*.

Course Outcomes: On successful completion of the course student will be able to:

CO1: Understand the *Web Architecture* and *Web Services*.

CO2: Design *Interactive Web Pages* using HTML and *Style Sheets*.

CO3: Design *Interactive Web Pages* using Forms and *Tables*.

CO4: Study about *CSS* and *XML*.

CO5: Create a *Website* using *Wix Platform*.

<div align="center">Syllabus</div>

Course Details

Unit	Learning Units	Lecture Hours
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. **Internet Protocols:** Internet Protocols, Host Names, Internet Applications And Application Protocols, Email Protocols**.** **World Wide Web:** Basics of WWW and Browsing, URL, Types of Browsers, Features of Browsers.	12

II	**Introduction to HTML:** HTML Document Structure, Creating Headings on Webpage. **Working with Links:** Creating Hyper Link, Setting The Hyper Link Colors, Linking Different Sections of Web Page. **Working with images:** Inserting an Image, Displaying alternate Text for an Image, Adding a Border, Aligning an Image, Using Image as Links, Image Maps. **Working with tables**: Creating a Table, Specifying Caption to a Table, Adding a Table Heading and Border, Aligning a Table and Cell Content, Setting The Width of a Table And Table Columns.	12
III	**Forms:** Creating Forms, Named Input Fields, The <INPUT> Tag, Multiple Lines Text Windows, Drop Down and List Boxes, Text, Text Area, Password, Button, Submit, Reset, Radio, Checkbox, Select Option, Labeling Input Fields, Grouping Related Fields, Disabled and Read Only Fields. **Frames:** Introduction to Frames, Frames Document, The <FRAMESET> Tag, Nesting <FRAMESET> Tag, Placing Content in Frames with the <FRAME> Tag, Targeting Named Frames.	12
IV	**CSS:** Introduction to Style Sheets, Inline Styles, External Style Sheets, Internal Style Sheets, Style Classes, Multiple Styles. **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.	12
V	**Make a Website with Wix:** Planning your Wix Website Design, Planning your Website Pages Working, Planning your Website Pictures, Videos and Logos, Wix Signup and Selecting a Premade or Blank Template. **Building Your Wix Website**: Getting to know Wix platform, Getting to know Wix editor, Designing the Header, Footer and Menu, Background for Pages and Sections, Adding Text, Adding Photos, Adding Videos, Adding Icons, Shapes and Boxes, Adding Links, Adding Forms, Adding a Wix Store, Adding a Lightbox.	12

Prescribed Textbook			
	Author	Title	Publisher
1	N.P.Gopalan, J.Akilandeswari	Web Technologies-A Developer‟s Perspective	PHI(2008)

Reference Text Book			
	Author	Title	Publisher
1	Harvey M. Deitel and Paul 1. Deitel	Internet and World Wide Web How To Program, 5e	Prentice Hall; 4th edition
2	Thomas Powell	Web Design The Complete Reference	TMH Tata McGraw Hill

Course Focus: Employability

Websites of Interest:
1. https://www.w3schools.com/html/default.asp
2. https:www.udemy.com/course/wix-master-course-make-a-website-in-1-day-with-wix

Course	COMPUTER NETWORKS		
Course Code	20CS2T1	Course Delivery Method	Class Room / Blended Mode
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%

1.   Course Outcomes:

At the end of this course students will be able to:

1. Understand functionality of *Layered Network Architecture*, Different types of *Transmission Media*. (CO1)
2. Understand various *Networks* and their functions.(CO2)
3. Understand the *IPAddresses*and various*RoutingAlgorithms*usedininternetworking.(CO3)
4. Understand different *Transport Layer Protocols*.(CO4)
5. Understand the various *Application Layer Protocols* and *Security Issues* over internet.(CO5)

Unit	Learning Units	Lecture Hours
I	**Introduction:** Uses of Computer Networks: Business Application, Home Applications, Mobile Users, Social Issues,. *Network Hardware***:** Local Area Networks, Metropolitan Area Networks, Wide Area Networks, Wireless Networks, Home Networks, Internetworks. *Network Software***:** Protocol Hierarchies, Design Issues for the Layers, 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, A Critique of the OSI Model and Protocols, A Critique of the TCP/IP reference model, *Example Networks***:** The Internet, The Third Generation Mobile Phone Networks, Wireless LANs, RFID and Sensor Networks. **Physical Layer:** *Guided Transmission Media***:** Magnetic Media, Twisted Pair, Coaxial Cable, power lines, Fiber Optics	14
II	**Data Link Layer:** *Data Link Layer Design Issues*: Services Provided to the Network Layer, Framing, Error Control, and 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. **The Medium Access Control Sub Layer:** *Ethernet*: Ethernet Cabling, Manchester	14

	Encoding, The Ethernet MAC sub layer Protocol, The Binary Exponential Back off Algorithm, Ethernet Performance, Switched Ethernet, Fast Ethernet, Gigabit Ethernet,10-bit Gigabit Ethernet. Wireless Lans: The 802.11 Protocol Stack, The 802.11 Physical Layer, The 802.11 MAC Sub Layer Protocol, The 802.11Frame Structure, 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,RoutersandGateways,VirtualLANs.	
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. *Internet Working***:** How Networks Differ, How Networks can be connected, Concatenated Virtual Circuits, Connectionless Internetworking, Tunneling, Internetwork Routing, Packet Fragmentation**.** *The Network Layer in the Internet***:** The IPVersion4Protocol, IP address, Internet Control Protocols, OSPF, The Internet Gateway Routing Protocol, BGP, The Exterior Gateway Routing Protocol.	10
IV	**The Transport Layer:** *The Transport Service***:** Services provided to the Upper Layers, Transport Services Primitives, and Berkeley Sockets. *Elements of Transport Protocols*: Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing. *The Internet Transport Protocols***:** Introduction to UDP: Remote Procedure Call, The Real Time Transport Protocol. **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 TCP Connection Management, TCP Sliding Window, TCP Congestion Control, TCP Timer Management, Future of TCP.	10
V	**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 and Web Applications**. HTTP**-The Hyper Text Transfer Protocol. *Streaming Audio and Video*: Digital Audio, Digital Video, Streaming Stored Media, Streaming Live Media, Real Time Conferencing. *Network Security***:** Introduction to Cryptography, Public Key Algorithms-RSA.	12

Prescribed Text Book

	Author	Title	Publisher
1	Andrews.T anenbaum	Computer Networks	Fifth Edition, Pearson **Chapters:**1.1to1.5,2.2,3.1to3.4,4.3, 4.4,4.6,4.85.1,5.2.1to5.2.8,5.5,5.6.1 to5.6.4,5.6.6,5.6.7,6.1.1to6.1.3,6.2.1t o6.2.5,6.4,6.5,7.1,7.2,7.3.1to7.3.4, 7.4.1to7.4.5,8.1.1,8.3.1

Reference Text Book

1	Behrouz AForouzan,Firouz	Computer Networks A Top Down Approach	McGraw hill Education (India) Special Indian Edition

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(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (Computer Science) Programme - II Semester

Course	DATASTRUCTURES		
Course Code	20CS2T2	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:

1. Todefinedatastructures,operationofdatastructure,timeandspacecomplexities.(CO1)
2. To understand concepts of string processing, arrays, records and pointers, linked lists, stacks, queues, recursion, trees, graphs & searching techniques. about searching and sorting techniques.(CO2)
3. Toimplementapplicationsoflinkedlists,stacks,queues,trees,graphs,sorting&searchingtechniques.(CO)
4. To analyze applications of linked lists, stacks, queues, trees, graphs, sorting & searching techniques.(CO4)
5. To evaluate applications of linked lists, stacks, queues, trees, graphs, sorting & searching techniques in terms of time & space complexity.(CO5)

Unit	Title	Lecture Hours
I	**Introduction and Overview:** Elementary Data Organization, Data Structures, Data Structure operations, Algorithms: Complexity, Time-Space Trade off. **Preliminaries:** Mathematical Notation and Functions, Algorithmic Notation, Control Structures, Complexity of Algorithms, Other Asymptotic Notations, Sub Algorithms, Variables, Data Types.	14
II	**String Processing:** Storing Strings, Character Data Type, String Operations, Word Processing, Pattern Matching Algorithms. **Arrays, Records and Pointers:** Linear Arrays, Representation and Traversing Linear Arrays, Inserting and Deleting, Bubble Sort, Linear Search, Binary Search, Multidimensional Arrays, Pointer Arrays, Record Structures, Representation of records in memory, Parallel Arrays, Matrices, Sparse Matrices.	14
III	**Linked Lists:** Representation, Traversing, Searching, Memory Allocation: Garbage Collection, Insertion, Deletion, Header Linked Lists, Two-Way Lists. **Stacks, Queues, Recursion:** Stacks, Array representation, Linked List representation, Arithmetic Expressions; Polish notation, Quick Sort, Recursion, Towers of Hanoi, Implementation of recursive procedures by stacks, Queues, Linked representation of Queues, De-queues, Priority Queues.	14

IV	**Trees:** Binary Trees, Representing and Traversing Binary trees, Traversal Algorithms Using Stacks, Header Nodes, Binary Search Trees, Searching, Insertion and deletion in Binary Search Trees, AVL Search Trees, Insertion and Deletion in AVL Search Trees, M-way Search Trees, Searching, Insertion and Deletion in M-way Search Trees, B-Trees, Searching, Insertion and Deletion in B-Trees, Heap: Heap Sort, Huffman's Algorithms, General Trees.	14
V	**Graphs:** Terminology, Sequential representation of Graphs, Warshall's Algorithm, Linked Representation of Graphs, Operations on Graphs, Traversing a Graph, Topological sorting. **Sorting and Searching:** Insertion Sort, Selection Sort, Merging, Merge Sort, Radix Sort, Searching and Data Modification, Hashing.	14

Prescribed Text Book

	Author	Title	Publisher
1	Seymour Lip schutz	Data Structures	The Mc Graw Hill(Schaum'sOutlines), 2011

Reference Text Books

	Author	Title	Publisher
1	Seymour Lipschutz	Theory and Problems of Data Structures	The Mc GrawHill(Schaum's Outlines)
2	Aho, Hopcroft & Ullman	Data Structures & Algorithms	Addison-Wesley
3	M.A.Weiss	Data Structures &Algorithms in C	Addison Wesley

Course	WEB TECHNOLOGIES		
Course Code	20CS2T3	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-	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision:

Course Outcomes:

On successful completion of this course, the students:

1. Students are able to describe the concepts of WWW including browser and HTTP protocol and various HTML tags and use them to develop the user friendly WebPages.(CO1)
2. Students will be able to use the Java Script and VBScript to develop the dynamic WebPages.(CO2)
3. StudentswillbeabletodefinetheCSSwithitstypesanddevelopthemodernwebpagesusingtheHTMLandXMLelementswithdifferentlayoutsasperneedofapplications.(CO3)
4. StudentsuseserversidescriptingwithPHPtogeneratethewebpagesdynamically using the database connectivity.(CO4)
5. DevelopthemodernWebapplicationsusingtheclientandserversidetechnologiesandthewebdesignfundamentals.(CO5)

Unit	Learning Units	Lecture Hours
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 theWebWorks?,WebBrowsers,SearchinginformationontheWeb,InternetStandards. **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
II	**Java Script:** Introduction to Scripting, Control Statements I, Control Statements II, Functions, Arrays, Objects, Document Object Model, Events. **VB Script:** Introduction, Embedded VBScript code in an HTML Document, Comments, Variables,ArrayVariables,Operator,AssignmentOperators,NumericalOperators,StringConcatenation,Procedures, Sub Procedure, Function Procedure, Conditional Statements, Looping Statements, Object and VB script, Cookies, Cookie Variables, Creating a Cookie, A Cookie with Multiple Values, Reading Cookie Value.	12

III	**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. **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 building 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, XSL Name Spaces, XML Schema.	12	

IV	**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. **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.	12
V	**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. **Active Server Pages (ASP):** Introduction, Advantages of ASP, First ASP Script, Processing ASP Scripts with Forms, Variables and Constructs, Subroutines, Include/Virtual, ASP Cookies, ASP Objects, Connecting to Data with ASP.	12

Prescribed Text Book

	Author	Title	Publisher
1	N.P.Gopalan, J.Akilandeswari	Web Technologies-A Developer's Perspective	PHI(2008)
2	HarveyM.DeitelandPaul1.Deitel	InternetandWorldWideWebHo wToProgram,5e	PrenticeHall;4the dition

Reference books

1	Robert W.Sebesta	Programming the world wide web.	Third Edition,
2	Anders Moller and Michaelschwarzbach	An Introduction to XML and web Technologies.	Addison Wesley (2006)

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	OPERATINGSYSTEMS		
Course Code	20CS2T4	Course Delivery Method	Class Room / Blended Mode
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:

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:** What Operating Systems Do Computer System Organization, Computer System Architecture, Operating System Structure, Operating System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Kernel Data Structures, Computing Environments, and Open Source Operating Systems? **Operating-System Structures:** Operating System Services, User and Operating System Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, Operating System Structure. **Processes:** Process Concept, Process Scheduling, Operations on Processes, Inter Process Communication, Communication in Client-Server Systems.	12
II	**Threads:** Overview, Multi core Programming, Multithreading Models, Thread Libraries, Implicit Threading, and 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.	10

III	**Deadlocks:** System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. **Main Memory:** Swapping, Contiguous Memory Allocation, Segmentation, Paging, Structure of the Page Table, Intel32 and 64-bit Architectures. **Virtual Memory:** Background, Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing.	14	
IV	**Mass Storage Structure:** Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Swap Space Management, RAID Structure. **File System Interface**: File Concept, Access Methods, Directory and Disk Structure, File System Mounting Protection. **File System Implementation**: File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free Space Management Efficiency and Performance Recovery.	10	
V	**I/O Systems:** Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O Requests to Hardware Operations, STREAMS, Performance. **Protection:** Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of the Access Matrix. **Security:** The Security Problem, Program Threats, System and Network Threats, Cryptography as a Security Tool, User Authentication, Firewalling to Protect Systems and Networks.	14	

Prescribed Text Book

	Author	Title	Publisher	
1	Abraham Silbers chatz,	Operating Concepts	System	

Reference Text Books

	Author	Title	Publisher	
1	William Stallings	Operating Systems-Internals and Design Principles	Fifth(2007)	
2	Achyut God bole	Operating Systems	Operating Systems	
3	Flynn/McHoes	Operating Systems	Cengage Learning (2008).	

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Open Elective-II Semester

COURSE	COURSE CODE	L	T	P	C	Year
DATAVISUALIZATION	20CS2OEL1	4	-	-	4	2020-21

Course Outcomes:

After completion of the course the student will be able:

- To know the importance of *Data Visualization* in the world of *Data Analytics* and *Prediction*.
- Togetfamiliarizedaboutcreatingvisualizationusing*DifferentTypes*of*Charts*.
- To know creating and handling *Tables* in Tableau.
- To gain knowledge about using *Maps* in Tableau
- To gain knowledge about *Adhoc Analysis*.

UNIT I:
Creating Visual Analytics with Tableau Desktop, Connecting to Your Data - How To Connect To Your Data, What Are Generated Values?, Knowing When to use a Direct Connection, Joining Tables With Tableau, Blending Different Data Sources in a Single Worksheet.

UNIT II:
Building Your First Visualization-How Me Works-Chart Types, Text Tables, Maps, Bar Chart, Line Charts, Area Fill Charts and Pie Charts, Scatter Plot, Bullet Graph, Gantt Charts, Sorting Data In Tableau, Enhancing Views With Filters, Sets Groups and Hierarchies.

UNIT III:
Creating Calculations to enhance Your Data - What is Aggregation, What are Calculated Values and Table Calculations, Using the Calculation Dialog Box to Create, Building Formulas Using Table Calculations, Using Table Calculation Functions.

UNIT IV:
Using Maps to Improve Insights - Create a Standard Map View, Plotting Your Own Locations on a Map, Replace Tableau's Standard Maps, and Shaping Data to enable Point-to-Point Mapping.

UNIT V:
Developing an Adhoc Analysis Environment - Generating New Data with Forecasts, Providing Self Evidence Adhoc Analysis with Parameters, Editing Views in Tableau Server.

Prescribed Text Book			
	Author	Title	Publisher
1	DanielG.MurrayandtheInter Works BI Team	Tableau Your Data	Wiley Publications

Reference Text Books			
	Author	Title	Publisher
1	Ashutosh Nandeshwar	Tableau Data Visualizaton Cookbook	PACKT Publishing
2	Cole Nussbaumer ,Knaflic	Storytelling with Data : A Data Visualization Guide for Business Professionals	Wiley Publishing

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	MOOCS		
Course Code	21MCS401	Course Delivery Method	Class Room / Blended Mode
Credits	4	CIA Marks	30
No. of Lecture Hours /Week	4	Semester End Exam Marks	70
Total No.of Lecture Hours	-	Total Marks	100
Year of Introduction:2020-21	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

COURSE OUTCOMES

CO1: To introduce the concept of PHP and to give basic Knowledge of PHP.
CO2: Learn about PHP Syntax., Arrays, PHP Loops,
CO3: Understood the PHP form handling.
CO4: Understand Working with Files and Directories:
Co5: Understand basic concepts of MySql and PHPMyAdmin, how a database stores information via tables, Understanding of SQL syntax used with MySQL,Review of some sample PHP projects interacting with MySql

MODULE 1 Installing and Configuring MySQL: **10 Hrs**
Current and Future Versions of MySQL, How to Get MySQL, Installing MySQL on Windows, Trouble Shooting your Installation, Basic Security Guidelines, Introducing MySQL Privilege System, Working with User Privileges. Installing and Configuring Apache:Current and future versions of Apache, Installing Apache on Windows, Apache Configuration File Structure, Apache Log Files, Apache Related Commands, Trouble Shooting. Installing and Configuring PHP: Building PHP with Apache on Windows, The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Flow Control Functions in PHP: Switching Flow Loops.

MODULE 2 – Working with Functions and Arrays: **10 Hrs**
Calling functions, Defining Functions, Returning the values from User-Defined Functions, Variable Scope. Working with Arrays: Creating Arrays, Some Array-Related Functions. Working with Objects: Creating Objects, Object Instance Working with Strings, Dates and Time: Formatting Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

MODULE – 3 Working with Forms: **15Hrs**
Creating Forms, Accessing Form – Input with User defined Arrays, Combining HTML and PHP code on a single Page, Sending Mail on Form Submission, Working with File Uploads. Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session Ids in the Query String, Destroying Sessions and Unsetting Variables

MODULE – 4 : Working with Files and Directories: **10Hrs**
Including Files with include(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories, Open Pipes to and from Process Using popen (), Running Commands with exec(), Running Commands with system ( ) or passthru ( ). Working with Images: Understanding the Image-Creation Process, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images, Image Creation from User Input.

MODULE – 5 : Interacting with MySQL using PHP: **15 Hrs**
Introduction to My SQL and Interfacing with Databases through PHP understanding thedatabase design process: The Importance of Good Database Design, Types of TableRelationships, Normalization. Learning basic SQL Commands: Learningthe MySQL Data types, Learning the Table Creation Syntax, Using Insert Command,Using SELECT Command, Using WHERE in your Queries, Selecting from MultipleTables, Using the UPDATE command to modify records, Using RELACE Command,Using the DELETE Command, Frequently used string functions in MySQL, UsingDate and Time Functions in MySQL. Interacting with MySQL using PHP: MySQLVersus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data.

References:
1. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach yourself, PearsonEducation (2007).
2. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson(2006)

Course	BIG DATA AND ANALYTICS		
Course Code	21MCS402	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: 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 Jasper soft. (CO5)

Unit	Learning Units	LH
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:** No-SQL, Hadoop, Why Hadoop?, Why not RDBMS?, RDBMS versus Hadoop, Hadoop Overview, HDFS, Processing Data with Hadoop, Interacting with Hadoop Ecosystem.	14
IV	**Introduction to Mongo DB:** What is Mongo DB?, Why Mongo DB?, Terms used in RDBMS and Mongo DB, Data types in Mongo DB, Mongo DB query language. **Introduction to Map reduce programming:** Introduction, Mapper, Reducer, Combiner, Practitioner, 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 Functions, Parameter Substitution, Word Count Example using Pig. **Jasper Report using Jasper soft:** Introduction to Jasper Reports, Connecting to Mongo DB No-SQL Database.	14

Prescribed Text Book

	Author	Title	Publisher
1	Seema Acharya and Subhashini Chellappan	Big Data and Analytics	Wiley India Pvt. Ltd., 2016

(An Autonomous College in the jurisdiction of Krishna University)
M.Sc., (Computer Science) Programme - IV Semester

Course	ARTIFICIAL INTELLIGENCE WITH MACHINE LEARNING		
Course Code	21MCS403	Course Delivery Method	Class Room / Blended Mode
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:2021-22	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

Course Outcomes:

1. Identify problems that are amenable to AI techniques and analyse search techniques to solve thoseproblems.
2. Awareness of representation languages like first order logic.
3. Formalize and implement different AI algorithms, various Knowledge Representations and identify the importance of planning to solve AI problems.
4. Understands about basics of machine learning and conceptual learning.
5. To acquire knowledge about ANN and Instance based learning**.**

Unit	Learning Units	Lecture Hours
I	**Introduction:** What Is AI? The Foundations of Artificial Intelligence, The History of ArtificialIntelligence. **Solving Problems by Searching:** Problem Solving Agents, Example Problems, Searching for Solutions, Uninformed Search Strategies, Informed (Heuristic) Search Strategies, Heuristic Functions.	12
II	**First Order Logic:** Representation Revisited, Syntax and Semantics of First Order Logic, Using FirstOrder Logic, Knowledge Engineering in First Order Logic. **Inference in First Order Logic:** Propositional versus First Order Inference, Unification and Lifting,Forward Chaining, Backward Chaining, Resolution.	10

III	**Classical Planning:** Definition of Classical Planning ,Algorithms for Planning as State Space Search, Planning Graphs, Other Classical Planning Approaches, Analysis of Planning Approaches. **Knowledge Representation:** Ontological Engineering, Categories and Objects Events, Mental Eventsand Mental Objects.	14
IV	**Learning from Examples:** Forms of Learning, Supervised Learning ,Learning Decision Trees, Evaluating and Choosing the Best Hypothesis, The Theory of Learning, Regression and Classificationwith Linear Models. **Reinforcement Learning:** Introduction, Passive Reinforcement Learning, Active Reinforcement Learning, Generalization in Reinforcement Learning, Policy Search, Applications of Reinforcement Learning.	10
V	**Artificial Neural Networks:** Neural Network Representation, Appropriate Problems for Neural Network Learning, Perceptrons, Multilayer Networks and the Back Propagation Algorithm, Remarks on the Back Propagation Algorithm, Recurrent Networks, Dynamically Modifying Network Structure. **Instance Based Learning:** Introduction**,** K-Nearest Neighbour Learning, Locally WeightedRegression, Radial Basis Functions, Case Based Reasoning.	14

Prescribed Text Book

	Author	Title	Publisher
1	Stuart J. Russell andPeter Norvig	Artificial IntelligenceA Modern Approach	Prentice Hall, Third edition,2010 1.1,1.2,1.3,3.1,3.2,3.3,3.4,3.5,3.6,8.1,8.2,8.3, 8.4,9.1,9.2,9.3,9.4,9.5, 10.1,10.2,10.3,10.4,10.5,12.1,12.2, 12.3,12.4,18.1,18.2,18.3,18.4,18.5, 18.6,21.1, 21.2, 21.3, 21.4, 21.5, 21.6
2	Tom.M. Mitchell	Machine Learning	TMH(2013)4.2,4.3,4.4,4.5,4.6,4.8.3 ,4.8.4,8.1,8.2,8.3,8.4,8.5

Reference Text Books

	Author	Title	Publisher
1	Winston. P.H	Artificial Intelligence	Addison Wesley (1993)
2	Peter Flach	Machine Learning The Art and Science ofAlgorithms that Make Sense of Data	Cambridge University Press
3	Elaine Rich& Kevin Knight	Artificial Intelligence	TMH (1991)

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	CLOUD COMPUTING		
Course Code	21MCS404	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:2021-22	Year of Offering:2021-22	Year of Revision:2021-22	Percentage of Revision: 0%

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 Index 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 Open stack 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 Inadequate 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 CloudApplications 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 CloudComputing 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

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

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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-columnCash 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 – 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
5. Collection of proforma of bills and promissory notes
6.   Examinations (Scheduled and surprise test)

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TITE 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 ofOrganization.	15

Text book:

Business Organization and management – R.K.Sharma, Monika Aggarwal,RahulSharma.

Reference Books:

1. Business Organization - C.D.Balaji and G. Prasad, Margham Publications,Chennai.

2. Business Organization -R.K.Sharma and Shashi K Gupta, KalyaniPublications.

3. Business Organization & Management: Sharma Shashi K. Gupta, Kalyani Publishers.

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

Co-curricular activities

♦ Seminar on overview of business environment

♦ Debate on micro v/s macro dimensions of businessenvironment

♦ Seminar on Monetary policies ofRBI

♦ Debate on social, political and legalenvironment

♦ Group Discussions on Global environment and its impact onbusiness

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TITLE OF THE PAPER: ENTREPRENEURSHIPDEVELOPMENT

Commerce	COMT14S	*2021-2022*	*I.B.com(comp)*

Semester –I
.

Syllabus

Unit-I:Entrepreneurship:Entrepreneur characteristics Classification of Entrepreneurships Role of Entrepreneurship in economic development–Start-ups.

Unit-II:Idea Generation and Project Formulation: Sources of New Ideas in Entrepreneurships –Techniques for generating ideas - Preparation of Project Report –Content; Guidelines for Report preparation Project Appraisal techniques Economic Analysis; Financial Analysis; Market Analysis.

Unit III: Institutions Supporting and Taxation Benefits: Central level Institutions:NABARD;SIDBI,NSIC–statelevelInstitutions–DICs-SFC-SSIDC-Government Policy for SSIs-tax Incentives and Concessions–Non-tax Concessions Rehabilitation andInvestment Allowances.

ReferenceBooks:

1. AryaKumar,Entrepreneurship,Pearson,Delhi,2012.
2. PoornimaM.CH.,EntrepreneurshipDevelopment–SmallBusinessEnterprises,Pearson,Delhi,2009
3. MichaelH.Morris,ET.al.,EntrepreneurshipandInnovation,CengageLearning,NewDelhi,2011
4. KanishkaBedi,ManagementandEntrepreneurship,OxfordUniversityPress,Delhi,2009
5. AnilKumar,S.,ET.al.,EntrepreneurshipDevelopment,NewAgeInternationalPublishers,NewDelhi,2011
6. Khanka,SS,EntrepreneurshipDevelopment,S.Chand,NewDelhi.
7. PeterF.Drucker,InnovationandEntrepreneurship.

Commerce	SKILL DEVELOPMENTCOURSES COB-301G/C	*2021-2022*	*II.B.Com(gen/comp)*

TITLE OF THE PAPER: ONLINE BUSINESS
 Semester –I

Unit-I:
Introduction to Online-business-Definition-Characteristics-Advantages of Online Business-Challenges- Differences between off-line business, e-commerceandOnline Business.

Unit-II:
Online-business Strategies-Strategic Planning Process- Procurement – Logistics & Supply Chain Management-Customer Relationship management.

Unit-III:
Designing Online Business Website – Policies - Security & Legal Issues -OnlineAdvertisements-Payment Gateways-Case Study

Co-curricularActivitiesSuggested:(4hrs)
1. Assignments,Groupdiscussion,Quizetc.
2. Shortpracticaltrainingincomputerlab
3. Identifyingonlinebusinessfirmsthroughinternet
4. InvitedLecturesbye-commerceoperators
5. WorkingwithGoogleandHTMLadvertisements.
6. Visittoalocalonlinebusinessfirm.

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Commerce	CAA-302G/C	2021-2022	II.B.Com(gen/comp)

SEMESTER–III   *SYLLABUS*

Advanced Accounting

Unit-I:AccountingforNonProfitOrganisations:NonProfitEntities-Meaning-FeaturesofNon-ProfitEntities–ProvisionsasperSec8-AccountingProcess-Preparation of Accounting Records-Receipts and Payments Account- Income and Expenditure Account - Preparation of BalanceSheet (including problems)

Unit-II:SingleEntrySystem: Features – Differences between Single Entry and Double Entry – Disadvantages of Single Entry- Ascertainment of Profit and Preparation of Statement of Affairs(including Problems).

Unit-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 (includingProblems)

Unit-IV: Partnership Accounts-I: Meaning – Partnership Deed - Fixed and Fluctuating Capitals –Accounting Treatment of Goodwill –Admission and Retirement of a Partner (including problems)

Unit-V:PartnershipAccounts-II: DissolutionofaPartnershipFirm–Application of Garner v/s Murray Rule in India – Insolvency of one or morePartners (includingproblems).

ReferenceBooks:
1. CorporateAccounting –Haneef&Mukherji,
2. CorporateAccounting –RLGupta&Radhaswami
3. CorporateAccounting–P.C.Tulsian

Commerce	CBS-303G/C	2021-2022	II.B.Com(gen/comp)

SEMESTER–III   *SYLLABUS*

Business Statistics

Unit1IntroductiontoStatistics:
Definition, Importance and limitation of statistics, Collection of data, Schedule and questionnaire, Frequency distribution, Tabulation

Unit2:Measures of Central Tendency:
Characteristics of measures of central tendency, Types of Averages, Arithmetic Mean, Geometric Mean, Harmonic Mean, Median, Mode

Unit3:Measures of dispersion and Skewness:
Properties of dispersion, Range, Quartile Deviation, Meandeviation, Standarddeviation, Coefficient of Variation, Skewness Definition, KarlPearson's and Bowley's Measures of skewness

Unit4:Measuresof 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

Unit5:Analysisof TimeSeries&IndexNumbers
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

SuggestedReadings:

1. BusinessStatisticsReddy,C.RDeepPublications.
2. Statistics-ProblemsandSolutionsKapoorV.K.

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Commerce	CM304G	2021-2022	II.B.Com(gen)

SEMESTER–III

Marketing

SYLLABUS

Unit-I: Introduction: Concepts of Marketing: Need, Wants and Demand - Marketing Concepts – Marketing Mix - 4 P's of Marketing – MarketingEnvironment.

Unit-II: Consumer Behaviour and Market Segmentation: Buying DecisionProcess – Stages – Buying Behaviour – Market Segmentation –Bases ofSegmentation-Selecting Segments–AdvantagesofSegmentation

Unit-III: Product Management: Product Classification – Levels of Product - Product Life Cycle - New Products, Product Mix and Product Line Decisions - Design,Branding,Packagingand Labelling.

Unit-IV:PricingDecision: Factors Influencing Price–Determination of Price -Pricing Strategies: Skimming and Penetration Pricing.

Unit-V: Promotion and Distribution: Promotion Mix - Advertising – Sales promotion - Publicity – Public Relations - Personal Selling and Direct Marketing -Distribution Channels–Online Marketing

References:
1. PhilipKotler,MarketingManagement,PrenticeHallofIndia.
2. Philip Kotler & Gary Armstrong, Principles of Marketing, Pearson PrenticeHall
3. Stanton J. William & Charles Futrel, Fundamentals of Marketing, McGrawHillCompany

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Commerce	*CBL-501(U)*	*2021-2022*	*IIIB.Com(gen/comp)*

SEMESTER–V

SYLLABUS

Business Leadership

Unit-I: Introductory: Leadership - Traits, Skills and Styles- Leadership Development –Qualities of a GoodLeader.

Unit-II: Decision-Making and Leadership: Leadership for Sustainability - Power, Influence, Impact - Leadership Practices - Organizations and Groups: Organizational Culture and Leadership-Leadership in Business Organizations

Unit-III: Special Topics: Profiles of a few Inspirational Leaders in Business – Jemshedji Tata - Aditya Birla - Swaraj Paul - L N Mittal - N R NarayanaMurthy-AzimPremji,etc.

References:
1. Northouse,PeterG., Leadership:TheoryandPractice,SagePublications.
2. Daloz Parks, S., Leadership can be taught: A Bold Approach for a Complex World,Boston:HarvardBusiness School Press.
3. DruckerFoundation(Ed.), LeadingBeyondtheWalls,SanFrancisco:JosseyBass.
4. Al Gini and Ronald M. Green, Virtues of Outstanding Leaders: Leadership andCharacter,John Wiley& SonsInc.
5. S Balasubramanian, The Art of Business Leadership – Indian Experiences,SagePublications.

Commerce	CCOA-502G/CC	2021-2022	IIIB.Com(gen/comp)

SEMESTER–V

SYLLABUS

CostAccounting

UnitI:Introduction:Distinguish between Financial Accounting, Cost Accounting and management accounting - Cost Concepts and Classification – Cost Centre and Cost Unit –Preparation of Cost Sheet.

Unit-II: Elements of Cost: Materials: Material control – Selective control, ABC technique –Methods of pricing issues– FIFO,LIFO, Weighted average,Base stock methods, choice of method(includingproblems).

Unit-III: Labour and Overheads: Labour: Control of labour costs – time keeping and timebooking – Idle time –Methods of remuneration – labour incentives schemes - Overheads:Allocationand apportionment ofoverheads– Machine hourrate.

Unit-IV: Methods of Costing: Job costing – Processcosting - treatment of normal andabnormal process losses – preparation of process cost accounts – treatment of waste andscrap, joint products and byproducts (includingproblems).

Unit -V: Costing Techniques: Marginal Costing – Standard costing – Variance Analysis(includingproblems).

References:
1. S.P.JainandK.L.Narang–AdvancedCostAccounting, KalyaniPublishers, Ludhiana.
2. M.N.Aurora– AtestbookofCostAccounting,VikasPublishingHousePvt.Ltd.
3. S.P. Iyengar– CostAccounting,SultanChand&Sons.
4. Nigam &Sharma–CostAccountingPrinciplesandApplications,S.Chand&Sons.

Commerce	CTAX-503CC	2021-2022	III.B.Com(comp)

SEMESTER–V   **TAXATION**

SYLLABUS

Unit-I: Introduction: Objectives - Principles of Taxation - Brief History - Basic Concepts; Capital and Revenue; Basis of Charge - Exempted Incomes - Residential Status – Incidence ofTaxation.

Unit-II: Direct and Indirect Taxes – Service Tax – VAT – Central Sales Tax – Latest Developments.

Unit-III: Computation of income under different heads: Income from Salary; Income from House Property; Deductions u/s 80C to 80U - Income from Capital Gains; Income from Other Sources (simpleproblems).

Unit-IV: Taxation System in India: Objectives; Tax Holiday; Modes of Tax Recovery(Section190 and 202); Payments and Refunds; Filingof Returns.

Unit-V: Tax Planning: Tax Avoidance and Tax Evasion; Penalties and Prosecutions; IncomeTaxAuthorities.

References:
1. VinodK.SinghaniaDirectTaxes- LawandPractice,TaxmanPublication.
2. B.B.Lal:DirectTaxes,KonarkPublisher(P)Ltd.
3. BhagwatiPrasad:DirectTaxes – LawandPractice,WishwaPrakashan.
4. Dr.MehrotraandGoyal:DirectTaxes– Law andPractice,SahityaBhavanPublication.

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Commerce	CGST-503G/C	2021-2022	III.B.Com(gen)

GOODS & SERVICE TAX FUNDAMENTALS

SEMESTER–V

SYLLABUS

Unit I: Introduction: Overview of GST - Concepts – Limitations of VAT – Need forTax Reforms - Justification for introduction of GST - Shortcomings and advantages atthe Central Level and State Level on introduction of GST- Process of Introduction of GST-Constitutional Amendments.

Unit II: GST: Principles – Models of GST: Austrlian, Candian, Kelkar-Shah –BagchiPoddar -Comprehensive structure of GST model in India: Single, Dual GST–Transactionscovered under GST.

Unit-III:Taxes and Duties: Subsumed under GST - Taxes and Duties outside thepurview of GST: Tax on items containing Alcohol – Tax on Petroleum products - TaxonTobacco products-Taxation ofServices

Unit-IV: Inter-State Goods and Services Tax: Major advantages of IGST Model –Interstate Goods and Service Tax: Transactions within a State under GST – InterstateTransactionsunder GST-Illustrations.

Unit-V: Time of Supply of Goods & Services: Value of Supply - Input Tax Credit –Distribution of Credit -Matching of Input Tax Credit - Availability of credit in specialcircumstances-Crossutilizationof ITCbetweentheCentralGSTandthe StateGST.

References:
1. GoodsandServicesTaxinIndia–Notificationsondifferentdates.
2. GSTBill2012.
3. Background Material on Model GST Law, Sahitya Bhawan Publications, HospitalRoad,Agra-282 003.
4. The Central Goods and Services Tax Act, 2017, NO. 12 OF 2017 Published byAuthority,MinistryofLawand Justice, NewDelhi, the12thApril,2017

Commerce	*CCG-504G/CC*	*2021-2022*	*III.B.Com(gen/comp)*

SEMESTERV

SYLLABUS

Commercial Geography

Unit –I: The Earth: Internal structure of the Earth – Latitude – Longitude – Realms of theEarth –Evolution of the Earth – Environmental pollution - Global Warming - Measures to be taken to protect the Earth.

Unit -II: India – Agriculture: Land Use - Soils - Major crops – Food and Non-food Crops –Importance of Agriculture–Problemsin Agriculture–Agriculture Development.

Unit -III: India – Forestry: Forests – Status of Forests in Andhra Pradesh – Forest(Conservation)Act, 1980 – Compensatory Afforestation Fund (CAF) Bill, 2015 – Forest Rights Act, 2006 and its Relevance–Need for protection of Forestry.

Unit -IV: India – Minerals and Mining: Minerals – Renewable and non Renewable – Use ofMinerals – Mines – Coal, Barites, etc. – Singareni Coal mines and Mangampeta Barites –DistrictwiseProfile.

Unit-V: India – Water Resources – Rivers: Water resources - Rationality and equitable use ofwater – Protection measures - Rivers - Perennial and peninsular Rivers - Interlinking ofRivers-ExperienceofIndia and AndhraPradesh.

References:
1. Shabiar Ahmad; Quazi ,Natural Resource Consumption and Environment Management,APHPublishingCorporation.
2. Tarachand,Economic andCommercialGeographyofIndia,VikasPublishingHouse.
3. Dr.S.Sankaran,CommercialGeography,MargamPublications,Chennai.
4. C.B.Memoria,CommercialGeography, LalAgarwal &Co.

Commerce	*CCB505CEG/C*	*2021-2022*	*III.B.Com(gen)*

SEMESTER V

SYLLABUS

CentralBanking

Unit-I: Introduction: Evolution and Functions of Central Bank - Development of Central Banks in Developed and Developing countries-Trends in Central Bank Functions.

Unit-II: Central banking in India: Reserve Bank of India - Constitution and Governance, Recent Developments, RBI Act.-Interface between RBI and Banks.

Unit-III: Monetary and Credit Policies: Monetary policy statements of RBI - CRR - SLR –Repo Rates –Reverse Repo Rates –Currency in circulation-Credit control measures.

Unit-IV: Inflation and price control by RBI: Intervention mechanisms - Exchange rate stability-Rupee value-Controlling measures.

Unit-V: Supervision and Regulation: Supervision of Banks - Basle Norms, Prudential Norms,Effectof liberalization and Globalization-Checking of money laundering and frauds.

References:
1. ReserveBankof IndiaPublication,FunctionsandWorkingoftheRBI.
2. VasantDesai,Central BankingandEconomicDevelopment,HimalayaPublishing.
3. S.Panandikar,Bankingin India, Orient Longman.
4. ReserveBankofIndia Publication,ReportonTrendsandProgressofBankingin India.
5. AnnualReportsofReserveBankofIndia.
6. RitaSwami, IndianBankingSystem,InternationalPublishingHousePt.Ltd.

Commerce	CRC-506 CEG/C	2021-2022	III.B.Com(gen)

SEMESTER–V

SYLLABUS

Rural andFarm Credit

Unit-I: Rural Credit: Objectives and Significance of Rural credit - Classification of ruralcredit -General CreditCard (GCC)– FinancialInclusion-RupayCard.

Unit-II: Rural Credit Agencies: Institutional and Non-institutional Agencies for financingagriculture and Rural development - Self-Help Groups (SHG) - Financing for RuralIndustries.

Unit-III: Farm Credit: Scope - Importance of farm credit - Principles of Farm Credit -Types-CostofCredit--problemsand remedialmeasures-KisanCredit Card(KCC) Scheme.

Unit-IV: Sources of Farm Credit: Cooperative Credit: PACS - APCOB - NABARDSLBC-Lead Bank Scheme - Role of Commercial and Regional Rural Banks - Problems of recovery and over dues.

Unit-V: Farm Credit Analysis: Eligibility Conditions - Analysis of 3 R's (Return, Repayment Capacity and Risk-bearing Capacity) - Analysis of 3 C's of Credit (Character, Capacity andCapital)-Crop index reflecting use and farm credit-Rural Credit SurveyReports..

References:
1. NationalBankofAgriculturalandRuralDevelopment(NABARD)Annualreport.
2. EconomicSurvey,GovernmentofIndia.
3. RuralDevelopment,Sundaram I.S.,HimalayaPublishingHouse,Mumbai.
4. RuralCreditin India,C.S.Rayudu,MittalPublications.
5. Farm Credit and Co-operatives in India, Tiruloati V., Naidu. V T Naidu, Vora & Co. Pub.Ltd.

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Department of Commerce

Minutes of the meeting of Board of Studies

31-3-2022

TITLE OF THE PAPER: Financial Accounting
  Semester: I
                    Syllabus

Course Details

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 – Pragthiprakesh 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
5. Collection of proforma of bills and promissory notes
6. Examinations (Scheduled and surprise test)

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TITLE OF THE PAPER: BUSINESS ECONOMICS

Semester: II

Syllabus

Unit	Learning Units	Lecture Hours
I	**INTRODUCTION :** Meaning and Definition of EconomicsWealthDefinitionWelfare Definition Scarcity DefinitionMeaning and Definition of Business Economics Nature and Scope of Business EconomicsMicro Economics and Macro Economics	15
II	**DEMAND AND SUPPLY ANALYSIS :**Meaning and Definition of demand Determinants of Demand – Demand FunctionLaw of Demand – Demand curve – exceptionsElasticity of DemandTypes of Price Elasticity of Demand Methods to measure Price Elasticity of DemandLawof Supply-Exceptions to the Law	15
III	**PRODUCTION, COST AND REVENUE ANALYSIS :**Production Analysis – Production Function –MeaningThe law of variable proportionsThe law of Returns to Scale **Cost Analysis:** Short Run Cost Curves Relationship between AC & MC Curves**RevenueAnalysis:**Revenue Concepts & Revenue curvesMeaning of Breakeven point & Breakeven chart	15
IV	**MARKET STRUCTURES:**Classification of marketsFeatures of Perfect competition Price determination under perfect competition Features of Monopoly marketFeatures of monopolistic competition marketFeatures of Oligopoly marketKinky 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, RPCINational 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 CyclesControlling Measures of Trade Cycles	15

Text Books :
Business Economics – A.V. Ranganadhachary – Kalyani Publishers
Business Economics – Telugu Academy

Reference Books:
H.L. AHUJA – Business Economics – S.Chand& Company Publishers
P.N. CHOPRA – Business Economics – Kalyani Publishers
D.M. MITHANI-Fundamentals of Business Economics-Himalaya Publishers
DEEPASHREE – General Economics – Tata Mc. GrawHills

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TITLE OF THE PAPER: Banking Theory &Practice
Semester: II

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction:** Meaning & Definition of Bank – Functions of Commercial Banks – Credit Creation with Examples - Kinds of Banks – Central Banking Vs. Commercial Banking.	15
II	**Banking Systems:** Unit Banking, Branch Banking, Investment Banking - Innovations in Banking – E banking -Online and Offshore Banking, Internet Banking - Anywhere Banking - ATMs – RTGS-NEFT – Mobile Banking	15
III	**Types of Banks:** Indigenous Banking - Cooperative Banks, Regional Rural Banks, SIDBI, NABARD - EXIM bank	15
IV	**Banker and Customer:** Meaning and Definition of Banker and Customer – Types of Customers – General Relationship and Special Relationship between Banker and Customer - KYC Norms.	15
V	**Collecting Banker and Paying Banker:** Concepts - Duties & Responsibilities of Collecting Banker – Holder for Value – Holder in Due Course – Statutory Protection to Collecting Banker - Responsibilities of Paying Banker -Payment gateways.	15

Text Book:
Banking theory law and practice - Himalaya publishing House

Reference books:
1.Banking theory and practice - Himalaya publishing house
2.Banking - New age international publishers
3.Banking theory and practice- kalyani publishers

Curricular and co- curricular activities:
1.Debate
2.Student seminars
3.Quiz programs
4.Visit to bank premises
5.Know about KYC norms

TITLE OF THE PAPER: ADVERTISING
Semester: II

Commerce	**CAD201G/C**	*2021-2022*	*I.B.Com(Gen,comp&e-com)*

Skill Development Course

Total30hrs(2hrs/wk)credits02   **Maximum50Marks**

UNIT I: Introduction of advertising
concepts- functions - Types of advertising – Creative advertising 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 Statutory Bodies 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 –Reachingtargetgroups-Localadvertising–Feedbackonimpactofadvertisement –Business promotion.

1. Collection and segmentation of advertisements

2. Invited Lectures/skills training on local advertising basics and skills

3. Visit to local advertising agency

4. Model creation of advertisement sin compliance with legal rules

5. Assignments, Group discussion ,Quiz etc

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 - 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 &RadhaSwami,Sultan Chand & sons
Co-Curricular Activities:

☐ Assignments

☐ Problem Solving Exercises

☐ Collect and fill the share application form of a limited Company

☐ Collect Prospectus of a company and identify its salient features

☐ Collect annual report of a Company and List out its assets and Liabilities.

☐ Collect the annual reports of company and calculate the value of goodwill under

different methods

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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 Wages- Incentive Schemes -Time Rate Method, Piece Rate Method, Halsey, Rowan Methods and Taylor Methods only(including problems)	15
III	**Job Costing and Batch Costing**: Definition and Features of Job Costing – Economic Batch Quantity (EBQ) – Preparation of Job Cost Sheet – Problems on Job Cost Sheet and Batch Costing(including problems)	15
IV	**Financial Statement Analysis and Interpretation**: Financial Statements - Features, Limitations. Need, Meaning, Objectives, and Process of Financial Statement Analysis- Comparative Analysis – Common Size Analysis and Trend Analysis (including problems)	15
V	**Marginal Costing**: Meaning and Features of Marginal Costing – Contribution –Profit Volume Ratio- Break Even Point – Margin of Safety – Estimation of Profit and Estimation of Sales(including 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.

4. Nigam & Sharma – Cost Accounting Principles and Applications, S.Chand& Sons.

5. S.N. Maheswari– Principles of Management Accounting, Sultan Chand & Sons.

TITLE OF THE PAPER: Income Tax
Semester: IV

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction**: Income Tax Act-1961 - Basic Concepts: Income, Person, Assesses - Assessment Year, Previous Year, Rates of Tax, Agricultural Income,ResidentialStatusof Individual -Incidence of Tax – IncomesExempt 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 Capital Asset – 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, SahityaBhavan

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TITLE OF THE PAPER::Business Laws
Semester: IV

Syllabus

Unit	Learning Units	Lecture Hours
I	**Contract**: Meaning and Definition of Contract - Essential Elements of Valid Contract - Valid, Void and Voidable Contracts - Indian Contract Act, 1872	**15**
II	**Offer, Acceptance and Consideration**: Definition of Valid Offer, Acceptance and Consideration - 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 Unpaid Vendor- Definition of Consumer - Person - Goods - Service - Consumer Dispute - Consumer Protection Councils - Consumer Dispute Redressed Mechanism	**15**
V	**Cyber Law**: Overview and Need for Cyber Law - Contract Procedures - Digital Signature – Safety Mechanisms	**15**

References:

1. J. Jaysankar, Business Laws, MarghamPublication.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. PillaiBhagavathi, 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 andReappointment – 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.

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TITLE OF THE PAPER: Goods and Service Taxes
Semester: IV

Syllabus

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 KelkarSha 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: Event management
Semester: VI

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**Event Concept:** Corporate Events and Customer's needs - Types of Events - Corporate hospitality – Exhibitions – Trade Fairs – Conferences –Business and Government Meets - Corporate event packages - Menu Selection - Customization.	10
II	**. Outdoor Events:** Logistics, Types of Outdoor events, Risk management - Health and safety, Marketing and sponsorship, HR Management, Programming and Entertainment.	10
III	**Celebrity Events:** Launches, Fashion shows, National festivals and high-profile charity events - Liaison with agents, Contract Negotiations, Client briefings, Celebrity wish lists and expectations - Liaisoning with Govt. Departments.	10

References:
1. Event Management: A Blooming Industry and an Eventful Career by Devesh Kishore, Ganga Sagar Singh - Har-and Publications Pvt. Ltd.
2. Event Management by Swarup K. Goyal - Adhyayan Publisher.
3. Event Management & Public Relations by Savita Mohan - Enkay Publishing House
4. Event Entertainment and Production - Mark Sonder, CSEP, Wiley & Sons, Inc.
5. Special Event Production - Doug Matthews. 6. Fenich, G. Meetings, Expositions, Events, and Conventions: An introduction to the industry. New Jersey: Pearson Prentice Hall.

TITLE OF THE PAPER: Marketing
Semester: VI

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introduction:** Concepts of Marketing: Product Concept – Selling Concept - Societal Marketing Concept – Marketing Mix - 4 P's of Marketing – Marketing Environment.	15
II	**Consumer Markets and Buyer Behavior**: Buying Decision Process – Stages – Buying Behavior – Market Segmentation – Selecting Segments – Advantages of Segmentation.	15
III	**Product Management:** Product Life Cycle - New products, Product mix and Product line decisions - Design, Branding, Packaging and Labeling.	15
IV	**Pricing Decision:** Factors influencing price determination, Pricing strategies: Skimming and Penetration pricing.	15
V	**Promotion and Distribution:** Promotion Mix - Advertising - Publicity – Public relations - Personal selling and Direct marketing - Distribution Channels – Online marketing- Global marketing.	15

References:
1. Philip Kotler, Marketing Management, Prentice Hall of India.
2. Philip Kotler& Gary Armstrong, Principles of Marketing, Pearson Prentice Hall
3. Stanton J. William & Charles Futrel, Fundamentals of Marketing, McGraw Hill Company
4. V.S. Ramaswamy S. NamaKumari, Marketing Management – Planning, McMillan

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TITLE OF THE PAPER: Auditing
 Semester: VI
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 Program - 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

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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

TITLE OF THE PAPER: Management Accounting
Semester: VI

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**Management Accounting:** Interface with Financial Accounting and Cost Accounting - Financial Statement analysis and interpretation: Comparative analysis – Common size analysis and trend analysis (including problems).	15
II	**Ratio Analysis:** Classification, Importance and limitations - Analysis and interpretation of Accounting ratios - Liquidity, profitability, activity and solvency ratios (including problems).	15
III	**Fund Flow Statement:** Concept of fund: Preparation of funds flow statement. Uses and limitations of funds flow analysis (including problems).	15
IV	**Cash Flow Statement:** Concept of cash flow – Preparation of cash flow statement – Uses and limitations of cash flow analysis (including problems).	15
V	**Break-Even Analysis and Decision Making:** Calculation of Break-even point - Uses and limitations - Margin of safety – Make/Buy Decision - Lease/own Decision (including Problems).	15

References:
1. S.N. Maheswari, A Textbook of Accounting for Management, S. Chand Publishing, New Delhi.
2. I.M Pandey, "Management Accounting", Vikas Publishing House, New Delhi,
3. Shashi K. Gupta & R.K. Sharma, "Management Accounting: Principles and Practice", KalyaniPublishers, Ludhiana.
4. JawaharLal, Accounting for Management, Himalaya Publishing House, New Delhi.
5. Charles T. Horngren, et.al, "Introduction to Management Accounting" Person EducationIndia, New Delhi, 2002.

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TITLE OF THE PAPER: Financial Services
Semester: VI

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**Financial Services:** Role of Financial Services - Banking and Non Banking Companies – Activities of Non Banking Finance Companies- Fund Based Activities - Fee Based Activities .	15
II	**Merchant Banking Services:** Scope and importance of merchant banking services -Venture Capital - Securitization –Demat services - Commercial Papers – Treasury bills	15
III	**Leasing and Hire-Purchase:** Types of Lease, Documentation and Legal aspects –Fixation of Rentals and Evaluation - Hire Purchasing- Securitization of debts - House Finance.	15
IV	**Credit Rating:** Purpose – Types – Credit Rating Symbols – Agencies: CRISIL and CARE – Equity Assessment vs. Grading – Mutual funds.	15
V	**Unit-V: Other Financial Services:** Factoring and Forfeiting - Procedural and financial aspects – Installment System - Credit Cards - Central Depository Systems: NSDL, CSDL.	15

References:
1. B. Santhanam, Financial Services, Margham Publication, Chennai.
2.M.Y. Khan, Financial Services, Tata McGraw – Hill, New Delhi.
3. Machendra Raja, Financial Services, S.Chand Publishers, New Delhi.
4. V. A. Avdhani, Marketing of Financial Services.
5. Machiraji, "Indian Financial System", Vikas Publishers.
6. SandeepGoel, Financial Services, PHI Learning.
7. L.M. Bhole, Financial Institutions and Markets, Tata McGraw Hill.

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TITLE OF THE PAPER: MARKETING OF FINANCIAL SERVICES
 Semester: VI

SYLLABUS

Unit	Learning Units	Lecture Hours
I	**Difference between Goods and Services:** Managing Service Counters – Integrated Service Management – Service Elements.	15
II	**Constructing Service Environment** Managing People for service Advantage – Service Quality and Productivity – Customer Loyalty.	15
III	**Pricing and Promotion Strategies:** Pricing strategies – Promotion strategies – B2B Marketing – Marketing Planning and Control for services.	15
IV	**Distributing Services:** Cost and Revenue Management – Approaches for providing services - Channels for Service provision – Designing and managing Service Processes.	15
V	**Retail Financial Services** Investment services – Insurance services - Credit Services - Institutional Financial Services - Marketing practices in select Financial Service Firms.	15

References:

1. Aradhani "Marketing of Financial Services" Himalaya Publications

 2. Sinha and Saho, Services Marketing, Himalaya Publishing House

 3. Reddy Appanaiah, Anil Kumar and Nirmala, Services Marketing, Himalaya Publishing.

 4. Shajahan, Services Marketing, Himalaya Publishing House.

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DEPARTMENT OF CMMERCE PG

HIGHLIGHTED SYLLABUS OF COMMERCE PG

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   🟩

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M.COM   SEMESTER – I
SYLLABUS
CO101: MANAGEMENT THEORY AND PRACTICE

Unit–I: **Introduction: Management, Concept, Significance, Levels, Skills**, Functions and Principles - Management as an Art, Science and Profession – **Social responsibilities of business**.

Unit–II: Planning: Nature, Purpose, Process of Planning, Types of Plans – Premising & Forecasting, Decision Making: Concept, Process, Management By Objectives: Concepts, Process. Advantages and Limitations.

Unit–III: **Organizing: Process - Formal and Informal Organizations -Depart mentation: Methods of departmentation**, Span of Control; V.A. Graicuna's Theory - Factors Determining Span of Control - Delegation: Concept, Process, Advantages and Principles of Effective Delegation; Decentralization: Factors, Advantages and Disadvantages. Line and Staff: Concept- Reasons for Conflicts between Line and Staff and Measures to Overcome; Committees, Types of Committees.

Unit–IV: **Staffing: Nature and Importance of Staffing, Elements of Staffing**. **Directing:** Meaning, Assumptions of Human Behavior by Douglas McGregor, Edgar Shien and Elton Mayo.

Unit–V: **Motivation: Significance, Process**-Theories of Maslow, Herzberg, Porter and Lawler; Leadership: Trait Approach, Leadership Styles, Managerial Grid; Likert's Four Systems of Leadership- **Communication: Importance, Process, Barriers, Measures to overcome Barriers of an Effective Communication.Controlling:** Basis - Control Process, Requirements of adequate Control - Techniques of control, PERT and CPM

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M.COM   SEMESTER – I
SYLLABUS

CO102: BUSINESS ECONOMICS

Unit-I: <mark>**Introduction – Definition, Nature and Scope of Managerial Economics**</mark>; Economic Goals of a Business Firm: Profit Maximization Vs Wealth Maximization, Sales Revenue Maximization.

Unit-II: <mark>**Consumer Equilibrium under Cardinal and Ordinal Utility - Demand Analysis**</mark> – Law of Demand – Demand Function and determinants of Market Demand – Concept of Price, Cross, Income and Promotional Elasticity; their measurement and relevance in Managerial Decision – Making Methods of Demand Forecasting.

Unit-III: <mark>**Firm's Equilibrium – Iso-quant and Iso-cost analysis; Least – Cost Combination of inputs**</mark> **–** The law of Diminishing Marginal Returns in Production – Production Function – Total Product, Marginal and Average Product Curves, their inter – relationships – Cobb – Douglas Production Function and its relevance - Scale and proportion, Cost Functions – Derivation of total, marginal and average cost functions – Long run cost curves

Unit-IV: <mark>**Market Structures and their characteristics**</mark> – Pricing and output Decisions of firm under different Market structures – Perfect Competition, Pure Monopoly, Oligopoly, Monopolistic / Imperfect Competition under short and long runs. Discriminative Monopoly Regulation of Monopoly through Prices and Taxes.

Unit-V: <mark>**Pricing Practices of Firms – Objectives of Pricing Policy**</mark> – Approaches to Pricing New Products; Skimming Price, Penetration Pricing, Costs Plus Pricing, Managerial Cost Pricing, Psychological Pricing, Odd Number Pricing, Regulated Pricing, Predatory Pricing

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M.COM   SEMESTER – I
SYLLABUS

CO103: BUSINESS ENVIRONMENT

Unit-I: **Business Environment**: Components and Significance - Nature of Business Environment - Techniques of Environmental Scanning and Monitoring **– Economic Scope – Cultural, Political, Technological and External Factors Influencing Business Environment – Challenges- Economic systems.**

Unit-II: **Economic Environment of Business**: Significance for Business – Economic Planning – Objectives and Achievements; Government policies – Industrial policy of 1991; Fiscal policy; **Economic Reforms and LPG**

Unit-III: **Political and Legal Environment of Business**: Political Institutions – Legislature, Executive and Judiciary – Changing Dimensions of Legal Environment in India; **Patents Act-1970, SICA-1985, SEZ Act-2005.**

Unit-IV: **Cultural and Technological Environment**: **Elements of Socio – Cultural Environment; Impact on Business – Social Audit** - Technological Environment in India; Technology Transfer – Technology Policy.

Unit -V: International and Recent Issues in Environment: Multinational Corporations; Foreign Collaborations and Indian Business; International Economic Institutions: **WTO, World Bank, IMF and their importance to India;** Foreign Trade Policies.

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M.COM   SEMESTER – I
SYLLABUS

CO104: ENTREPRENEURSHIP DEVELOPMENT

UNIT-I:

Entrepreneur: Evolution, Characteristics, Types, Functions of Entrepreneur - Factors influencing entrepreneurship - Barriers to entrepreneurship -   Growth of Entrepreneurship in India -Women entrepreneurship in India - Role of Entrepreneurship in Economic Development

UNIT-II:

Idea Generation and Opportunity Assessment: Importance of Ideas in Entrepreneurship - Sources of New Ideas – Techniques for generating ideas- Steps in assessing business potential of an idea- Opportunity Recognition- sources and process- Steps in tapping opportunity.

UNIT-III:

Financing Of Enterprises: Need for Financial Planning- Sources of finance, Capital Structure, Term-loan, - Sources of Short-Term Finance, Venture capital, Export Finance,- Institutional Finance To Entrepreneurs, - Preparation of Business Plans**.**

UNIT-IV:

 Institution support in small business enterprises: Introduction **–** central level institutions-KVIC;SIDO;NSIC ltd; National Productivity Council (NPC); EDII – State level institutions –DIC-SFC-SSIDC-Industry Associations- CII;FICCI;ASSOCHAM**.**

UNIT-V:

Government Policy and Taxation Benefits : Government Policy for SSIs- Need for tax benefits-Tax Holiday; Rehabilitation allowance ; Investment allowance ; Tax concessions for SSIs in rural and Rural and backward areas**.**

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M.COM   SEMESTER – I
SYLLABUS

CO105:INFORMATION TECHNOLOGY FOR BUSINESS

Unit-I: Information Technology (IT) in Business Environment: Business in the Information Age - Pressures and Responses, Why do we need to know about Information Technology, What is an Information System, Capabilities of Information Systems - Basic concepts of Information Systems, organizations - Structures and IT support - IT support at different organizational levels, Managing IT in organizations

Unit-II: IT Infrastructure: Computer Hardware - Input Technologies, Output Technologies - Computer Software - Types of software, general functions of Operating system, Types of application software - Managing organizational Data and Information - Basics of Data arrangement and Access, Traditional file Environment. Databases: Modern Approach, Database Management Systems - Logical Data Models, Data Warehouse. Telecommunications systems and Networks - Network communications software, Internet: Services provided by Internet, World Wide Web, Intranets and Extranets.

Unit-III: Information Systems to Support Business Functions: Transaction Processing Systems, Accounting and Finance Systems, Production Management Systems, Human Resources Management Systems, Integrated Information Systems and Enterprise Resource Planning, Inter-organizational/Global Information Systems. Electronic Commerce - Types, Benefits of E- Commerce, Infrastructure and E-commerce support, Legal and ethical issues in E-commerce. Computer-based Supply chain management and IS Integration: IT supply chain support and systems Integration: Enterprise Resource Planning.

Unit-IV: Data, Knowledge and Decision Support: Decision making and Decision support systems, Enterprise Decision support, Knowledge Management and Organizational Knowledge bases. Intelligent systems in Business: Export systems, Intelligent Agents.

Unit-V: Strategic Advantage and Information Technology: Strategic Organizations in the Information Age, Business Process Re-engineering, Virtual corporations and Information Technology - Implementing IT: Ethics, Impacts and Society, Ethical Issues, Impact of IT on Organizations and Jobs, on Individuals at Work, Societal Impact and Internet Communities, Protecting Information Systems.

AG & SG Siddhartha Degree College of Arts & Science (Autonomous), Vuyyuru – 521 165.

(An autonomous college in the jurisdiction of Krishna University, Machilipatnam)

M.COM   SEMESTER – I
SYLLABUS

CO106: QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

UNIT-I: **Matrices, Differentiation, Permutations and combinations**: **Matrices –Basic concepts** ,Solving system of equations with Cramer's rule and Inverse method - Differentiation and integration of simple functions and their applications- Permutations and Combinations.

UNIT-II: **Correlation and Regression: Correlation**: **Types of Correlation** - Simple and Rank Correlation coefficient in the case of two variables- **Regression**: **Meaning and importance of Regression Analysis**. Estimation of Lines of Regression in the case of two variables.

UNIT-III: **Probability: Concept of Probability: Definitions of Probability**, Addition Theorem of Probability, Conditional Probability and Multiplication theorems of Probability, Baye's Theorem of Probability and its **Applications**.

UNIT- IV: **Theoretical distributions:** Binomial Distribution, Poisson distribution and Normal distribution – their **Properties and Applications.**

UNIT-V: **Testing of Hypothesis: Concept of Testing of Hypothesis, Types of Errors, Standard deviations and Proportions**, Z- test for Means, T-test, F-test for two variances and Chi-Square test for goodness of fit and independent of Attributes and their Applications – Confidence intervals.

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(An Autonomous college under the jurisdiction of Krishna University)
Reaccredited at the level '**A**' by the NAAC

Business Laws

Unit –I
Companies Act 2013: Definition and Nature of Company - Incorporation of company – Prospectus - Shares and Debentures - Acceptance of Deposits - Appointment and Qualification of Directors - Meetings of Boards and its powers - Inspection and investigation - Compromises, arrangements and amalgamations - Prevention of oppression and Mismanagement - SEBI Act, 1992

Unit- II
Depositories Act, 1996 – Prevention of Money Laundering Act, 2002.

Unit- III
Consumer Protection Act, 1986 – Competition Act, 2002 – Environment Protection Act – Right to Information Act, 2005

Unit –IV
Foreign Exchange Management Act, 1999- Cyber laws-Information Technology Act, 2000.

Unit – V
Corporate Governance and Business Ethics – Ethical practices and guidelines: Internal to the Organization – Power and freedom: External to the organization.

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FINANCIAL MANAGEMENT

Unit–I: Introduction: Nature, Scope and Objectives of Financial Management: Finance Function–Profit Goal vs. Wealth Goal Maximization - Financial Manager in Modern business Organizations (Theory)

Unit–II: **Investment decision**: Capital Budgeting process –Methods of appraisal: Traditional Techniques and Discounted Cash Flow Methods – NPV vs. IRR - Capital rationing (Theory & problems)

Unit–III: Financing decisions: Concept of leverage – Types of Leverages –EBIT – EPS Analysis – Capital Structure – Theories of Capital Structure – Net Income approach – Net Operating income approach – Traditional view – MM Hypothesis Cost of Capital**:** Types of Cost of Capital - Weighted average Cost of capital. Capital Structure Determinants.(Theory & problems)

Unit–IV: **Dividend decisions**: Kinds of dividends, Dividend Policy types, Dividend Theories –Walter's Model – Gordon's Model – M-M Hypothesis (Theory & problems)

Unit–V: Working Capital Management: Meaning, Significance, Types of Working capital, Determinants of working capital, and Methods of Measuring working Capital Requirements - Operating cycle -Financing of Working Capital-Management of Cash, Receivables, and Inventory (Theory & problems)

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Reaccredited at the level '**A**' by the NAAC

HUMAN RESOURCE MANAGEMENT

Unit- I: Human Resource Management: Nature and significance, functions of HRM, Qualities and Role of HR Manager, HRM Model, HRM in a changing Environment.

Unit-II: Human Resource Planning: Objectives, process, factors affecting HR Planning, Requisites for successful HR Planning, Recruitment – Factors influencing, Sources of Recruitment – E- Recruitment-Selection Process – Placement, induction and Socialization – Promotion and Transfers

Unit-III: Employee Training: Significance – Identification of Training Needs – Employee Training Methods – Executive Development Methods – Evaluation of Training and Development Programs – Methods of Evaluation -Limitations to its effectiveness

Unit-IV: Performance Appraisal: Scope & Significance – Methods of Appraisal – Limitations of Appraisal - Career Planning and Development – Counseling- Mentoring-Coaching

Unit – V:Wage and Salary Administration: Wage Structure and Policy – Wage Differentials – Wage Payment Methods – Incentives – Fringe Benefits –Industrial Relations: Causes of Disputes and Settlement - Role of State in Industrial Relations - Collective Bargaining -Employee Participation in Management - Quality of Work Life.

AG&SG SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE VUYYURU
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Reaccredited at the level '**A**' by the NAAC

MARKETING MANAGEMENT

Unit-I: Marketing-Concepts-Approaches to the Study of Marketing – Functions of Marketing-Marketing Environment.

Unit-II: Consumer Behavior – Factors affecting Consumer Behavior- Market Segmentation –Market Targeting and Positioning – Marketing Information System and Marketing Research.

Unit-III: Marketing Mix: Product Planning – New Product Development – Product Life Cycle– Branding &Packaging – Product line- Product Mix Management- Product Vs Service.

Unit-IV: Pricing and Distribution: Pricing Objectives – Methods and Strategies ; Channels of distribution – Channel Selection and Management -Retail Management.

Unit-V: Promotion: Promotion Mix-Personal Selling-Advertising - Sales Promotion, Publicity and Public Relations – Direct Marketing; Promotional strategies- Web Marketing – Integrated Marketing Communications.

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(An Autonomous college under the jurisdiction of Krishna University)
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BUSINESS ANALYTICS AND RESEARCH METHODS

Unit –I : Introduction-Importance of Research, Types of research , Research Process-Problem Identification- Formulation-Classification, Concept and Construction of Hypothesis – Steps in Testing Hypothesis.

Unit-II: Research Design-Meaning, purpose and Principles – Types of Research Design – Exploratory-Descriptive- Experimental, Data Collection-Sources of Data-Methods of Data Collection-Questionnaire Design and Pre Testing of Questionnaire.

Unit-III: Sampling & Sampling Designs-Determination of Sample Size-Census Survey Vs Sample Survey –Advantages of Sampling-Sampling Methods-Probability Sampling-Non Probability Sampling.

Unit-IV: Data Tabulation-Analysis and Interpretation: Tabulation of data and general rules of tabulation Graphic and Diagrammatic Representation of Data-ANOVA-One way and Two way classification.

Unit-V: Research Report Writing and Presentation: Concept, Purpose, Guidelines for Research Report Writing –Steps in Report Writing-Layout of Report-Types of Research Reports-Presentation of Research Report.

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(An Autonomous college under the jurisdiction of Krishna University)
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E-COMMERCE

Unit-I : <mark>History of E-commerce and Indian Business Context</mark>: origin of E-commerce – Traditional vs. E-Commerce - Internet and World Wide Web- Business Models for e-Commerce-B2C, B2B, C2C & C2B, Merits and Limitations- Advantages and Disadvantages of E-commerce - Introduction to E-business -E-commerce vs E-business

Unit-II: <mark>Technologies of the World Wide Web</mark>- Internet client-server application-Telnet, PTP, IRC, Chat, ICQ & MIME, Networks & Internet :communication switching -Network routers-URL-IPv6-TCP web site-Website goals & Objectives Strategies for website Development-ISP Broadband Technologies-Hypertext- JavaScript and XML

Unit-III: <mark>E-Marketing</mark>- Traditional Marketing, Online Marketing- Advantages of online Marketing - Advertisements in E-commerce- various means of advertising- advertisement strategies-Intelligent Agents.

Unit-IV: <mark>CRM-</mark>Traditional methods-Technology support-E-CRM-Customer Life Cycle- CRM Capabilities and Customer Life Cycle-Data Mining in CRM - e-Supply Chain- Old ways of Managing supply and information flow-new ways of managing supply chain- several ways to reduce inventory-Real time benefits of e-Supply Chain- objectives of SCM -E-supply chain Components and architecture-Major trends in E-SCM

Unit-V: <mark>E-Commerce Payment Systems</mark>-Electronic Payments with Protocols-Security schemes-Electronic Fund Transfer and Debit Cards-E-Cash, Properties of E-Cash-E-Cash in Action- Operational Risk and E-Cash-Legal issues- E- Cheque - Risk and E-Payments Systems- Cashless Economy

AG&SG SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE VUYYURU
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HUMAN VALUES AND ETHICS (1L + 1T + 1P)

Unit – I: Introduction –Need, Basic Guidelines and Content
1. Understanding the need , basic guidelines, content and process for value Education
2. Self-Exploration – What is it? – its content and process: 'Natural Acceptance' and
Experiential Validation – as the mechanism for self-explanation
3. Continuous Happiness and Prosperity – A look at basic Human Aspirations

Unit – II: Process for Value Education
1. Right Understanding, Relationship and Physical Facilities – basic requirements for
fulfillment of aspirations of every human being with their correct priority
2. Understanding Happiness and prosperity correctly – A critical appraisal of the current
Scenario 17
3. Method to fulfill the above human aspirations; understanding and living in harmony at
various levels

Unit – III: Understanding Harmony in the Human Being
1. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
2. Understanding the needs of Self ('I') and 'Body'
3. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)

Unit –IV: Harmony in Myself
1. Understanding the characteristics and activities of 'I' and harmony in 'I'
2. Understanding the harmony of I with the Body - correct appraisal of Physical needs, meaning of Prosperity in detail
3. Programs to ensure Sanyam and Swasthya – practice exercises and Case Studies will be
taken up in Practice Sessions.

**Unit – V: Understanding Harmony in the Family and Society – harmony in Human -
Human Relationship**
1. Understanding harmony in the family – the basic unit of human interaction
2. Understanding values in human relationship; meaning of Nyaya and Program for its
fulfillment to ensure Ubhay-tripti
3. Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.

AG & SG SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE (AUTONOMOUS), VUYYURU.

COOE301 - DISASTER MANAGEMENT

Unit-I: Disaster:Introduction, Types of Disaster – Natural and Manmade, Introduction, causes, important examples, effects, management.Blizzards – Introduction, causes, important, examples,effects,management.

Unit-II: Introduction, causes, importantexamples, effects, and management of famines, storms, cyclones, floods.

Unit-III: Introduction, causes, importantexamples, effects, andmanagement of earthquakes, tsunamis, landslides.

Unit- IV: Introduction, causes, important examples, effects, and management of volcanic eruptions, lightning strikes, limniceruption, wildfires/bushfires.

Unit- V: Introduction, causes, importantexamples, effects, andmanagement of epidemics, mining, nuclear, chemical and biological.

M. COM (Final Year) III SEM SYLLABUS

CO301- FINANCIAL ACCOUNTING AND PACKAGES

Unit-I: Introduction to Accounting: Concept – Importance and scope – Generally Accepted Accounting Principles – Objectives, Nature and Scope of Financial Accounting. – Cost Accounting – Management accounting.

Unit-II: Preparation of Financial statements: Income statement and Balance sheet – BankReconciliation Statement – Inventory valuation and Depreciation.

Unit-III: Financial Analysis: Objectives – Ratio Analysis – Funds Flow & Cash Flow Analysis.

Unit- IV: Management Accounting: Marginal Costing – CVP analysis – Standard costing and Variance analysis.

Unit- V: Accounting Package- Tally (Theory and practical)

PAPER TITLE: CO301- FINANCIAL ACCOUNTING AND PACKAGES

BUSINESS COMMUNICATION

Unit-I: <mark>Business Correspondence: Significance</mark> - Formal, informal and semiformal correspondence – Describing company activities and structures – Describing job responsibilities – Written Correspondence - Differences between formal and informal writings – Use of formal vocabulary and functional language in business letter writing – Planning effective business letters and responses – e-mail writing skills, call taking etiquette/skills.

Unit-II: <mark>Business Information: Completing of Forms</mark> - Asking appropriate questions to gather information–Polite phrases of confirmation and communication breakdown- understanding native speaking accents and dialects; Functional language used in making verbal agreements —Effective techniques of making and accepting offers – Efficient written offer making and accepting.

Unit-III: <mark>Business Presentations: Basic presentation techniques</mark> – Use of information in presenting product features – Explaining technical features for simplification; Giving and interpreting numerical data, Business abbreviations and acronyms - Oral and written conventions for expressing numerical information in English.

Unit-IV: <mark>Business Reporting: Effective presentation of oral and written instructions</mark> – Presenting and describing company information: Vocabulary of describing graphical and numerical information – Summarizing important information concisely

.
Unit-V: <mark>Feedback and Evaluation</mark>: Giving feedback to others - Use of questions in self-assessment elicitation – Functional language of agreement/disagreement and opinion giving –

CORPORATE ACCOUNTING

Unit - I: <mark>Corporate Financial Accounting: Objectives-Scope</mark> - Role of Corporate AccountantAnalysis and Interpretation of Financial Statements - Inflation Accounting.

Unit - II: <mark>Valuation of Shares</mark>: Need for Valuation of Shares – Factors Effecting Value of Shares – Methods of Valuation – Impact of Earnings on Share Valuation – Role of Fundamental Analysis and

Technical Analysis in Share Valuation – Fair Value of a Share – Buy Back of Equity Shares.

Unit - III: Financial Reporting: Concept, Objectives – Users of Financial Reporting and Specific Purpose of Report – Difficulties in Corporate Reporting– Interim Reporting – Problems –Improving Financial Reporting – Value Added Statements – Disclosure of Value Added Statements – Economic Value Added.

Unit - IV: Consolidated Financial Statements: Definition of Parent or Holding and its Subsidiary – Need for Consolidated Financial Statement – Preparation of Consolidated Balance Sheet of a Holding Company with one Subsidiary – Consolidation of Profit of Loss Account –Consolidated Statement of Changes in Financial Position.

Unit-V: New trends in Accounting: Human Resource Accounting - Environmental Accounting, Social Responsibility Accounting etc.

CO304-DIRECT TAXES

UNIT -I : Income Tax Act 1961: Basic Concepts, Income, Agriculture Income - Residential Status and Incidence of Tax - Incomes Exempt from Tax u/s 10.

UNIT-II : Heads of Income of Individuals; Salaries- income from house property and gain from business or profession, capital gains.

UNIT-III: Head of income from other sources, clubbing up of income set off and carry forward of losses, deductions from gross total income, computation of total income and tax liability.

UNIT- IV: Assessment of Individuals, Hindu Undivided Families, Firms, Association of Persons, Cooperative Societies and Companies.

UNIT – V: Tax Administration; Income Tax Authorities, Assessment procedure, collection and recovery of tax, refunds, penalties and procedures, appeals and revisions.

CO305- ADVANCED BANKING

UNIT – I : Central Banking Concept – Central Banking Policy in Developed and Developing Economies – Functions – Note issues – Banker to the Government; Banker to Commercial Banks – Credit Control – Techniques -Structure and Organization of RBI – Role of RBI as Central Bank.

UNIT – II: Structure and Organization of Central Bank in India, USA, UK and EU–Objectives – Central Banking Policy in Developed and Less Developed Countries – A Critical Study of Theory and Practice of Central Banking in India, USA and UK.

UNIT – III: Development of Commercial Banking in UK, USA and India – Study of Nature and Structure of Commercial Banking in India and Abroad – Theories of Asset Management – Commercial Banks, Recent Developments in Commercial Banking in USA, UK and India.

UNIT – IV : Economic Stabilization Policy: Objectives of Monetary Policy – Choosing Between Conflicting Objectives – Monetary and Fiscal Policies and Economic Stabilization – Interdependence of Monetary and Fiscal Policies – Debt Management Policy.

UNIT – V : Emerging Trends – Technological Advancement in Banking Sector –Challenges and Issues – Next Generation Banking.

CO306- INSURANCE AND RISK MANAGEMENT

Unit-I : Risk Management process – Risk Identification, Evaluation -Risk Management Techniques, Selecting and Implementing Risk Management Techniques – Types of Risks – Insurance and risk.

Unit-II : Commercial Liability Insurance – Commercial Risk Management Applications – Property – Liability – Commercial Property Insurance, Different policies and contracts – Business Liability and Risk Management – Workers compensation and Risk Financing.

UNIT-III : Property and liability Insurance Coverage – Personal Risk Management Applications–Property –Liability – Risk Management for Auto Owners – Risk Management for Home Owners.

UNIT-IV : Risk Management Applications – Loss of Life – Loss of Health – Retirement Planning and Annuities – Employee Benefits – Financial and Estate Planning.

UNIT-V : Risk Management Scenario- Functions and organisation of Insurers – Government Regulation of Insurance Sector – IRDA – Privatization of Insurance – Changes in Insurance Acts – Insurance Intermediaries – Insurance Product pricing and Claim valuation – Bank Assurance–Foreign Insurers in India.

TITLE OF THE PAPER: PROJECT PLANNING AND CONTROL

Semester: IV

UNIT-I

Generation and Screening of Project Ideas – Generation of ideas – Monitoring Environment – Corporate Appraisal – Profit Potential of Industries – Porter Model – Scouting for Project Ideas – Preliminary screening – Project Rating Index – Sources of Positive Net Present Value.

UNIT-II

Market and Demand Analysis: Information required for market and demand analysis; sources of information – primary and secondary; demand forecasting – Technical Analysis – Materials and inputs; Production technology – Product mix – Plant location and layout – Selection of plant and equipment.

UNIT-III

Financial Estimates and Investment Criteria – Cost of Project – Means of Finance – Estimates of sales and production – Cost of Production – Investment Criteria: Net Present Value – Benefit Cost Ratio – Internal Rate of Return – Pay Back Period – and Accounting Rate of Return. Investment Appraisal: Indian Practice.

UNIT-IV

Social Cost Benefit Analysis – Rationale for social cost benefit analysis – Methodology of SCBA – L&M approach and UNIDO approach – Measurement of the impact on distribution – SCBA in India

UNIT-V

Network techniques for Project Implementation – Monitoring and Control – PERT and CPM techniques – Critical path – event slacks and activity floats – Measures of variability and probability of completion by a specified date – Project implementation practices in India.

TITLE OF THE PAPER: INTERNATIONAL BUSINESS
Semester: IV

UNIT–I: International Business: Concept of international business – Stages of internationalization of business – Impact of globalization - International economic, political, legal, competitive, social demographic and cultural frame work - International trade theories.

UNIT –II: International trade regulatory frame work -Trade barriers – Export promotion and import substitution - Role of World Trade Organization (WTO) - Integrity pact.

UNIT –III: International financial frame work - Balance of payments – Foreign exchange market mechanism, export financing, and incentives – Role of MNCs in International Business.

UNIT –IV: International Economic Institutions Agencies and Agreements: Regional Trading agreements – The European Union and NAFTA – Debate on Trade Policy i.e. Free Trade Vs Protectionism.

UNIT –V: Organizing for international business – Designing global organization structure –Developing global competitiveness - EOUs, EPZs - Role of State and Centre to promote international trade

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TITLE OF THE PAPER: MOOCS – OrganisationalBehaviour
Semester: IV

Unit-I: Organizational Behaviour: Meaning, concept, importance and fields of study, roles & skills of managers, Organizational Behaviour challenges, field of OB : individual, groups & systems as building blocks, OB models.

Unit-II: Evolution of Organizational Behaviour, Research of OB, International OB, Perception, Personality, Learning: concept &theories,facilit

Unit-III: Attitude : meaning, concept, formation and change, Motivation : process theories, job satisfaction, emotions and emotional intelligence, formation of groups, types of groups.

Unit- IV: Team dynamics, group decision making, interpersonal relations, Communication : nature, types and barriers, Leadership : nature, importance, styles, theories of leadership, power & politics, conflicts, foundations of organization structure.

Unit- V: Organizational design, diversity and it's management, stress among employees, work life balance, Organizational change & development, Organizational culture, employee empowerment, learning organization, ethical behavior in organization

TITLE OF THE PAPER: INTERNATIONAL BANKING

Semester: IV

UNIT – I :

Introduction- Global trends and developments in International BankingWholesale banking- Retail banking- private banking- inter-bank business

UNIT – II :

International Financial Centres - Offshore Banking units - SEZs- Asset Liability Management-Profitability of International Banking Operations

UNIT – III :

Investment Banking: Wholesale Banking - Unit Banking – Federal Banking System – Investment Banking - Correspondent Banking – Banking System in UK, USA, Germany and Japan - Global trends and developments in International Banking.

UNIT – IV :

International Financial Institutions; IMF , IBRD, BIS, IFC, ADB, WTO, Treasury and Risk Mitigation

UNIT – V :

Regulatory Framework in India and FEMA, Letter of Credit mechanism and UCPDC URC / URR Buyers' / Sellers' credit- Bilateral trade- counter trade- high seas sales.

TITLE OF THE PAPER: FINANCIAL SERVICES

Semester: IV

UNIT – I
Financial Services – Range of services – Characteristics – Institutions offering different services – Characteristics of financial services market – Problems and challenges in financial services marketing.

UNIT – II
Merchant Banking – Nature and scope of merchant banking services – Management of public issues and support services – Depository services – Marketing of services – SEBI guidelines.

UNIT – III
Mutual Funds – Meaning, Origin, Types/Classification of Funds, Importance, Mutual Funds Industry in India – **Venture Capital**: Meaning, Origin, Importance, Methods, India Scenario.

UNIT – IV
Leasing – Concept, Types, Lease Agreements – Potentiality of Leasing as a means of financing – Advantages, and Disadvantages – Lease Financing in India – **Factoring** – Meaning, Modus operandi, types, and functions – Factoring services in India.

UNIT V
Trends in Financial Services – Financial technology firms (Fintech Firms), Data-Driven Product Development, Digital Transformation, AI (artificial intelligence)& Block Chain, Big Data, Cyber Security, Mobile Banking, OMNI-Channel, Investor Education.

TITLE OF THE PAPER: BANKING AND TECHNOLOGY

Semester: IV

UNIT – I
IT in Banking – Information Technology and its implications – Information Technology – Indian Banking Scenario – Initiatives and Trends.

UNIT – II
Applications in Banking – Computer based information System for Banking and Electronic Banking, Electronic Fund Management.

UNIT – III
Enabling Technologies of Modern Banking – Electronic Commerce and Banking – Customer Relationship Management – Integrated Communication Networks for Banks

UNIT – IV
Security and Control Systems – Computer Security and Disaster Management System – Audit and Computer Crime – Security and Control Aspects of Emerging Banking Technologies

UNIT – V:
Planning and Implementation of Information System – Data Warehousing and Data Mining – Designing and Implementing Computerization in Banking Sector

TITLE OF THE PAPER: <mark>INSURANCE PRODUCTS AND MANAGEMENT</mark>

Semester: IV

UNIT – I :

<mark>Life Insurance Concept</mark> – Basic Principles of Life Insurance Utmost Blood Faith – Insurance Interest – Types of Insurance – Variations of Whole Life Insurance – Other typesof Life Insurance.

UNIT – II :

<mark>Life insurance Contractual Provisions</mark> – Dividend Options – Non Forfeiture Options – Settlement Options – Additional Life Insurance Benefits – Insurance Pricing– Rate Making in Life Insurance- objectives.

UNIT – III :

<mark>Health and Disability</mark> – Income – Insurance – Types of Individual Health Insurance Coverage – Individual Medical Expense, Contractual – Group Insurance Plans – Group Medical Expense Insurance.

UNIT – IV :

<mark>Employee Benefits –</mark> Retirement Plans – Fundamentals of Private Retirement Plans – Types of Qualified Retirement Plans – Profit Sharing Plans – Self Retirement Plans for Employed – Single Retirement Plans – Simplified Retirement Pension.

UNIT – V :

<mark>Re-insurance: Reasons for Reinsurance –</mark> Types of Reinsurance – Alternatives to Traditional Reinsurance – Functions of Reinsurance – Advantages and Disadvantages of Reinsurance.

Adusumilli Gopala krishnaiah & Sugar Cane Growers Siddhartha Degree
College ofArts & Science, Vuyyuru, Krishna District, Andhra Pradesh
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DEPARTMENT OF ENGLISH

HIGHLIGHTED SYLLABUS OF ENGLISH

2021-2022

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	2021-2022	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	2021-2022	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

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ENGLISH	SDCENG T01	2021-2022	B.A,B.Com & B.Sc

DEPARTMENT OF ENGLISH

ENRICHING COMM UNICATION SKILLS

SYLLABUS

CONTENTS

UNIT – I: COMMUNICATION PROFICIENCY

1. Formal and Informal conversations (Introducing oneself & others)

2. Contextual conversations (At the bus stop, market, Railway station, Bank, Airport etc)

3. Idiomatic Expressions/Cliché/foreign Expressions/Catch Phrases

UNIT – II: EMPLOYABILITY SKILLS

1. Interview etiquette

2. Group Discussions/Debates/Extempore

3. Oral presentation

UNIT – III: WRITING PROFICIENCY

1. Report Writing – Technical, Non-Technical

2. Essay Writing – Expository, Descriptive, Narrative, Argumentative.

3. Creative Writing – Introduction to Fiction (Novel & Short stories) & Nonfiction (Prose, Poetry & Drama), Anecdotes, Memoirs.

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ENGLISH	ENG 301C	2021-2022	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

Adusumilli Gopalakrishnaiah & Sugar Cane Growers Siddhartha Degree
College ofArts & Science, Vuyyuru, Krishna District, Andhra Pradesh
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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: LST06 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
Course Code:LST01

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

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DEPARTMENT OF ECONOMICS

HIGHLIGHTED SYLLABUS OF ECONOMICS

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

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

B. A. ECONOMICS

2021-2022

MICRO ECONOMIC ANALYSIS

SYLLABUS

Unit-I Economic Analysis and Methodology (15HRS)
1.1 Definitions of Economics
  1.1.1 Wealth Definition (2h)
  1.1.2 Welfare Definition (2h)
  1.1.3 Scarcity Definition (2h)
  1.1.4 Growth Oriented Dynamic Definition- (2h)
 1.2 Methodology in Economics
    1.2.1 Micro and Macro Economics- (3h)
    1.2.2 Deductive and Inductive Methods (3h)
    1.2.3 Production Possibility Curve (PPC) (1h)

Unit-II THEORY OF CONSUMPTION (23HRS)
2.1 Demand Analysis (2h)
    2.1.1 Concept & Factors Determining Demand (2h)
    2.1.2 Law of Demand and Exceptions (1h)
2.2 Elasticity of Demand (1h)
2.2.1 Types of Price Elasticity of Demand (2h)
2.2.2 Methods to measure Price Elasticity of Demand (2h)
2.3 Indifference Curve Analysis
    2.3.1 Indifference Schedule & Indifference map (2h)
    2.3.2 Marginal Rate of Substitution (2h)
    2.3.3 Properties of Indifference curves (2h)
    2.3.4 Budget line & Consumers Equilibrium through Indifference Curve (5h)
    2.3.5 Consumer's Surplus through Indifference Curve Analysis (2h)

Unit-III THEORY OF PRODUCTION (20HRS)
3.1 Concept of Production Function (1h)
3.1.1 Cobb-Douglas Production Function (1h)
    3.1.2 The law of variable proportions (2h)
    3.1.3 The law of Returns to Scale (2h)
    3.1.4 Economies of large Scale Production (2h)
3.2 Concepts of cost (1h)
    3.2.1 Short run Cost Curves (3hrs)
3.3 Law of supply (1hr)
3.4 Revenue Concepts (T.R., A.R. & M.R.) (3hrs)
    3.4.1 Relationship between AR, MR &E.D (2hrs)
    3.4.2 Cost minimization (1h)
    3.4.3 Profit Maximization (1h)

Unit-IV THEORY OF EXCHANGE   **(12HRS)**
4.1   Classification of Markets   (1h)
4.2   Features of Perfect Market Conditions   (2h)
4.3   Price Determination under Perfect Competition Market   (2hrs)
4.4   Features of Monopoly Market   (2h)
4.5   Features of Monopolistic Competition Market   (2h)
4.6   Features of Oligopoly Market   (2h)
4.7   Kinky Demand Curve Analysis   (2hrs)
Unit-V THEORY OF DISTRIBUTION   **(20HRS)**
5.1   Concepts of Functional and Personal Distribution   (2h)
5.2   Marginal Productivity Theory of Distribution   (2h)
5.3   Theories of Rent
         5.3.1   Ricardian Theory of Rent   (1hr)
         5.3.2   Marshall's Economic rent   (2h)
5.4   Theories of Wage
5.4.1   Standard of Living Theory of wages   (1h)
         5.4.2 Modern Theory of wages   (2h)
5.5   Theories of Interest
         5.5.1   Classical Theory of Interest   (2h)
         5.5.2   Loanable Funds Theory of Interest   (2h)
         5.5.3   Keynes Liquidity Preference Theory of Interest (2h)
5.6   Theories of Profit
5.6.1 Risk Theory of Profit   (1h)
5.6.2   Uncertainty Theory of Profit   (1h)
         5.6.3   Dynamic Theory of Profit   (1h)
5.6.4   Innovation Theory of Profit   (1h)

DEVELOPMENT ECONOMICS

Syllabus

Module - 1: Economic Growth and Development

Economic Development as a Branch of Study of Economics – Scope and Importance - Distinction between Economic Growth and Economic Development -Measures of Economic Development and their limitations - Relevance of Herd (Group) Immunity in the context of COVID 19 - three core values of economic development : Sustainability, Self-esteem and Freedom – Economy and Environment : Concepts of sustainable development and inclusive growth

Module -2: Modern Economic Growth

Characteristics of Underdeveloped Countries - World Bank and IMF Classification of countries - Modern economic growth – Kuznets' Six Characteristics -Obstacles to economic development - Vicious Circle of Poverty and cumulative causation -Factors of economic growth: Economic and Non-economic - Capital Formation – Foreign and Domestic capital, Debt and Disinvestment.

Module-3: Theories of Development and Underdevelopment Classical Theory: Adam Smith, Ricardo and Malthus -Marxian Theory - Schumpeter Theory -Rostow's Stages of Economic Growth -Harrod-Domar two sector model -Solow's Model and Robinson's Golden Age

Module – 4: Strategies of Economic DevelopmentStrategies of Economic Development – Big Push - Balanced Growth -Unbalanced Growth - Mahalanobis Model - Agriculture vs Industry -Capital Intensive Technology vs Labour Intensive Technology -Role of Infrastructure in Economic Development

Module - 5: Institutions and Economic Development Role of State in Economic Development -Role of Markets - Market Failure and Regulation by State -Public sector vs Private sector -Economic Planning – concept, objectives and types -NITIAyog - Economic Federalism -Financial Institutions and Economic Development – Role of International Institutions – IDBI, ADB, IMF – Foreign Trade – FIIs and FDIs

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II B.A (HEP) – SEMESTER-III

Financial Markets

(SDCECOT01)

<u>**Total Hours : 30 (2 Hr/w),**</u>   Credits : 02,   Max Marks : 50

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)

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

Final year BA Economics Syllabus Paper – V
INDIAN AND ANDHRAPRADESH ECONOMY – Semester –V

Weekly 5 Hours,   Credits - 4
Paper Code : ECO-502   Semester-5

Indian and Andhra Pradesh Economy

Syllabus

Module - 1
Indian Agriculture - Importance of Agriculture in India - Agrarian structure and relations- Factors determining Productivity- Agricultural Infrastructure - Rural credit - Micro Finance - Self Help Groups (SHGs) - Agricultural Price policy- concept of Crop Insurance - Food Security.

Module - 2
Structure and growth of Indian Industry - Industrial policies of 1956 & 1991 Meaning of Micro small and Medium Enterprises (MSMEs)- Problems and Prospects of small scale Industries in India.

Module - 3
Disinvestment in India - FEMA - Foreign direct investment - Services Sector in India – Reforms in Banking and Insurance -, IT, Education and Health.

Module - 4
Planning in India Economy - Objectives of Five year plans - Review of Five year Plans - Current Five year plan- NITI Aayog

Module - 5
Andhra Pradesh Economy - Population - GSDP - Sector Contribution and trends - IT – Small Scale Industry - SEZs.

REFERENCES:
1.   Dhingra, I.C - "Indian Economy", Sultan Chand, 2014.
2.   RuddarDutt and K.P.M. Sundaram - "Indian Economy", S.Chand& Co., 2015.
3.   G.M.Meier - "Leading Issues in Economic Development", Oxford University Press,   New York, 3/e.
4.   M.P.Todaro - "Economic Development", Longman, London 6/e, 1996.
5.   Reserve Bank of India - Hand book of Statistics on Indian Economy (Latest).
6.   S.K.Misra&V,K,Puri - "Indian Economy", Himalaya Publishing House, 2015.
7.   R.S.Rao, V.HanumanthaRao&N.VenuGopal (Ed) - Fifty Years of Andhra Pradesh   (1956-2006), Centre for Documentation, Research and Communications,Hyderabad,   2007.
8.   G.Omkarnath - Economics - A Primer for India - Orient Blackswan, 2012.
9.   Telugu Academy Publications.
10.   Dr.Ch.S.G.K.Murthy, Indian Economy - Gitam University.

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DEPARTMENT OF HISTORY

2021-2022

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 | | 2021-22 | B.A/HEP |

SEMESTER-1   Course -1

                                                   No. of Credits: 4

NO OF HOURS:-05   MAX MARKS:-75

(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	2021-22	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

HISTORY	HIS-301	2021-22	B.A/HEP

SEMESTER – III   Course- III

                                                                                                    No. of

                Credits: 4
NO OF HOURS:-05   MAX MARKS:-70
MODERN INDIAN HISTORY & CULTURE (1764-1947 A. D) (NEW SYLLABUS)

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

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	2021-22	B.A/HEP

Course: IV
                                                                No. of Credits: 4
NO OF HOURS:-05   **MAX MARKS:-**
70

HISTORY & CULTURE OF ANDHRA (FROM 1512 TO 1956 AD)
(NEW SYLLABUS)

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	2021-22	B.A/HEP

SEMESTER –IV   Course :V

No. of Credits: 4

NO OF HOURS :-05   **MAX MARKS:-**
70

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

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III BA History Syllabus:: Semester – V (CBCS)   Paper – V

Age of Rationalism and Humanism –The World Between 15th & 18th Centuries.

Paper Code; HIS-501   (w .e. f . 2020 - 2021)

No. of Hours per week:5   **No. of Credits:4**

Unit – 1

Feudalism -Geographical Discoveries: Causes – Compass & Maps – Portugal Leads

and Western World Follows – Consequences;(15 Hrs)

Unit – II

The Renaissance Movement: Factors for the Growth of Renaissance – Characteristic

Features - Transformation from Medieval to Modern World; Reformation & Counter

Reformation Movements: The Background – Protestantism – Spread of the

Movement– Counter Reformation– Effects of Reformation(20Hrs)

Unit - III

Emergence of Nation States: Contributory Factors - England and other Nation States

– Impact due to the Emergence of Nation States.; Age of Revolutions: The Glorious

Revolution (1688) – Origin of Parliament – Constitutional Settlement – Bill of Rights

– Results(15Hrs)

.   **Unit – IV**

Age of Revolutions: The American Revolution (1776) – Opening of New World –

Causes – Course – Declaration of Independence, 1776 – Bill of Rights, 1791 – Significance(20Hrs).

Unit – V

Age of Revolutions: The French Revolution (1789) – Causes - Teachings of

Philosophers - Course of the Revolution – Results(20Hrs)

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III BA. Semester – V (CBCS) Paper – VI

Subject:: History : Syllabus - Title of the Paper – History & Culture of Andhra Desa (from 12th to 19th Century A.D)

Paper Code : HIS-502   (w .e. f 2020 - 2021)

No. of Hours per week:5   **No. of Credits:4**

Unit – 1

 Andhra during 12th& 13th Centuries A.D.: Kakatiyas – Origin & its Antecedents – Administration – Social & Economic Life – Industries & Trade - Promotion of Literature and Culture – Architecture & Sculpture – Decline; The Age of Reddy Kingdoms: Patronage to Literature – Trade & Commerce.(20Hrs)

Unit – II

Andhra between 14th & 16th Centuries A.D.: Vijayanagara Empire: Polity, Administration, Society & Economy – Sri Krishna Devaraya and his contribution to Andhra Culture –Development of Literature & Architecture – Decline and Downfall.(15Hrs)

Unit - III

Andhra through 16th& 17th Centuries A.D.: Evolution of Composite Culture – The QutbShahis of Golkonda – Origin & Decline – Administration, Society & Economy –Literature & Architecture.(15Hrs)

Unit – IV

 The 18th& 19th Centuries in Andhra: East India Company's Authority over Andhra – Three Carnatic Wars – Occupation of Northern Circars and Ceeded Districts –Early Uprisings – Peasants and Tribal Revolts.(20Hrs)

Unit – V

The 18th& 19th Centuries in Andhra: Impact of Company Rule on Andhra – Administration – Land Revenue Settlements – Society – Education - Religion – Impact of Industrial Revolution on Economy – Peasantry & Famines – Contribution of Sir Thomas Munroe, C. P. Brown & Sir Arthur Cotton – Impact of 1857 Revolt in Andhra.(20Hrs)

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(AN AUTONOMOUS COLLEGE IN THE JURISDICTION OF KRISHNA UNIVERSITY, MACHILIPATNAM)

III BA   **Semester – VI (CBCS)**   **Paper – VII (General Elective)**

Subject: **History**

Syllabus: Title of the Paper – **History of Modern Europe (from 19th Century to 1945 A.D)**

Paper Code ; **HIS-601GE**   (w .e. f 2020 - 2021)

No. of Hours per week:5   **No. of Credits:4**

UNIT – 1

Industrial Revolution: Origin, Nature and Impact.   (10 Hrs)

UNIT – II

Unification Movements in Italy & Germany and their Impact.   (25 Hrs)

UNIT – III

Communist Revolution in Russia – Causes, Course and Results – Impact on World
Order.   (15 Hrs)

UNIT - IV

World War I: Age of Rivalry in Europe between 1870 and 1914 – Results of the War – Paris Peace
Conference - League of Nations.   (20 Hrs)

UNIT – V

World War II: Causes, Fascism & Nazism – Results; the United Nations Organization: Structure,
Functions and Challenges.   (20 Hrs)

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DEPARTMENT OF HINDI

2021-2022

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

AG & SG SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE, VUYYURU

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

HINDI	HINT11A	2021-'22	B.A.,B.Com.,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 अन्नवाद 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	Hindi - 301 C	2021-22	II Degree
	Syllabus for B.A., B.Com., B.Sc		
	III Semester - Hindi		

पाठ्य पुस्तक = काव्य दीप

A) पुरानी कविता =
1. कबीरदास साखी
2. सूरदास का बाल वर्णन

B) आधुनिक कविता =
1. मातृभूमि
2. तोडती पत्थर
3. मातृभाषा के प्रति

C. हिन्दी साहित्य का इतिहास = भक्तिकाल
1. ज्ञानाश्रयी शाखा- कबीरदास
2. प्रेमाश्रयी शाखा - जायसी

D) सामान्य निबंध
1. सामाचार पत्र
2. बेकारी की समस्या
3. कंप्यूटर
4. पर्यावरण और प्रदूषण
5. साहित्य और समाज

E) अनुवाद = अंग्रेजी से हिन्दी
5 sentences from prescribed text book

F) कार्यालय हिन्दी =
1. परिपत्र
2. ज्ञापन
3. सूचना

* * *

A.G. & S.G. SIDDHARTHA SCIENCE & ARTS DEGREE COLLEGE, VUYYURU

An Autonomous College in the jurisdiction of Krishna University, Machilipatnam

Hindi	Hindi - 201C	2021-22	I Degree

SYLLABUS FOR B.A., B.COM., B.Sc.

II Semester - Hindi

Text Book	Gadya Sandesh
1. गद्य संदेश (Prose)	1. संस्कृति और साहित्य का परस्पर संबंध 2. भारत एक है 3. ऐच.आइ.वी (एड्स)
2. कथा लोक (Non-detailed)	कथा लोक 1. जरिया 2. भूख हडताल 3. परमात्मा का कुत्ता
3. व्याकरण (Grammar)	1. शब्दों का प्रयोग 2. संधिविच्छेद 3. शुद्ध करके लिखना
4. अनुवाद (Translation)	हिन्दी से अंग्रेजी
5. पत्र लेखन (Letter Writing)	अधिकारिक पत्र

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 MATHEMATICS

HIGHLIGHTED SYLLABUS OF MATHEMATICS
2021-2022

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

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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) 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.

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NAAC reaccredited at 'A' level
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) Vector Spaces-I:

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) Vector Spaces-II:

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) Linear Transformations:

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
(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)
Accredited with "A" Grade by NAAC, Bengaluru

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

A.G & S.G SIDDHARTHA DEGREE COLLEGE: VUYYURU-521165

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

Accredited with "A" Grade by NAAC, Bengaluru

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

A.G & S.G SIDDHARTHA DEGREE COLLEGE: VUYYURU-521165

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

Accredited with "A" Grade by NAAC, Bengaluru

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	2021 – 22 onwards	B.Sc (MPC, MPCS, MCCS, MSCS)

DIFFERENTIAL EQUATIONS

SEMESTER-I   **No of Credits: 5**

OBJECTIVES:
1. Understand all of the concepts relating to the order and linearity of ODEs, analytic and computational solution methods for ODEs, and the real-world applications ofODEs.
2. Apply your understanding of the concepts, formulas, and problem-solving procedures to thoroughly investigate relevant physicalmodels.
3. Explain the concepts of linear systems, ODE solution methods, and related ideas at a fundamental level, as well as how and why we use the solution techniques that weuse.

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 withconstantcoefficients
Solution of the non-homogeneous linear differentialequations 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 linear differential equations-II   **(12Hrs)**
Solution of the non-homogeneous linear differential equations withconstantcoefficients.
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.

Chairman	University Nominee	Subject Expert	Subject Exper

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: 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.

Chairman   University Nominee   Subject Expert   Subject Expert

HOMOMORPHISM :

Definition of homomorphism – Image of homomorphism elementary properties of homomorphism – Isomorphism – automorphism definitions and elementary properties–kernel of a homomorphism – fundamental theorem on Homomorphism and applications.

UNIT – IV: PERMUTATIONS AND CYCLIC GROUPS :   **(12 Hours)**

Definition of permutation – permutation multiplication – Inverse of a permutation – cyclic permutations – transposition – even and odd permutations – Cayley's theorem.

Cyclic Groups :- Definition of cyclic group – elementary properties – classification of cyclic groups.

UNIT – V: RINGS :   **(12 Hours)**

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 and Ideals (only definitions)

Co-Curricular Activities (15 Hours)

Seminar/ Quiz/ Assignments/ Group theory and its applications / Problem Solving.

Text Book:

A text book of Mathematics for B.A. / B.Sc. by B.V.S.S. SARMA and others, published by S.Chand & Company, New Delhi.

Reference Books:

1.   Abstract Algebra by J.B. Fraleigh, Published by Narosa publishing house.
2.   Modern Algebra by M.L. Khanna.
3.   Rings and Linear Algebra by Pundir & Pundir, published by Pragathi Prakashan.

A.G & S.G SIDDHARTHA DEGREE COLLEGE OF ARTS AND SCIENCE, VUYYURU-521165, KRISHNA Dt, A.P.

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

Accredited with "A" Grade by NAAC, Bengaluru

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.

& 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**

Course Objective: Intended to inculcate quantitative analytical skills and reasoning as an inherent ability in students.

Course Outcomes:

After successful completion of this course, the student will be able to;

1) Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.

2) Acquire competency in the use of verbal reasoning.

3) Apply the skills and competencies acquired in the related areas

4) Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

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, VUYYURU-521165

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

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

Chairman   University Nominee   Subject Expert   Subject Expert

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"

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" GradeISO 9001:2015 Certified Institution

DEPARTMENT OF PHYSICS

HIGHLIGHTED SYLLABUS OF PHYSICS
2021-2022

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, Vuyyuru

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Autonomous -ISO 9001 – 2015 Certified
DEPARTMENT OF PHYSICS
2021-22

PHYSICS	PHY-101C	2021-2022	B.Sc. (MPC&MPCs)

Semester-I

Work load: 60 hrs per semester   4 hrs/week   **Credits** – 4

MECHANICS, WAVES AND OSCILLATIONS

UNIT-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

Unit-II:

3. **Motion in a Central Force Field** (12hrs)

Central force - definition and examples, characteristics of central forces, conservative nature of central forces, Equation of motion under a central force, Kepler's laws of planetary motion- Proofs, Motion of satellites – escape velocity, orbital velocity, Basic idea of Global Positioning System (GPS),

UNIT-III:

4. **Relativistic Mechanics** (12 hrs)

Introduction to relativity, Frames of reference - Galilean transformations, absolute frames, Michelson-Morley experiment & negative result, Postulates of Special theory of relativity, Lorentz transformation, time dilation, length contraction, variation of mass with velocity, Einstein's mass-energy relation

Unit-IV:

5. **Undamped, Damped and Forced oscillations**: (07 hrs)

Simple harmonic oscillator, Damped harmonic oscillator, Forced harmonic oscillator – differential equations and solutions, Resonance, Logarithmic decrement, Relaxation time and Quality factor.

6. **Fourier analysis (05 hrs)**

Fourier theorem (Statement & limitations), evaluation of the Fourier coefficients using Fourier's theorem, analysis of periodic wave   functions - square wave, triangular wave.
Unit-V:

7. **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.

8. **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

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
2021-22

PHYSICS	PHY-301C	2021-2022	B.Sc. (MPC&MPCs)

Semester-III

Work load: 60 hrs per semester   4 hrs/week   **Credits** – 4

Paper-III   *THERMODYNAMICS AND RADIATION PHYSICS*

UNIT-I:

Kinetic Theory of gases: (12 hrs)

Kinetic Theory of gases-Introduction, Maxwell's law of distribution of molecular velocities (qualitative treatment only), Mean free path, Degrees of freedom, Principle of equipartition of energy (Qualitative ideas only), Transport phenomenon in ideal gases: viscosity, Thermal conductivity and diffusion of gases.

UNIT-II:

Thermodynamics: (12hrs)

Introduction- Isothermal and Adiabatic processes, Reversible and irreversible processes, Carnot's engine and its efficiency, Carnot's theorem, Thermodynamic scale of temperature and its identity with perfect gas scale, Second law of thermodynamics - Kelvin's and Clausius statements; Entropy, 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).

UNIT-III:

Thermodynamic Potentials and Maxwell's equations: (12hrs) (NO PROBLEM)

Thermodynamic potentials-Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy and their significance, Derivation of Maxwell's thermodynamic relations from

thermodynamic potentials, Applications to (i) Clausius-Clayperon'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

UNIT-IV:

Low temperature Physics: (12hrs)

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, Production of low temperatures by adiabatic demagnetization (Derivation), Principle of Refrigeration, effects of chloro and fluoro carbons on ozone layer.

UNIT-V:

Quantum theory of radiation: (12 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, Solar constant and its determination using Angstrom pyroheliometer, Estimation of surface temperature of Sun.

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

III B.Sc. 5th Semester
Paper V: Electricity, Magnetism and Electronics

Work load:60 hrs per semester   **4 hrs/week**   **Course Code : PHY 501C**

Unit – I(12hrs)
1.Electrostatics
Gauss's law Statement and its proof-Electric field intensity due to (1) Uniformly charged sphere and (2) an infinite conducting sheet of charge. Electric potential- Equipotential surface –potential due to i) a point charge ii)charged spherical shell .

2.Dielectrics
Electric dipolement and molecular polarizability- Electric displacement D, electric polarization P – relation between D, E, and P- Dielectric constant, susceptibility .

Unit – II(12hrs)
3. Electric and magnetic field   Biot – Savart's law and calculation of B due to long straight wire, a circular current loop and solenoid.   Hall effect-determination of Hall coefficient and applications.

4.Electromagnetic-induction
Faraday's law – Lenz's law self and mutual inductance, coefficient of coupling, calculation of self inductance of a long solenoid, energy stored in magnetic field. Tansformer- energy losses and efficiency.

Unit-III(12hrs)
5.Alternating current and electro magnetic waves
Alternating current –Relation between current and voltage in LR and CR circuits, vector diagrams, LCR series and parallel resonant circuit , Q- factor, power in AC circuits.

6.Maxwell's equations
 Idea of displacement current- Maxwell's equations (integral and differential forms) (no derivation) Maxwell's wave equation(with derivation), Transverse nature of electromagnetic wave. Pointing Vector (statement and proof) production of electromagnetic wave Hertz experiment.

Unit-IV(12hrs)
7.Basic electronics:
PN junction diode Zener diode ,I-V characteristics, PNP and NPN Transistors, CB,CE and CC configuration Relation between α β and Γ transistors (CE) characteristics,Transistor as an amplifier.

 Unit-V(12hrs)
Digital electronics:
Number systems-conversion of binary to decimal system and vice versa. Binary addition and subtraction (1's and 2's complement methods) laws of Boolean algebra-De Morgan's laws-statement and proof basic logic gates, NAND and NOR as universal gates Half adder and FULL adder.

Practical paper V: Electricity, Magnetism and Electronics
Exam duration : 3Hours   Maximum marks : 50 marks

Work load:30hrs
Minimum of 6 experiments to be done and recorded

1 .Figure of merit of a moving coil galvanometer.
2. LCR circuit series/parallel 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.
6. PN Junction diode Characteristics
7. characteristics of Zener diode
8. Transistor CE Characteristics.
9. Logic Gates –OR ,AND, NOT,and NAND gates verification of truth tables.
10 .Verification of De Morgan's theorems.

III B.Sc. Physics – V Semester
Paper –VI
Modern Physics

Course Code : PHY 502C   **Work Load : 60 hrs per semester**
4 hrs/week

Unit – I (12 hrs)
1. Atomic and molecular physics

Introduction – Drawbacks of Bohr's atomic model – Sommerfeld's elliptical orbits-relativistic correction (no derivation). Vector atom model and Stern & Gerlach experiment - quantum numbers associated with it. L-S and j-j coupling schemes. Zeeman Effect and its experimental study.

Raman effect, stokes and Anti stokes lines . Quamtum theory of Raman effect. Experimental arrangement – Applications of Raman effect.

UNIT – II (12 hrs)   2. Matter waves & Uncertainty Principle

Matter waves, de Broglie's hypothesis – wavelength of matter waves, Properties of matter waves – Davisson and Germer experiment, uses of electron diffraction-Phase velocity and Group velocity (definitions only)- relation between phase velocity and Group velocity– Heisenberg's uncertainty principle for position and momentum (x and p) & energy and time (E and t). Experiment verification.

UNIT – III (12 hrs)   3.Quantum (wave) mechanics

Basic postulates of quantum mechanics – Schrodinger time independent and time dependent wave equation – derivations. Physical interpretation of wave function. Applications of Schrodinger wave equation to particle in one dimensional infinite box. Harmonic oscillator.

UNIT – IV (12 hrs)   4.General properties of Nuclei

Basic ideas of nucleus – size,mass,charge density(matter energy), binding energy,angular momemtum, parity, magnetic moment, electric quadrupole moments.Liquid drop model and shell model (qualitative aspects only)- Magic numbers.

5. Radioactivity decay

Alpha decay : basis of α – decay processes. Range of α-particles , Geiger"s Law,Geiger-Nuttal law. β – decay, β ray continuous and discrete spectrum, neutrino hypothesis.

UNIT – V (12 hrs)
6.Crystal structure

Amorphous and crystalline materials, unit cell, Miller indices, reciprocal lattice, types of lattices, diffraction of X- rays by crystals, Bragg's law, experimental techniques, Laue's method and powder diffraction method.

7. Superconductivity:

Introduction – experimental facts, critical temperature – critical field – Meissner effect – isotope effect – Type I and Type II superconductors – BCS theory (elementary ideas only) – applications of superconductors.

Practical Paper VI : Modern Physics

Exam duration : 3Hours   Maximum marks : 50 marks

Work load : 30 hrs   **3 hrs.**

Minimum of 6 experiments to be done and recorded

1. e/m of an electron by Thomson method.
2. Determination of Planck's Constant (photocell)
3. Verification of inverse square law of light using photovoltaic cell.
4. Study of absorption of α – rays.
5. Study of absorption of . β – rays.
6. Determination of range of β – particles.
7. Determination of M & H.
8. Analysis of powder X- ray diffraction pattern to determine properties of crystals.
9. Energy gap of semiconductor using junction diode.
10. Energy gap of a semiconductor using Thermistor.

DEPARTMENT OF PHYSICS
I B.Sc. 2nd Semester

(2021-2022)

Paper II: Waves Optics   II SEMESTER

Work load: 60 hrs per semester   credits - 3   4 hrs/week

UNIT-I Interference of light: (12hrs)

Division of Wave front: Introduction, Conditions for interference of light, Interference of light by division of wave front and amplitude, Phase change on reflection- Stokes' treatment, Fresnel's Bi-Prism-Determination of Wavelength of Light.

Division of Amplitude: Cosine law - colors in thin films, Newton's rings in reflected light-Theory and experiment - Determination of wavelength of monochromatic light, Michelson interferometer and determination of wavelength.

UNIT-II   Diffraction of light: (12hrs)

Fraunhofer Class: Distinction between Fresnel and Fraunhoffer diffraction,Fraunhoffer diffraction at a single slit, Double slit and N-slits(No Derivation for N-Slits), Determination of wavelength of light using diffraction grating, Resolving power of grating,

Fresnel's Class: Fresnel's half period zones, Zone plate, comparison of zone plate with convexlens.

UNIT-III   Polarisation of light: (12hrs)

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

Types and production of polarized Light: Quarter wave plate, Half wave plate, Plane, Circularly and Elliptically polarized light-Production and detection, Optical

activity, Laurent's half shade polarimeter: determination of specific rotation

UNIT-IV **(12hrs) Aberrations**: 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 adistance.

FibreOptics: 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 opticcommunication.

UNIT-V **Lasers and Holography :** **(12hrs)**

Lasers: Introduction, Spontaneous emission, stimulated emission, Population Inversion, Laser principle, Einstein coefficients, Types of lasers-He-Ne laser, Ruby laser, Applications of lasers;

Holography: Basic principle of holography, Applications of holography

LIST OF PRACTCALS

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 ofgrating.
3. Study of optical rotation–polarimeter.
4. Dispersive power of aprism.
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 atelescope.
8. Refractive index of a liquid-hallowprism
9. Determination of thickness of a thin wire by wedgemethod
10. Determination of refractive index of liquid-Boy'smethod.

DEPARTMENT OF PHYSICS
II B.Sc. 4th Semester

(2021-22)

Paper IV: ELECTRICITY, MAGNETISM AND ELECTRONICS

Work load:60 hrs per semester   credits - 3   **4 hrs/week**

UNIT-I

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

Dielectrics: **(6 hrs)**

Dielectrics-Polar and Non-polar dielectrics- Electric displacement D, electric polarization P,Relation between D, E and P, Dielectric constant and electric susceptibility.

UNIT-II

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.

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 magnetic field, Eddy currents and Electromagnetic damping

UNIT-III

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.

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)

UNIT-IV

Basic Electronic devices: (12 hrs)

Diodes: PN junction diode, Zener diode and Light Emitting Diode (LED) and their I-V characteristics, Zener diode as a regulator

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.

UNIT-V :

Digital Electronics : (12 hrs)

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.

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 adders-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.

DEPARTMENT OF PHYSICS

II B.Sc. 4th Semester

(2021-22)

Paper IV: MODERN PHYSICS

Work load :60 hrs per semester   credits - 3   **4 hrs/week**

UNIT-I

A. 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, Fine structure of Sodium D-lines, Zeeman effect, Experimental study of Zeeman effect

B. Molecular Physics (05 hrs) Raman effect, Characteristics of Raman effect, Experimental study of Raman effect, Quantum theory of Raman effect, Applications of Raman effect.

UNIT-II

A. 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),

B. 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.

UNIT-III

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 12 equation to one dimensional potential box of infinite height (Infinite Potential Well)

UNIT-IV

Structure of Nuclei and Nuclear Models: (06 hrs)

Nuclear Structure: General Properties of Nuclei, Mass defect, Binding energy; Nuclear forces, Characteristics of nuclear forces, Yukawa's meson theory (Qualitative), Nuclear Models: Liquid drop model, Shell model, Magic numbers.

Elementary Particle Physics (06 hrs)

Elementary Particles and their classification, Fundamental Interactions – gravitational, electromagnetic, strong & week; Properties of Leptons, Mesons andBaryons

UNIT-V

Nano materials: (07hrs)

Origin of Nano materials - Quantum confinement, Size effect, Surface to volume ratio, Classification of nano materials - (0D, 1D, 2D); Nano wires, Fullerene, CNT, Graphene (Mention of structures and properties), Distinct properties of nano materials (Mention-mechanical, optical, electrical, and magnetic properties); Applications of nano materials: (Fuel cells, Phosphors for HD TV, Sensors)

B. Superconductivity: (05 hrs)

 Introduction – Properties of superconductors - critical temperature (Tc), critical magnetic field (Tm), Meissner effect, Isotope effect, Type I and Type II superconductors, BCS theory (Qualitative), High Tc superconductors, Applications of superconductors.

Practical Paper VI : Modern Physics

Exam duration : 3Hours   Maximum marks : 50 marks

Work load : 30 hrs   3 hrs.

Minimum of 6 experiments to be done and recorded

1. e/m of an electron by Thomson method.

2. Determination of Planck's Constant (photocell)

3. Verification of inverse square law of light using photovoltaic cell.

4. Study of absorption of α – rays.

5. Study of absorption of . β – rays.

6. Determination of range of β – particles.

7. Determination of M & H.

8. Analysis of powder X- ray diffraction pattern to determine properties of crystals.

9. Energy gap of semiconductor using junction diode.

10. Energy gap of a semiconductor using Thermistor.

DEPARTMENT OF PHYSICS
III B.Sc. Physics – VI Semester – Paper –VII
(2021-2022)

Elective VII (A):   Course Code: PHY – 601GE

SEMISTER-VI   credits - 3   4 hrs/week

ELECTIVE PAPER –VII-A: ANALOG AND DIGITAL ELECTRONICS

UNIT- I (14 hours)   Total Lectures: 60 hours

1. FET Construction ,Working ,Characteristics and uses; MOSEFT-enhancement MOSEFT,Depletion MOSEFT, Construction and Working, drain Characteristics of MOSEFT, applications of MOSEFT.
2. Photo electric devices: structure and operation, Characteristics and applications of LED and LCD.

UNIT- II (10hours)

3. Operational amplifier: Characteristics of ideal and practical OP-amp (IC-741),Basic differential OP-amp supply voltage, IC identification, internal blocks of OP-amp, its parameter off set voltages and currents, CMRR, slew rate, Concept of Virtual ground.

UNIT- III (10hours)

4. Applications of OP-amp: OP-amp as voltage amplifier, inverting amplifier, Non- inverting amplifier, Voltage follower, summing amplifier, difference amplifier, comparator, Integrator, Differentiator.

UNIT- IV (14hours)

5. Data processing circuits: Multiplexers, De –Multiplexers, encoders, decoders, Characteristics

6.For Digital IC's –RTL, DTL,TTL, CMOS (NAND&NOR Gates).

UNIT- V (12hours)

1. Sequential digital circuits: Flip-flops, RS, clocked SR, JK, D, T, Master-Slave Flip-flops .
2. Counters: Asynchronous counters-modulo 4counter-modulo 16 ripple counter, Decade counter, Synchronous counter.

ELECTIVE PAPER –VII PRACTICAL :

ANALOG AND DIGITAL ELECTRONICS

credits – 2   2 Hours per week

Minimum of 6 experiments to be done and recorded

1. Characteristics of FET

2. Characteristics of MOSEFT

3. Characteristics of LDR

4. Characteristics of OP-amp.(IC-741)

5. OP-amp as amplifier/inverting amplifier

6. OP-amp as integrator/differentiator

7. OP-amp as summing amplifier /difference amplifier

8. Master-Slave Flip-flop

9. JK Flip-flop

III B.Sc. Physics – VI Semester – Paper –VIII
(2021-22)

SEMISTER-VI   Course Code: PHY -602 CE   credits - 3   4 hrs/week

CLUSTER ELECTIVES VIII-A
PAPER-VIII-A-1: <u>INTRODUCTION TO MICROPROCESSOR AND MICROCONTROLLER</u>

UNIT- I (10hours)
MICROPROCESSOR:
General architecture of microprocessor, architecture of 8085 microprocessor, 8085 pin diagram, Concept of data bus, address bus, and control bus, 8085 programming instruction classification.

UNIT-II: (10hours)
8085 Interfacing Memory
Introduction-Memory structure and its requirements-basic concepts in memory interfacing. Address Decoding-Interfacing circuit. Port-mapped I/O or Direct I/O interface (8-bit Addressing)-Memory Indirect I/O mapped Interfaces (16-bit Addressing)-Port mapped versus Memory mapped I/O. I/O Device Interfacing.

UNIT-III (15hours)
8085 Microprocessor Applications
Introduction-Programmed data transfer scheme. Direct Memory Access (DMA) – Types. 8255A PPI-Block diagram. 8259A PIC-Pin diagram and functional description. 8257 Programmable DMA controller-Block diagram and Pin description.

UNIT-IV: (13hours)
8051 Architecture-I:
Types of microcontrollers- microcontroller architecture, CISC, RISC, operation of microcontroller, basic building blocks of microcontroller, comparison of microcontroller and microprocessor- block diagram of 8051-I/o pins and ports. Microcontroller Resources.

UNIT-V: (12hours)
8051 Architecture-II:
8051 Flag bits and PSW register and DPTR register- Memory Organization- Special function registers- PSW register-Counters and Timers-Serial I/O-8051 Microcontroller Interrupts.

PAPER-VIII-A-1: Practical:

INTRODUCTION TO MICROPROCESSOR AND MICROCONTROLLER

credits – 2   2 Hours per week

Minimum of 6 experiments to be done and recorded

1. To find that the given number is prime or not.

2. To find the factorial of a number.

3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.

4. Use one of the four parts of 8051 for O/P interfaced to eight LED's simulate binary counter (8 bit) on LED's.

5. Program to glow first four LED then next four using TIMER application.

6. Program to rotate the contents of the accumulator first right and then left.

7. Program to run a count down from 9-0 in the 7 segment LED display.

8. To interface 7 segment LED display with 8051 Microcontroller and display 'HELP' in the 7 segment LED display.

9. To toggle '1234' as '1324' in the 7 segment LED.

10. Interface stepper motor with 8051 and write a Program to move the motor through a given angle in clock wise or counter clock wise direction.

11. Application of Embedded system: Temperature measurement, some information on LCD display, interfacing a key board.

DEPARTMENT OF PHYSICS
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Autonomous -ISO 9001 – 2015 Certified
III B.Sc. 6th Semester

(2021-22)

COURSE CODE : PHY-603 CE   credits - 3

Cluster Elective Paper – <u>VIII- A-2</u> : <u>Computational Methods and Programming</u>

No. of Hours per week : 04   Total Lectures : 60

UNIT – I (12 hrs)
    1. Fundamentals of C language: C character set – Identifiers and keywords – structure of c program. Constants- variables- Data types- Declarations of variables – Declaration of storage class – Defining symbolic constants – Assignment statement.
    2. Operators : Arithmetic operators- Relational operators – Logic operators – Assignment operators – Increment and decrement operators – Conditional operators.

UNIT –II (12 hrs)
    3.Expressions and I/O statements : Arithmetic expressions – precedence of arithmetic operators – Type converters in expressions – Mathematical (Library) functions – Data input and output – The getchar and putchar functions – Scanf – Printf simple programs.
    4.Control statements: IF – ELSE statements – Switch statements – The operators – GO TO- while, DO-While, FOR statements – BREAK and CONTINUE statements.

UNIT – III (12 hrs)
    5.Arrays: One dimensional and two dimensional arrays – Initialization –Type declaration – Inputting and outputting of data for arrays – Programs of matrices addition, subtraction and multiplication.
    6.User defined functions: The form of C functions – Return values and their types – Calling a function – Category of functions. Nesting of functions. Recursion. ANSI C functions – Function declaration. Scope and life of variables in functions.

UNIT – IV (12 hrs)

    7.Linear and Non-Linear equations: Solution of Algebra and transcendental equations – Bisection, Falsi position and Newton – Rhapson methods – Basic principles – Formulae – algorithms.
    8.Simultaneous equations: Solutions of simultaneous linear equations – Guass elimination and Gauss seidel iterative methods – Basic principles – Formulae- Algorithms.

UNIT – V (12 hrs)
    9.Interpolations : Concept of linear interpolation – Finite differences –
    Newton's and Lagrange's interpolation formulae – principles and Algorithms.

10.Numerical differentiation and integration : Numerical differentiation – algorithm for evaluation of first order derivatives using formulae based on Taylor's series – Numerical integration – Trapezodal and Simpson's 1/3 rule – Algorithms.

Cluster Elective Paper – VIII-A-2 : Practical

Computational Methods and Programming

2 hrs/ week   credits – 2

Minimum of 6 experiments to be done and recorded

1. Write a program that reads an alphabet from keyboard and display in the reverse order.

2. Write a program to read and display multiplication of tablets.

3. Write a program for converting centigrade to Fahrenhit temperature and Fahrenheit temperature centigrade.

4. Write a program to find the largest element in an array.

5. Write a program based on percentage calculation , the grade by entering the subject marks . (If percentage > 60, I class, if percentage between 50 &60 II class, if percentage between 35 & 50 III class, if percentage below 35 fail)

6.Write a program for generation of even and odd numbers up to 100 using while, do – while and for loop.

7.Write a program to solve the quadratic equation using Bisection method.

8.Write a program for integration of function using Trapezoidal rule.

9.Write a program for solving the differential equation using Simpson's 1/3 rule.

DEPARTMENT OF PHYSICS
III B.Sc. 6th Semester
(W.E.F 2021-22)

COURSE CODE : PHY-604 CE

Cluster Elective Paper – **VIII-A-3**: **Electronic Instrumentation**

No.of Hours per week: 04   Total Lectures: 60

UNIT -1 (12 Hours)

1. Basic of measurements: Instruments accuracy, precision, sensitivity- errors in measurements- Basic meter movement-PMMC (Permanent Magnetic Moving Coil).
2. Measurement of dc current: DC ammeter- multi range ammeters-the ARYTON Shunt or universal Shunt.
3. Measurement of dc voltage: DC Voltmeter – Multi Range Voltmeter- Voltmeter sensitivity.

UNIT – II (10 HOURS)

4. Analog Multimeter: Multimeter - as dc ammeter-as dc voltmeter-as ac voltmeter- as ohm meter-Multimeter operating instructions.

5. Digital instruments: Principle and working of digital instruments, characteristics of a digital meter, working principle of digital voltmeter.

UNIT –III (14 HOURS)

6. CRO: Block diagram of basic CRO, construction of CRT, electron gun, electrostatic focusing and acceleration (only explanation), time base operation, synchronization, front panel controls, specifications of CRO and their significance.
7. Applications CRO: Measurement of voltage- dc and ac, frequency, time period. Special features of dual trace CRO. Digital storage oscilloscope: block diagram and principle of working.

UNIT – IV (12 HOURS)

8. Diode as Rectifier – Half wave rectifier, Full wave rectifier – construction, working and efficiency. (no derivation)
9. Feedback in Electronic circuits – Positive and Negative feedback, expressions for gains, advantages of negative feedback, Oscillators, Barkhausen criteria, RC phase shift oscillator (no derivation)

UNIT – V (12 HOURS).

10. Signal Generators: Block diagram, working and specifications of low frequency signal generators, pulse generator, function generator .
11. Bridges: Measurement of resistance by Wheat stone's Bridge- Sensitivity of Wheat stone's Bridge- Applications of Wheat stone's Bridge-Limitations of Wheat stone's Bridge.

Cluster Elective Paper – VIII-A-3-Practical :
      Electronic Instrumentation   *2hrs/Week.*

Minimum of 6 experiments to be done and recorded*.*

1. Study the loading effect of a multimeter by measuring voltage across a low and high resistance.
2. Study the limitations of a multimeter for measuring high frequency voltage and currents.
3. Measurement of voltage , frequency, time period and phase angle using CRO.
4. Measurement of time period and frequency using universal counter/ frequency counter.
5. Measurement of rise, fall and delay times using a CRO.
6. Measurement of distortion of a RF signal generator using distortion factor meter.
7. Measurement of R with Wheat stone bridge

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DEPARTMENT OF POLITICAL SCIENCE

HIGHLIGHTED SYLLABUS OF POLITICAL SCIENCE
2021-2022

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. 1st Semester
(2021-2022)

Paper I: Introduction to Political Science   Semester-I   Paper
code:POLT11A

 Work load: 90 hrs per semester   credits - 4   5 hrs/week

 UNIT- I (20 hours)
  Introduction
 1)Definition,Nature,Scope and Importance of Political Science-Relations
  with Allied Disciplines (History,Economics,Philosophy and Sociology)
 2)Approaches to the Study of Political Science:
  Traditional Approaches:Historical,Normative and EmpiricalApproaches
  Modern Approaches: Behavioral and System Approach

  UNIT- II (15 hours)
  State

  Definition of the State,Elemenst of the Stae,Theories of Origin of the State- Devine
  Origin Theory,Social contract Theories,Historical Evolutionary Theory
  1)Concepts of Modren State and Welfare State

  UNIT- III (20 hours)
   Concepts of Political Science
  1.Law-Liberty
  2Power,.Authority and Legitimacy

  UNIT –IV (15 hours)
  Theories of Rights
  1)Meaning,Nature and Classification of Rights

  UNIT- V
  Political Ideologies
  1)Liberalism,Individualism and Anarchism
  2)Socialsm,Marxism and Multicultuarlism

DEPARTMENT OF POLITICAL SCIENCE
I B.A 2nd Semester
(2021-2022)

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

DEPARTMENT OF POLITICAL SCIENCE
II B.A – III Semester

(2021-2022)

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.

DEPARTMENT OF POLITICAL SCIENCE
II B.A – IV Semester

(2021 – 2022)

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

DEPARTMENT OF POLITICAL SCIENCE
COURSE CODE : POL-402   II B.A 4th Semester

(2021-2022)

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.

DEPARTMENT OF POLITICAL SCIENCE
III B.A. 5th Semester
(2021-2022)
Paper V: Indian Political Thought

Work load : 90 hrs per semester   **5 hrs/week**
Course Code : POL 501C

Unit – I (15hours)
1.Traditions of Ancient Indian Political Thought
1)Sources and Feautures of Ancient Indian Political Thought
2)Manu-Social Laws
2)Kautilya—Theory of State

Unit – II (15hours)
2. Renaissance Thought
1)Rammohun Roy-Religious and Social Reforms
2)PanditaRamabai-Gender

Unit-III(20hours)
3.Early Nationalism
1)Dadabai Naoroji-Drain Theory and Poverty
2)Ranad,M.G-The Role of the State and Religious Reform

Unit-IV (20hours)
4. Religious Nationalism
1)Savaskar V.D-Hindutva or Hindu Culture Nationalism
2)Mohammed Iqbal-Islamic Communitarian Nationalism

Unit-V(20hours)
5.Democratic Egalitarianism
1)Gandhi-Swaraj and Satyagraha
2)Jawahalal Nehru-Democratic Socialism
3)D.R B.R Ambedkar-Annhhilation of Caste System
4)M.N Roy-Radical Humanism

DEPARTMENT OF POLITICAL SCIENCE
III B.A– V Semester
(2021 –2022)
Paper-V-Western Political Thought

 Course Code : POL 502C   **Work Load : 90 hrs per sem**

5 hrs/week

Unit – I (20 hours)

1.Classical Western Political Thought
1)Plato-Theories of Forms,Critique of Democracy,Justice
2)Aristotle-Citizenship,Satte,Justice,Virtue

UNIT – II (15 hours)
2. Early Medieval to the Beginning of Modern Thought
1)Saint Augustine-Earthly City and Heavenly City,Evil,Free Will,Moral Action
2)Machiavelli-Statecraft,Virtue,Fortuna

UNIT – III (20 hours)
3.Liberal Thought
1)Thomas Hobbs-Human Nature,Social Contract,Liberty,State
2)Jhon Lock-Natural Rights,Consent,Social Contract,State
3)Rousseau-Social Instituions and Moral Man Equality,liberty and General will

UNIT – IV (20 **hrs**)
4. Liberal Democratic Thought
1)Jeremy Bendham-Utilitarianism
2)J.S Mill-Individual Liberty,Representative Government

UNIT – V (15 hours)
5.Philosophical Idealism and it's Critue
1)Hegel-Individual Freedom,Civil Society,State
2)Karl Marx-Alienation,Surplus Value,Materialistic Conception of History,State

DEPARTMENT OF POLITICAL SCIENCE
III B.A– VI Semester – Paper –VI
(2021 – 2022)

General Elective   **Course Code: POL – 601GE**

SEMISTER-VI   **5 hrs/week**

GENERAL ELECTIVE PAPER –LOCAL SELF –GOVERNMENT   IN ANDHRA PRADESH

UNIT- I (20 hours)   **Total Lectures: 90 hours**
1.Evolution of Local Self Government in India
1)Constitution of Provisions on Local Self Government
2)Recommendations of Balwanth Roy Mehta and Ashok Mehta Committees on Local Self Government

UNIT- II (15hours)
2.Importance of Constitutional Amendments
1)73rd Amendment-Rural Local Bodies;Basic feautures
2)74th Amendment-Urban Local Bodies;Basic Feautures

UNIT-III
3.Structure and Functions of Panchayat Raj in Andhra Pradesh
1)Gram Panchayati
2)Mandal Parishad
3)Zilla Parishad

UNIT- IV (20hours)
4. Structure and Functions of Urban Local Bodies in Andhra Pradesh
1)Nagarapanchayats
2)Municipalities
3)Municipal Corporations

UNIT- V (15hours)
1.Role of the Leadership and Emerging Challenges
1)Emerging Pattrens of Leadership
2)Problems of Autonomy:Financial and Administrative Spheres

DEPARTMENT OF POLITICAL SCIENCE
III B.A – VI Semester
(2021–2022)

**SEMISTER-VI   Course Code: POL -602CE   Total Lectures:90 hrs
5 hrs/week**

CLUSTER ELECTIVES
INTERNATIONAL RELATIONS
PAPER UNIT- I (15 hours)

UNIT-I (15 hours)
1.Basic Concepts of International Relations
1)Meaning,Nature and Scope of International Relations
2) (a).Balance of Power (b).National Interest (c).Collective Security (d).Diplomacy

UNIT-II: (20hours)
2.Approaches to the Study of International Relations
1)Idealism-Woodrow Wilson
2)Classical Realism-Hans Morgenthau
3)Neo-Realism-Kenneth Waltz
UNIT-III (20hours)
3.Phases of International Relations (1914-1945)
1)Causes for the first World War
2)Causes for he Second World War

UNIT-IV: (20hours)
 4.Phases of International Relations (1945 Onwards)
1)Origins of First Cold War
2)Rise and Fall of Detente
3)Origins and the End of Second Cold War

UNIT-V: (15hours)
5.International Organizations
1)The Role of U.N.O in the Protection of International Peace
2)Problems of the 3rd World:Struggle for New International Economic Order

DEPARTMENT OF POLITICAL SCIENCE
III B.A 6th Semester
(2021-2022)

(COURSE CODE : POL-603 CE   **Paper VIII**

(Cluster)

Cluster Elective Paper – <u>VIII- C-2</u> : <u>Indian Foreign Policy</u>

No. of Hours per week : 05   **Total Lectures : 90**

UNIT – I (25 hours)
 1.Evolution of Indian Foreign Policy
 1)Determinants of Indian Foreign of Policy
 2)Continuity and Change in Indian Foreign Policy

UNIT –II (20 hours)
 2. Non Alignment and U.N.O
1)The Role of India in Non-Alignment Movement
2)Relevance of Non-Alignment Movement in the Contemporary World

UNIT – III (25 hours)
1. India's Relations With USA and China
1)Indo-U.S Relations:Pre-Cold War Era,Post-Cold War Era
2)India-China Relations:Pre-Cold War Era,Post-Cold War Era

UNIT – IV (20 hours)
1. India and It's Neighbours
1)Indo-Pakistan Relations
2)India's Rule in South Asian Association of Regions Cooperations (SAARC)

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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   ▢ (yellow)

Skill-Development   ▢ (sky blue)

Entrepreneurship   ▢ (green)

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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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DEPARTMENT OF TELUGU

HIGHLIGHTED SYLLABUS OF TELUGU

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

| TELUGU | TELTIIA | 2021-2022 | IB.A.,B.COM.,B.SC |

I SEMESTER – SYLLABUS
TELUGU - I

యూనిట్ - I

రాజనీతి   - నన్నయ

మహా భారతం - సభాపర్వం - ప్రథమాశ్వాసంలో 26వ పద్యము "మీవంశమున - నీవు వారిద్దైన చెర్పెటింగి" నుండి 57వ పద్యము "నాయధాశక్తి .....వాని ననుష్థితు ప్రియముతోడ" వరకు.

యూనిట్ - II

దక్షయజ్ఞం   - నన్నెచోడుడు

కుమార సంభవం - ద్వితీయాశ్వాసంలో 49వ వచనం "అంతకమున్ను......భయంకరా కారంటుదాల్చిన" నుండి 86వ పద్యం "ప్రమధగణము.....కనిరిశంభు" వరకు.

యూనిట్ - III

ధౌమ్యధర్మోపదేశము   - తిక్కన

మహాభారతము - విరాటపర్వము - ప్రథమాశ్వాసంలో 116వ పద్యం "ఎగిగెడు వారికిసైనను.... వలయు దగియెడు బుద్దుల్" నుండి 146వ పద్యం "అతడు నియతితోడ....సంచయములు దగ జపించుచుండె" వరకు

యూనిట్ - IV

మధుర స్నేహం   - పోతన

ఆంధ్రమహాభాగవతము - దశమస్కంధము - కుచేలోపాఖ్యానంలో 962వ పద్యం "లలిత పతిప్రతా తిలకంబు.....కుపాయమూహింప వైతి" నుండి 983వ పద్యం "తన మృదుతల్పమందు....ధరణీసురు డెంతటి భాగ్యవంతుడో" వరకు.

యూనిట్ - V

సీతారావణ సంవాదం   - మొల్ల

రామాయణము - సుందరకాండములో 40వ వచనం "ఆరామంజచి....వృక్షం బారోహించి యందు" నుండి 87వ పద్యం "కావున నిక్కమలియెడ....మనకు దిక్కగు మీదన్" వరకు.

వ్యాకరణము :-

1. సంధులు :- సవర్ణ, గుణ, యణాదేశ,వృద్ధి, అకార,ఇకార,ఉకార,త్రికసంధులు

2. సమాసములు :- తత్పురుష, కర్మ్మధారయ, ద్వంద్వ, ద్విగు, బహుప్రీహి సమాసములు.

3. ఛందస్సు :- వృత్త పద్యాలలో ఉత్పలమాల,చంపకమాల,శార్దూలము, మత్తేభము.

జాతులు, ఉపజాతుల్లో కందము, తేటగీతి, ఆటవెలది మరియు ముత్యాలసరాలు.

4. అలంకారములు :- శబ్దాలంకారాల్లో అనుప్రాసలైన వృత్త్యనుప్రాస, ఛేకానుప్రాస,లాటానుప్రాస, అంత్యానుప్రాసములు.

అర్ధాలంకారాల్లో ఉపమ,ఉత్రేక్ష,రూపక శ్లేషలు.

ఆధార గ్రంధాలు:

1. శ్రీ మదాంధ్ర మహాభారతము - సభా పర్వము - తిరుమల తిరుపతి దేవస్థానం ప్రచురణ.

2. శ్రీ మదాంధ్ర మహాభారతము - విరాట పర్వము - తిరుమల తిరుపతి దేవస్థానం ప్రచురణ.

3. కుమార సంభవం - నన్నె చోడుడు.

4. శ్రీ మహాభాగవతము – పోతన

5. రామాయణము – మొల్ల.

TELUGU

Accredited at 'A' NACC

TEL – 301   2021-2022

IB.A.,B.COM.,B.SC

III SEMESTER – SYLLABUS
TELUGU – I
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 (అచ్చ 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

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.ఎస్సీ.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. నూరేళ్ల తెలుగు నాటక రంగం - ప్రొ.మొదలి నాగభూషణ శర్మ
8. నాటక శిల్పం - ప్రొ.మొదలి నాగభూషణ శర్మ

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" GradeISO 9001:2015 Certified Institution

DEPARTMENT OF ZOOLOGY

2021-2022

MINUTES OF BOARD OF STUDIES

ODD SEMESTER
01-11-2021

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

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Title of the Paper:**Animal Diversity Biology of Non – Chordates**

Semester: - I

Course Code	*ZOOT11A*	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 : 2017-18	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 0%

Syllabus
Course Details

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, Genetics, Molecular Biology & Evolution**		
Course Code: *ZOO-301*		
Semester: - III		
Syllabus		

Unit	Learning Units	Lecture Hours
I	Unit–I Cell Biology Definition,history, prokaryotic andeukaryoticcells,virus,viroids, mycoplasma Electron microscopicstructureofanimalcell. Plasmamembrane–Modelsandtransportfunctions ofplasma membrane. StructureandfunctionsofGolgicomplex,EndoplasmicReticulumand Lysosomes Structure and functionsofRibosomes,Mitochondria, Nucleus, Chromosomes (Note:1.Generalpatternofstudyofeachcellorganelle– Discovery,Occurrence,Number,Origin Structure andFunctionswithsuitable diagrams) 2.Neednotstudycellularrespirationundermitochondrialfunctions)	**10**
II	Unit–II Genetics –I Mendel'sworkontransmissionoftraitsGeneInteraction–IncompleteDominance,Codominance, LethalGenes Polygenes(GeneralCharacteristics&examples);MultipleAlleles(GeneralCharacteristicsandBlood group inheritance Sexdetermination(Chromosomal,GenicBalance,Hormonal,EnvironmentalandHaplo-diploidytypesof sexdetermination) Sex linked inheritance(X-linked-linked &XY-linked inheritance)	**13**
III	Unit–III Genetics –II Mutations&Mutagenesis ChromosomalDisorders(Autosomal andAllosomal) HumanGenetics– Karyotyping,PedigreeAnalysis(basics) BasicsonGenomicsand Proteomics	**10**
IV	UNITIV: MolecularBiology Central Dogma of Molecular Biology Basicconceptsof– a. DNAreplication–Overview(Semi-conservativemechanism,Semi-discontinuousmode, Origin&Propagation ofreplication fork) b. Transcriptioninprokaryotes–Initiation,ElongationandTermination,Post-transcriptionalmodifications (basics) c. Translation– Initiation,ElongationandTermination Gene Expression in prokaryotes(LacOperon);Gene Expression in eukaryotes	**15**
V	Unit–V Originoflife TheoriesofEvolution:Lamarckism,Darwinism,GermPlasm Theory,MutationTheory. Neo-Darwinism: Modern SyntheticTheoryofEvolution,Hardy-WeinbergEquilibrium. ForcesofEvolution: Isolatingmechanisms,GeneticDrift,NaturalSelection,and Speciation.	**12**

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Title of the Paper: Animal Biotechnology

Semester: - V

Course Code	**ZOO-501**	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 : 2017-18	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 0%

Syllabus
Course Details

Unit	Learning Units	Lecture Hours
I	**Unit 1: Tools of Recombinant DNA technology - Enzymes and Vectors** Restriction modification systems : Types I, II and III- Nomenclature, Applications of Type II restriction enzymes in genetic engineering ,DNA polymerases, transferase, kinases and phosphatases,and DNA ligases Cloning Vectors: : Properties of Cloning Vectors Plasmid vectors:pBR and pUC 18, Bacteriophage and, Cosmids.Artificial Chromosome Vectors: BACs, YACs	**15**
II	**Unit 2: Techniques of Recombinant DNA technology** Cloning: Procedure of gene cloning, Use of linkers and adaptors. Microinjection, electroporation, biolistic method (gene gun).PCR:- Basics of PCR, Principle and Procedure of PCR. DNA Sequencing: Sanger's method of DNA sequencing-traditional and automated sequencing. Southern, Northern and Western blotting. DNA finger printing,	**15**
III	**UNIT 3 Animal Cell Technology** Cell culture media: Natural and Synthetic, Types Cell cultures-: primary culture, secondary culture. Continuous cell lines , Established Cell lines (common examples such as MRC, HeLa,CHO, BHK,) Cryopreservation of cultures, Hybridoma Technology:- Cell fusion, Production of Monoclonal antibodies (mAb), Applications of mAb Stem cells: Types of stem cells- Embryonic and Adult Stem Cells, Diabetes and Parkinson's diseases.	**10**

IV	**Unit 4: Reproductive Technologies & Transgenic Animals** Manipulation of reproduction in animals, Artificial Insemination, *In vitro* fertilization. Super ovulation, Embryo transfer, Embryo cloning. Transgenic Animals- Production of Transgenic Animals- sheep, fish.	**10**
V	**Unit 5: Applied Biotechnology** Industry: Fermentation- Different types of Fermentation. Submerged & Solid state, batch, Fed batch & Continuous (Short notes only) Downstream processing - Filtration, centrifugation, chromatography, spray drying , Fisheries: Polyploidy in fishes.	**10**

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Title of the Paper: Animal Husbandry

Semester: - V

Course Code	*ZOO-502*	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 : 2017-18	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 0%

Unit	Learning Units	Lecture Hours
I	**UNIT – I:** General introduction to poultry farming, Principles of poultry housing. Poultryhouses. Systems of poultry farming. Management of chicks, growers, layers, and Broilers.	10
II	**UNIT – II:** Poultry feed management – Principles of feeding. Nutrient requirements fordifferent stages of layers and broilers. Methods of feeding- Whole grain feeding system, Grain and mash method, All mash method, Pellet feeding. Poultry diseases – viral, bacterial, fungal and parasitic (two each); symptoms, control and management.	**10**
III	**UNIT – III:** Selection, care and handling of hatching eggs, Egg testing. Methods of hatching. Brooding and rearing, Sexing of chicks.	**10**
IV	**UNIT- IV:** Breeds of Dairy Cattle and Buffaloes – Definition of breed; Classification of Indian Cattle breeds, exotic breeds and Indian buffalo breeds. Systems of inbreeding and crossbreeding. Housing of dairy animals – Selection of site for dairy farm; systems of housing – loose, housing system. Conventional dairy barn.	**20**
V	**UNIT - V:** Care and management of dairy animals - Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks. Cleaning and sanitation of programme. Records to be maintained in a dairy farm.	**10**

Title of the Paper:**Poultry Farming**
Semester: - III

Course Code	**PF-301**	Course Delivery Method	Class Room/Blended Mode - Both
Credits	2	CIA Marks	00
No. of Lecture Hours/ Week	10	Semester End Exam Marks	50
Total Number of Lecture Hours	30	Total Marks	50
Year of Introduction :	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 0%

SKILL DEVELOPMENT COURSE	Course code: PF-301	*2021-2022*	**A.B.C.,&B.Sc**

Learning Outcomes:

By successful completion of the course, students will be able to;

1. Understand the field level structure and functioning of insurance sector and its role in protecting the risks
2. Comprehend pertaining skills and their application for promoting insurance coverage
3. Prepare better for the Insurance Agent examination conducted by IRDA
4. Plan 'promoting insurance coverage practice' as one of the career options.

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

2021-2022

MINUTES OF BOARD OF STUDIES

EVEN SEMESTER

01-04-2022

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

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Title of the Paper: Animal Diversity Biology of Chordates.
Semester: - II

Course Code	ZOO T21A	Course Delivery Method	Class Room/Blended Mode - Both
Credits	4	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 : 2021-22	Year of Offering 2020-2021	Year of Revision – 2021-22	Percentage of Revision: 70%

Course Description:

This course will provide one with a basic and comprehensive understanding of *Pro chordates* and pisces origin, type study, respiratory, circulatory and nervous system etc., Enable the student with depth of topics and helps then to gain appreciation of Amphibia and Reptilia type studies, Aves and mammals type studies. On the other hand, importance of understanding parental care in amphibians, south indian chelonians, birds as glorified reptiles and significance of birds migration and flight adaptations in birds are learnt. A part from these the students will be enhanced with the knowledge of aquatic mammals and dentition in mammals.

Course Objectives:
 To understand the structural organization of animals of prochordates and cyclostomes.
To understand the type study belonging to Pisces.
 To understand type study belonging to amphibian.
 To understand the type study belonging to reptilia and identification of piousness snakes.
 To understand the type study belonging to Aves and Aquatic mammals.

Course Outcomes:

CO1	Gain knowledge in the major Chordate groups, describe their salient features, appreciate the diversity and analyze the uniqueness of different groups.
CO 2	Understand the fundamental organization of chordates and evaluate the similarities and differences among the different groups of chordates in the light o evolutionary significance.
CO 3	Comprehend and compare the morphology and anatomy of different classes of chordates and apply the same to their fitness in the ecological habitats
CO 4	Develop the skill of identifying the vertebrate fauna in general and South Indian fauna in specific.
CO 5	Acquaint with the significance of unique mechanisms and behavioral patterns exhibited by different groups of chordates.

Syllabus

Unit	Learning Units	Lecture Hours
I	UNIT I Protochordates to cyclostomes Protochordates Salient features of UrochordataandCephalochordata 1 hour Structure and life-history of *Herdmania*,2 hours Significance of retrogressive metamorphosis. 2 hours General organization of vertebrates1 hour General characters of cyclostomes 1 hour Comparison of *Petromyzon*and*Myxine*1 hour	8 hrs
II	UNIT II Fishes Type study – *Scoliodon* - Morphology, respiratory, circulatory, excretory and nervous systems and sense organs. 8hrs Migration in fishes. 1hour Viviparity in fishes 1 hour Types of scales 1 hour Accessory respiratory organs in fishes 2 hours	13 HOURS
III	UNIT III Amphibia South Indian Amphibians. 1 hour Type study - *Rana*: Morphology, digestive system, respiratory system circulatory system,excretory system, nervous system and reproductive system 9 hours Parental care in amphibians1 hour	11 HOURS
IV	UNIT IV Reptilia South Indian Chelonians. 2 hours Type study – *Calotes*: Morphology, digestive, respiratory, circulatory, urinogenital and nervous systems. 8hrs Identification of poisonous snakes 1hour	11 HOURS
V	UNIT V Aves and Mammalia Aves Birds as Glorified Reptiles. 2hours Type study-Pigeon (*Columbialivia*): Exoskeleton, respiratory, circulatory and excretory systems7 hours Significance of migration in birds 2 hours Flight adaptations in birds 2 hours Mammalia Aquatic Mammals 2 hours Dentition in Mammals. 2 hours	17 HOURS

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Title of the Paper: ANIMAL PHYSIOLOGY, CELLULAR METABOLISM ANDEMBRYOLOGY

Semester: - IV

Course Code	*ZOO-401*	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 : 2019-20	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 100%

CourseOutcomes:
This course will provide students with a deep knowledge in Physiology, Cellularmetabolism and Molecular Biology and by the completion of the course the graduate shallable to–
CO1:Understandthefunctionsofimportantanimalphysiologicalsystemsincludingdigestion,cardio-respiratoryand renal systems.
CO2:Understandthemuscularsystemandtheneuro-endocrineregulationofanimalgrowth,development andmetabolismwithaspecialknowledgeofhormonalcontrolofhumanreproduction.
CO3:Describe the structure,classification and chemistry of biomolecules andenzymesresponsiblefor sustenanceoflifeinlivingorganisms
CO4:Developbroadunderstandingthebasicmetabolicactivitiespertainingtothecatabolismand anabolismof various biomolecules
CO5 :Describe the key events in early embryonic development starting from the formationofgametesupto gastrulationand formation ofprimarygerm layers.

- LearningObjectives
- Toachieveathoroughunderstandingofvariousaspectsofphysiologicalsystemsand theirfunctioninginanimals.
- Toinstiltheconceptofhormonalregulationofphysiology,metabolismandreproductionin animals.
- Tounderstand the disordersassociated with thedeficiencyofhormones
- TodemonstrateathoroughknowledgeoftheintersectionbetweenthedisciplinesofBiologyand Chemistry.
- Toprovideinsightfulknowledgeonthestructureandclassificationofcarbohydrates,proteins,lipids and enzymes
- To demonstrate an understanding of fundamental biochemical principles suchas the function of biomolecules, metabolic pathways and the regulation ofbiochemicalprocesses
- To make students gain proficiency in laboratory techniques in biochemistryandorientthemtoapplythescientificmethodtotheprocessesofexperimentationand hypothesis testing.

Unit	Learning Units	Lecture Hours
I	AnimalPhysiology -I Processofdigestionandassimilation Respiration - Pulmonary ventilation, transport of oxygen and CO2(Note:Need not studycellularrespiration here) Circulation-Structureandfunctioningofheart,Cardiaccycle Excretion - Structure and functions of kidney urine formation, counter currentMechanism	10
II	Animal Physiology –II Nerveimpulsetransmission-Restingmembranepotential,originandpropagationofactionpotentialsalongmyelinatedandnon-myelinatednervefibers Muscle contraction - Ultra structure of muscle, molecular and chemical basis ofmusclecontraction Endocrine glands - Structure, functions of hormones of pituitary, thyroid,parathyroid,adrenalglands and pancreas Hormonalcontrolof reproductionina mammal	15
III	CellularMetabolism–I (Biomolecules) Carbohydrates-Classificationofcarbohydrates.Structureofglucose Proteins-Classificationofproteins.Generalpropertiesofaminoacids Lipids-Classificationoflipids Enzymes:ClassificationandMechanismofAction	15
IV	CellularMetabolism–II Carbohydrate Metabolism - Glycol sis, Krebs cycle, Electron Transport Chain,Glycogenmetabolism,Gluconeogenesis LipidMetabolism–β-oxidationofpalmiticacid Proteinmetabolism–Transamination,DeaminationandUreaCycle	10
V	Embryology: Gametogenesis Fertilization Typesofeggs Typesofcleavages Developmentof Frogup toformationofprimarygerm layers	10

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Title of the Paper: IMMUNOLOGYANDANIMALBIOTECHNOLOGY

Semester: - IV

Course Code	ZOO-402	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 : 2019-20	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision:100%

CourseOutcomes:

Thiscoursewillprovidestudentswithadeepknowledgeinimmunology,genetics,embryologyand ecologyandbythecompletionofthecoursethegraduateshall able to–

CO1:TogetknowledgeoftheorgansofImmunesystem,typesofimmunity,cellsandorgansof immunity.

CO2:Todescribeimmunologicalresponseastohowitistriggered(antigens)andregulated (antibodies)

CO3:UnderstandtheapplicationsofBiotechnologyinthefieldsofindustryandagricultureincluding animalcell/tissueculture, stemcelltechnologyandgeneticengineering.

CO4:Getfamiliarwiththetoolsandtechniquesofanimalbiotechnology.

- LearningObjectives
- Totracethehistoryanddevelopment of immunology
- Toprovidestudentswithafoundationinimmunological processes
- Tobeabletocompareandcontrasttheinnateversusadaptiveimmunesystemsandhumoral versuscell-mediated immuneresponses
- UnderstandthesignificanceoftheMajorHistocompatibilityComplexintermsofimmuneresponse and transplantation
- Toprovideknowledgeonanimalcellandtissuecultureandtheirpreservation
- Toempowerstudentswithlatestbiotechnologytechniqueslikestemcelltechnology, genetic engineering, hyridoma technology, transgenic technology andtheirapplication in medicineandindustryforthebenefit of livingorganisms
- Toexplain*invitro*fertilization,embryotransfertechnologyandotherreproductionmanipulation methodologies.
- To get insight in applications or recombinant DNA technology in agriculture,productionoftherapeuticproteins.
- Tounderstandprinciplesofanimalculture,mediapreparatio

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	Immunology –I (Overview of Immune system) Introduction to basic concepts in Immunology Innate and adaptive immunity, Vaccines and Immunization program Cells of immune system Organs of immune system	10
II	Immunology –II (Antigens, Antibodies, MHC and Hypersensitivity) Antigens: Basic properties of antigens, B and T cell epitopes, haptens and adjuvants; Factors influencing immunogenicity Antibodies: 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	15
III	Techniques Animal Cell, Tissue and Organ culture media: Natural and Synthetic media, Cell cultures: Establishment of cell culture (primary culture, secondary culture, types of cell lines; Protocols for Primary Cell Culture); 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)	15
IV	Genetic Engineering: Basic concept, Vectors, Restriction End nucleases and Recombinant DNA technology Gene delivery: Microinjection, electroporation, biolistic method (gene gun), liposome and viral-mediated gene delivery Transgenic Animals: Strategies of Gene transfer; Transgenic - sheep, - fish; applications Manipulation of reproduction in animals: Artificial Insemination, *In vitro* Fertilization, superovulation, Embryo transfer, Embryo cloning	10
V	PCR: Basics of PCR. DNA Sequencing: Sanger's method of DNA sequencing- traditional and automated sequencing (2 hrs) Hybridization techniques: Southern, Northern and Western blotting DNA fingerprinting: Procedure and applications Applications in Industry and Agriculture: Fermentation: Different types of Fermentation and Downstream processing; Agriculture: Monoculture in fishes, polyploidy in fishes	10

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Title of the Paper:**Immunology**

Semester: - VI

Course Code	**ZOO-601C**	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 : 2019	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 0%

Unit	Learning Units	Lecture Hours
I	UNIT- I: **Overview of Immune system** Introduction to basic concepts in Immunology. Innate and adaptive immunity ***Cells and organs of Immune system** Cells of immune system Organs of immune system	10
II	UNIT-II:**Antigens** Basic properties of antigens B and T cell epitopes, haptens and adjuvants Factors influencing immunogenicity	**10**
III	UNIT-III: **Antibodies** Structure of an antibody Classes and functions of antibodies Antigen and antibody interactions. Monoclonal antibodies and their production.	**15**
IV	UNIT-IV: **Working of an Immune system** Structure and functions of major histocompatibility complexes Exogenous and Endogenous pathways of antigen presentation and processing Basic properties and functions of mediator molecules.	**15**

	(cytokines, interferonsand complement proteins). <mark>Mechanisms of humoral and cell mediated immunities</mark>		
V	UNIT-V: **Immune system in health and disease** <mark>Classification and brief description of various types of hyper sensitivities</mark> Introduction to concepts of autoimmunity and immunodeficiency ***Vaccines** General introduction to vaccines <mark>Types of vaccines</mark>	**10**	

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DEPARTMENT OF ZOOLOGY
B.Sc. AQUACULTURE

HIGHLIGHTED SYLLABUS OF B.Sc. AQUACULTURE
2021-2022

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:AQTT11A

Syllabus Course Details

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, reservoirsetc. 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 courseponds 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 fishfarm** Construction of an ideal fish pond – space allocation, structure and	**10**

	components of barrage Pond	
IV	**UNIT-IV (Aquaculture Systems and Practices)** Types of aquaculture Fresh water aquaculture Brackish water aquaculture Mariculture Aquaculture Systems – Pond, Raceways, Cage, Pen, Rafts, Running water, Water Recirculating Systems, Biofloc Technology and 3-C System Pond culture practices- Traditional, Extensive, Modified Extensive, Semi-Intensive, Intensive & Super-intensive systems of fish and shrimp and their significance. Fin fish culture methods - Monoculture, Polyculture and Monosexcultureand Integrated fish farming.	**12**
V	**UNIT-IV (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 oxygenand 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:AQU301C
Syllabus Course Details

Unit	Learning Units	Lecture Hours
I	UNIT- I: Introduction Status, scope and prospects of freshwater aquaculture in the world, India and AP Status, scope and prospects of brackish water aquaculture in the world, India and AP Freshwater and brackish water resources in India. Special culture systems - brief study of culture in running water, re-circulatory systems, cages and pens, sewage-fed fish culture.	10
II	UNIT-II: Culture of carp, air-breathing, and exotic fishes Bundh breeding and Induced breeding of Indian major carp by hypophysationtechnique .Syntheticharmones used for induced breeding of carps. Types of fish hatcheries- traditional, Chinese and jar hatcheries. Preparation and Management of Indian major carp culture ponds – nursery, rearing and grow-out ponds. Culture of air-breathing fishes in India; Pangasius fish farmin Exotic fishes introduced to India and their impact on indigenous species. Composite fish culture of Indian and exotic carps – compatibility and competition.	**10**

III	UNIT-III: Culture of prawn and ornamental fishes Breeding and hatchery management of freshwater prawn, Macrobrachiumrosenbergii. Culture of Macrobrachiumrosenbergii and M. malcolmsonii – biology, seed production, pond preparation, stocking, management, feeding, morph types and harvesting. Ornamental fish culture– Common freshwater and marine ornamental fishes; Fabrication, setting up and maintenance of freshwater and marine aquarium. Breeding and rearing of freshwater ornamental fishes.	**15**
IV	UNIT-IV: Culture of shrimp and crab Breeding and Hatchery management of a typical penaeid shrimp (Penaeus monodon or Litopenaeus vannamei) Transportation of shrimp seed and nursery management. Culture of P. mondon or L. vannamei –pond preparation, stocking, management of water, feedand diseases, and harvesting. Culture of mud crab, Scylla serrata.	**15**
V	UNIT-V: Culture of brackish water fishes Breeding and Culture of milk fish, Chanoschanos. Breeding and Culture of Asian sea bass, Latescalcarifer. Breeding and Culture of grey mullet, Mugil cephalus. Fish and shellfish culture in cages and pens.	**10**

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Title of the Paper:**Fish health management**
COURSE CODE:AQU402C
Semester: - V

Syllabus Course Details

Unit	Learning Units	Lecture Hours
I	**UNIT I: Pathology and parasitology** Introduction to fish diseases –Definition and categories of diseases – Disease and environment Disturbance in cell structure – changes in cell metabolism, progressive and retrogressive tissue changes, types of degeneration, infiltration, necrosis, cell death and causes Atrophy, hypertrophy, neoplasms, inflammation, healing and repair	10
II	**UNIT II: Diseases of fin fish.** Fungal diseases (both of shell and finfish) – Saprolegniosis, brachiomycosis,ichthyophorus diseases – Lagenidium diseases – Fusarium disease, prevention and therapy Viral diseases – Emerging viral diseases in fish, haemorrhagicscepticemia, spring viremia of carps, infectious hematopoietic necrosis in trout, infectious pancreatic necrosis in salmonids, swim-bladder inflammation in cyprinids, channel cat fish viral disease, preventionand therapy Bacterial diseases – Emerging bacterial diseases, aermonas, pseudomonas and vibrio infections, columnaris, furunculosis, epizootic ulcerative syndrome, infectious abdominaldropsy, bacterial gill disease, enteric red mouth, bacterial kidney disease, proliferative kidneydisease, prevention and therapy	**15**
III	**UNIT III: Diseases of shell fish** Major shrimp viral diseases – Bacculoviruspenaeii, Monodon Bacculovirus,Bacculoviral midgut necrosis, Infectious hypodermal and haematopoietic necrosis virus,Hepatopancreatic parvo like virus, Yellow	

	head bacculovirus, white spot bacculovirus.	
	Bacterial diseases of shell fish – aeromonas, pseudomonas and vibrio infections,luminous bacterial disease, filamentous bacterial disease. Prevention and therapy	12
	Protozoan diseases- Ichthyophthiriasis, Costiasis, whirling diseases, trypanosomiasis Prevention and therapy	
IV	**UNIT IV: Nutritional diseases** Nutritional pathology – lipid liver degeneration, Vitamin and mineral deficiency diseases. Aflatoxin and din flagellates. Antibiotic and chemotherapeutics. Nutritional cataract. Genetically and environmentally induced diseases	8
V	**UNIT V: 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 transplants. Production of disease-free seeds. Evaluation criteria of healthy seeds. Good Feed management for healthy organisms, Zero water exchange, Probiotics in health management, Issues of bio security.	15

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Title of the Paper:**Extension, Economics & Marketing**
COURSE CODE:AQU-502C
Semester: - V
Syllabus Course Details

Unit	Learning Units	Lecture Hours
I	## UNIT – I Introduction Meaning and scope of economics with reference to fisheries Basic concepts of economics – goods, services, wants and utility, demand and supply, valueprice, market demand and individual demand, elasticity of demand**,** law of diminishing marginal utility Theory of production, production function in fisheries Various factors influencing the fishery product's price.	10
II	**UNIT – I1 Fisheries marketing** Basic marketing functions, consumer behavior and demand, fishery market survey and test marketing a product Fish marketing – prices and price determination of fishes Marketing institutions- primary (producer fishermen, fishermen cooperatives, and fisheries corporations) and secondary (merchant/agent/speculative middlemen) Methods of economic analysis of business organizations Preparation of project and project appraisal	**15**
III	**UNIT-III Fisheries economics** Aquaculture economics- application of economics principles to aquaculture operations Various inputs and production function. Assumptions of production	

	function in aquaculture analysis, least cost combination of inputs, laws of variable proportions 3Cost 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**
IV	**UNIT-IV Fisheries extension** Fisheries extension – scope and objectives, principles and features of fisheries extension education Fisheries extension methods and rural development Adoption and diffusion of innovations	**10**
V	**UNIT-V Transfer of technology** ICAR programs – salient features of ORP, NDS, LLP, IRDP, ITDA, KVK,FFDA, FCS, FTI, TRYSEM Training – meaning, training vs. education and teaching DAATT centers and their role in tot programs, video conferencing, education of farmersthrough print and electronic media.	**15**

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Title of the Paper:**BIOLOGY OF FIN FISH & SHELL FISH.**
COURSE CODE:AQTT21A
Semester: - II

Unit	Learning Units	Lecture Hours
I	**1.0. Introduction** **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	**11**
II	**2.1. 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 selectivityindex **2.2.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 longevity of fishes** Length frequency method, age composition, age-length keys, absolute	**17**

	and specific growth, back calculation of length and gowth, annual survival rate, asymptomatic length, fitting of growthcurve . Length-weight relationship Condition factor/Ponderal index, relative conditionfactor	
III	**3.0. 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**	**9**
IV	4.0. 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 4.. Embryonic and larval development of crabs Environmental factors affecting reproduction and development of cultivable aquatic fin & shell fish	**12**
V	**5.0. Hormones & Growth** Endocrine system infishes Neurosecretorycells,andogenicgland,ovary,Y-organ,chromatophores,Pericardialglands andcuticle. Molting, molting stages, metamorphosis in crustacean shellfish	**11**

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Title of the Paper: *FISH NUTRITION & FEED TECHNOLOGY*

COURSE CODE:AQU401C

Semester: - IV

Syllabus
Course Details

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 feeding rate, check tray, factors affecting energy partitioning and feeding Importance of natural and supplementary feeds, balanced diet**.**	10
II	**Types of feeds and Feed additives** Live foods**:** Fish food organisms – Bacterioplankton, phytoplankton, zooplankton and their role in larval nutrition. 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,	**10**

	growth promoters, feed stimulants; use of preservatives.	
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 offeed, 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 &trayfeeding Feeding schedules: Frequency of feeding, feeding rates and rationsize Feed evaluation:feed conversion ratio, feed conversion efficiency and protein efficiencyratio.	**15**
V	**Nutritional pathology of fish and shrimp** Protein(Essential aminoacid) and Lipid (Essential fattyacid) deficiency disorders; Fatty liver disease infishes Vitamin and mineral deficiencydisorders Anti-nutrients andafflatoxins.	**10**

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Title of the Paper: **FISH HEALTH MANGEMENT**

COURSE CODE:AQU-501C

Semester: - IV
Syllabus Course Details

Unit	Learning Units	Lecture Hours
I	Introduction Principles of disease diagnosis and fish health management. Prophylaxis, Hygiene and Therapy of fish diseases. Defence mechanism in finfish and shellfish – specific and non-specific immunesystem. Role of stress and host defence mechanism in disease development - Host, pathogen and environment interaction.	10
II	Fish Diseases Clinical symptoms, pathology, prevention and therapy of **Viral diseases:** Viral Haemorrhagicscepticemia, Infectious Hematopoietic Necrosis (IHN). **Bacterial diseases:** Epizootic ulcerative syndrome, Infectious abdominal dropsy, Bacterial gill disease, Columnaris disease, Tail and finrot. **Fungal diseases:** Saprolegniasis and Brachiomycosis. **Protozoandiseases:**Ichthyophthiriasis,Myxoboliasis/ Whirlingdisease,Enterococcidiasis. **Helminthic and Crustacean parasitic diseases:** Gyrodactylosis and Dactylogyrosis; Argulosis and Lernaeasis.	**10**

III	Shrimp Diseases Clinical symptoms, pathology, prevention and therapy of **Viral diseases**: White spot syndrome, Monodon Bacculovirus, Infectious hypodermal and haematopoieticnecrosis virus, Hepato Pancreatic parvo like virus, Yellow head bacculovirus, TauraSyndrome. **Bacterial diseases:** Vibriosis, white gut disease, loose shell syndrome, Acute Hepato- pancreatic Necrosis Disease (Early Mortality Syndrome,EMS) **Fungal diseases:** Hepatopancreatic microsporidiosis (HPM) by .Enterocytozoonhepatopenaei (EHP),*Lagenidium*and *Fusarium*disease. **Protozoan diseases:** ectocommensal protozoa –*Zoothamnium*and*Acineta.*	**15**
IV	Nutritional and Environmental disorders Clinical symptoms, pathology, prevention and therapy of **Fish:**Protein (Essential amino acid) and Lipid (Essential fatty acid) deficiency disorders; Vitamin and mineral deficiency disorders; Fatty liver disease; Gas bubble disease, Asphyxiation. **Shrimp:** Soft shell syndrome, Blue disease/Pigment deficiency syndrome, Red disease, Cramp tail syndrome, Black gill disease, Muscle necrosis, Black deathdisease. Role of gut probiotics in health management of fish and shrimp. Bioremediation of soil and water as a strategy for health management in ponds.	**15**
V	Fish Health Management Diagnostic tools – immune detection- DNA/RNA technique – molecular diagnosis of viral diseases. Principles and methods of vaccine production and fish immunization. Quarantine and health certification in aquaculture. Significance of Biosecurity and Specific pathogen free seed(SPF) in health management.	**10**

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Title of the Paper:**Ornamental fishery**

COURSE CODE:AQU601C

Semester: - VI

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	UNIT- I: **Introduction** Aquarium and ornamental fishes – introduction Present status of Aquarium trade in the world and India Aquarium accessories – aerators, filters, lighters and heaters Water quality needs and different kinds of feeds.	10
II	UNIT-II: **Fresh water ornamental fishes** Live bearers, gold fish, koi, gourami, barbs abd tetras, angel fish and cichlid fish Brood stock development, breeding, larval rearing and grow out. Larval feeds and feeding	**10**
III	UNIT-III: **: Marine ornamental fishes** Varieties and habitat of marine ornamental fishes Major marine ornamental fish resources of India	**15**

	Collection and transportation of live fish, use of anaesthetics	
	Breeding of marine ornamental fish.	
	Other aquarium animals – sea anemones, lobsters, worms, shrimps, octopus and starfish	
IV	UNIT-IV: **Aquarium management** Setting up fresh water, marine and reef aquariums. Water quality management for different types of aquariums. Common diseases of aquarium fish, diagnosis and treatment. Temperature acclimatization and oxygen packing for aquarium fish.	15
V	UNIT-V: **Commercial production of aquarium fish and plants** Commercial production units of ornamental fish- requirements and design. Commercial production of goldfish, live bearers, gouramies, barbs, angels and tetras. Mass production of aquarium plants. Retail marketing and export of ornamental fish.	10

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Title of the Paper:**Fish Processing Technology**
COURSE CODE:AQU602C
Semester: - VI (cl-1)
Syllabus
Course Details

Unit	Learning Units	Lecture Hours
I	UNIT- I: : Introduction: Principles of fish preservation. Importance of hygiene and sanitation in fish handling. Quality of water and ice in fish handling and processing. Preparation of ice. Different types of ice used in the seafood industry and their merits. Preservation by refrigerated seawater and chilled sea water	10
II	UNIT-II:Freezing and Canning: Fundamental principles involved in chilling and freezing of fish and fishery products. Various freezing methods. Freezing of shrimps and fishes. Changes duringthe cold storage of fish and fishery products. Principles involved in canning of fish. Different types of containers. Different stages of canning of Tuna. Retortable pouch processing.	**10**

III	**UNIT-III: Drying, Smoking and Freeze-drying:** Principles of smoking, drying and salting of fish, factors affecting drying. Traditional drying / curing methods. Different types of drying. Drying of fish and prawns. Packing and storage of dried products. Spoilage of dried products. Preventive measures. Standards for dry fish products. Cold smoking. Principles of freeze drying. Accelerated freeze drying and packing of freeze dried products. Modern methods of preservation by irradiation and modified atmospheric storage.	**15**
IV	**UNIT-IV: Packing, Cold Storage and Export of Fishery Products:** Functions of packing. Different types of packing materials and its quality evaluation. Packing requirements for frozen and cured products. Statutory requirements for packing. Labeling requirements. Different types of coldStorages. Insulated and refrigerated vehicles.	**15**
V	**UNIT-V:** Export of fishery products from India - major countries, important products, export documents and procedures. Prospects and constraints in export including tariff and non-tariff barriers, marine insurance, export incentives, registered exporters	**10**

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Title of the Paper: **Fishery Microbiology and Fishery by-products**

Semester: - VI (cl-2)

COURSE CODE:AQU

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	UNIT- I: **Introduction:** History and development of microbiology –Different members of the microbial community – General characteristics of bacteria, fungi, viruses, algae and protozoan's. Ultra structure of prokaryotic cell – structure and function of bacterial cell wall, plasma membrane, capsule, flagella and endospore. Structure of fungi and yeast cell. Ultra structure of virus – classification of viruses, LIfe cycle bacteriophages - lytic and lysogenic cycle.	10
II	UNIT-II: **Aquatic Microbiology:** Microflora of aquatic environment, Different culture techniques. Nutrition and growth of bacteria – different types of media for isolation of bacteria and fungi. Isolation, enumeration, preservation and maintenance of cultures. Routine tests for identification of bacteria – morphological, cultural biochemical	**15**

	and serological. Basics of mycological and virology techniques	
III	UNIT-III: **Fish Microbiology:** Perish ability of seafood – Fish as an excellent medium for growth of microorganisms. Spoilage microflora of fish and shellfish. Intrinsic and extrinsic factors affecting spoilage.	**10**
IV	UNIT-IV: **Fishery By-Products**: Fish meal, fish protein concentrate, shark fin rays, fish maws, isinglass, fish liver oil, fish body oil, fish hydrolysates, chitin, chitosan, glucosamine hydrochloride, squalene, pearl essence, ambergris, gelatin, beche-de-mer, fish silage, fish ensilage and seaweed products like agar, alginic acid and carrageen.	**15**
V	UNIT-V: **Value Added Products.** Value addition in sea food. Different types of value added products from fish and shell fishes – status of value addition in Indian seafood sector.Advantages of value addition. Fish mince and Surimi. Analog and fabricated products.Preparation of coated fishery products. Different types of batter and breading and itsapplications. Preparation of products viz. fish / prawn pickle, fish wafers, prawn chutneypowder, fish soup powder, fish protein hydrolysate, fish stacks, fillets, fish curry, mussel products, marinated products.	**10**

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Title of the Paper:**Quality Control in Processing Plants**
COURSE CODE:AQU604C
Syllabus
Course Details

Unit	Learning Units	Lecture Hours
I	UNIT- I: Quality management, total quality concept and application in fish trade. Quality assessment of fish and fishery products - physical, chemical, organoleptic and microbiological. Quality standards. Quality Assurance. Inspection and quality assurance.	10
II	UNIT-II: Fish inspection in India, process; water quality in fishery industry, product quality, water analysis, treatments, chlorination, ozonisation, UV radiation, reverse osmosis, techniques toremove pesticides and heavy metals.	**10**
III	UNIT-III Sensory evaluation of fish and fish products, basic aspects, different methods of evaluation, taste panel selection & constitution, statistical analysis Quality problem in fishery products: good manufacturing practices. HACCP and ISO 9000 series of quality assurance system, validation and audit. national and international standards, EU regulation for fish	**15**

	export trade,	
IV	UNIT-IV: IDP and SAT formations in certification of export worthiness of fish processing units, regulations for fishing vessels pre-processing and processing plants, EU regulations. Factory sanitation and hygiene: National and international requirements, SSOP.	**10**
V	UNIT-V: Hazards in sea foods: Sea food toxins, biogenic amines, heavy metals and industrial pollutants. Infection and immunity, Microbial food poisoning, bacteria of public health significance in fish /fishery products / environments - Salmonella, Clostridia, Staphylococcus ,E. coli, Streptococcus, Vibrio, Aeromonas, Listeria, Yersinia, Bacillus. Laboratory techniques for detection and identification of food poisoning bacteria. Mycotoxins in cured fish, bacterial associated with fish disease.	**15**

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Title of the Paper: Animal Diversity Biology of Chordates.
Semester: - II

Course Code	ZOO T21A	Course Delivery Method	Class Room/Blended Mode - Both
Credits	4	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 : 2021-22	Year of Offering 2020-2021	Year of Revision – 2021-22	Percentage of Revision: 70%

Course Description:

This course will provide one with a basic and comprehensive understanding of *Pro chordates* and pisces origin, type study, respiratory, circulatory and nervous system etc., Enable the student with depth of topics and helps then to gain appreciation of Amphibia and Reptilia type studies, Aves and mammals type studies. On the other hand, importance of understanding parental care in amphibians, south indian chelonians, birds as glorified reptiles and significance of birds migration and flight adaptations in birds are learnt. A part from these the students will be enhanced with the knowledge of aquatic mammals and dentition in mammals.

Course Objectives:
☐☐To understand the structural organization of animals of prochordates and cyclostomes.
☐To understand the type study belonging to Pisces.
☐☐To understand type study belonging to amphibian.
☐☐To understand the type study belonging to reptilia and identification of piousness snakes.
☐☐To understand the type study belonging to Aves and Aquatic mammals.

Course Outcomes:

CO1	Gain knowledge in the major Chordate groups, describe their salient features, appreciate the diversity and analyze the uniqueness of different groups.
CO 2	Understand the fundamental organization of chordates and evaluate the similarities and differences among the different groups of chordates in the light o evolutionary significance.
CO 3	Comprehend and compare the morphology and anatomy of different classes of chordates and apply the same to their fitness in the ecological habitats
CO 4	Develop the skill of identifying the vertebrate fauna in general and South Indian fauna in specific.
CO 5	Acquaint with the significance of unique mechanisms and behavioral patterns exhibited by different groups of chordates.

Syllabus

Unit	Learning Units	Lecture Hours
I	**UNIT I** Protochordates to cyclostomes Protochordates Salient features of UrochordataandCephalochordata 1 hour Structure and life-history of *Herdmania*,2 hours Significance of retrogressive metamorphosis. 2 hours General organization of vertebrates1 hour General characters of cyclostomes 1 hour Comparison of *Petromyzon*and*Myxine*1 hour	8 hrs
II	**UNIT II** Fishes Type study – *Scoliodon* - Morphology, respiratory, circulatory, excretory and nervous systems and sense organs. 8hrs Migration in fishes. 1hour Viviparity in fishes 1 hour Types of scales 1 hour Accessory respiratory organs in fishes 2 hours	13 HOURS
III	**UNIT III** Amphibia South Indian Amphibians. 1 hour Type study - *Rana*: Morphology, digestive system, respiratory system circulatory system,excretory system, nervous system and reproductive system 9 hours Parental care in amphibians1 hour	11 HOURS
IV	**UNIT IV** Reptilia South Indian Chelonians. 2 hours Type study – *Calotes*: Morphology, digestive, respiratory, circulatory, urinogenital and nervous systems. 8hrs Identification of poisonous snakes 1hour	11 HOURS
V	**UNIT V** Aves and Mammalia Aves Birds as Glorified Reptiles. 2hours Type study-Pigeon (*Columbialivia*): Exoskeleton, respiratory, circulatory and excretory systems7 hours Significance of migration in birds 2 hours Flight adaptations in birds 2 hours Mammalia Aquatic Mammals 2 hours Dentition in Mammals. 2 hours	17 HOURS

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Title of the Paper: ANIMAL PHYSIOLOGY, CELLULAR METABOLISM ANDEMBRYOLOGY

Semester: - IV

Course Code	*ZOO-401*	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 : 2019-20	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 100%

CourseOutcomes:
This course will provide students with a deep knowledge in Physiology, Cellularmetabolism and Molecular Biology and by the completion of the course the graduate shallable to–
CO1:Understandthefunctionsofimportantanimalphysiologicalsystemsincludingdigestion,cardio-respiratoryand renal systems.
CO2:Understandthemuscularsystemandtheneuro-endocrineregulationofanimalgrowth,development andmetabolismwithaspecialknowledgeofhormonalcontrolofhumanreproduction.
CO3:Describe the structure,classification and chemistry of biomolecules andenzymesresponsiblefor sustenanceoflifeinlivingorganisms
CO4:Developbroadunderstandingthebasicmetabolicactivitiespertainingtothecatabolismand anabolismof various biomolecules
CO5 :Describe the key events in early embryonic development starting from the formationofgametesupto gastrulationand formation ofprimarygerm layers.

- LearningObjectives
- Toachieveathoroughunderstandingofvariousaspectsofphysiologicalsystemsand theirfunctioninginanimals.
- Toinstiltheconceptofhormonalregulationofphysiology,metabolismandreproductionin animals.
- Tounderstand the disordersassociated with thedeficiencyofhormones
- TodemonstrateathoroughknowledgeoftheintersectionbetweenthedisciplinesofBiologyand Chemistry.
- Toprovideinsightfulknowledgeonthestructureandclassificationofcarbohydrates,proteins,lipids and enzymes
- To demonstrate an understanding of fundamental biochemical principles suchas the function of biomolecules, metabolic pathways and the regulation ofbiochemicalprocesses
- To make students gain proficiency in laboratory techniques in biochemistryandorientthemtoapplythescientificmethodtotheprocessesofexperimentationand hypothesis testing.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	AnimalPhysiology -I Processofdigestionandassimilation Respiration - Pulmonary ventilation, transport of oxygen and CO2(Note:Need not studycellularrespiration here) Circulation-Structureandfunctioningofheart,Cardiaccycle Excretion - Structure and functions of kidney urine formation, counter currentMechanism	10
II	Animal Physiology –II Nerveimpulsetransmission-Restingmembranepotential,originandpropagationofactionpotentialsalongmyelinatedandnon-myelinatednervefibers Muscle contraction - Ultra structure of muscle, molecular and chemical basis ofmusclecontraction Endocrine glands - Structure, functions of hormones of pituitary, thyroid,parathyroid,adrenalglands and pancreas Hormonalcontrolof reproductionina mammal	15
III	CellularMetabolism–I (Biomolecules) Carbohydrates-Classificationofcarbohydrates.Structureofglucose Proteins-Classificationofproteins.Generalpropertiesofaminoacids Lipids-Classificationoflipids Enzymes:ClassificationandMechanismofAction	15
IV	CellularMetabolism–II Carbohydrate Metabolism - Glycol sis, Krebs cycle, Electron Transport Chain,Glycogenmetabolism,Gluconeogenesis LipidMetabolism–β-oxidationofpalmiticacid Proteinmetabolism–Transamination,DeaminationandUreaCycle	10
V	Embryology: Gametogenesis Fertilization Typesofeggs Typesofcleavages Developmentof Frogup toformationofprimarygerm layers	10

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Title of the Paper: IMMUNOLOGYANDANIMALBIOTECHNOLOGY

Semester: - IV

Course Code	ZOO-402	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 : 2019-20	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision:100%

CourseOutcomes:

Thiscoursewillprovidestudentswithadeepknowledgeinimmunology,genetics,embryologyand ecologyandbythecompletionofthecoursethegraduateshall able to–

CO1:Togetknowledgeoftheorgansof Immunesystem,typesof immunity,cellsandorgansof immunity.

CO2:Todescribeimmunologicalresponseastohowitistriggered(antigens)andregulated (antibodies)

CO3:UnderstandtheapplicationsofBiotechnologyinthefieldsofindustryandagricultureincluding animalcell/tissueculture, stemcelltechnologyandgeneticengineering.

CO4:Getfamiliarwiththetoolsandtechniquesofanimalbiotechnology.

- LearningObjectives
- Totracethehistoryanddevelopment of immunology
- Toprovidestudentswithafoundationinimmunological processes
- Tobeabletocompareandcontrasttheinnateversusadaptiveimmunesystemsandhumoral versuscell-mediated immuneresponses
- UnderstandthesignificanceoftheMajorHistocompatibilityComplexintermsofimmuneresponse and transplantation
- Toprovideknowledgeonanimalcellandtissuecultureandtheirpreservation
- Toempowerstudentswithlatestbiotechnologytechniqueslikestemcelltechnology, genetic engineering, hyridoma technology, transgenic technology andtheirapplication in medicineandindustryforthebenefit of livingorganisms
- Toexplain*invitro*fertilization,embryotransfertechnologyandotherreproductionmanipulation methodologies.
- To get insight in applications or recombinant DNA technology in agriculture,productionoftherapeuticproteins.
- Tounderstandprinciplesofanimalculture,mediapreparatio

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	Immunology –I(OverviewofImmune system) IntroductiontobasicconceptsinImmunology Innateandadaptiveimmunity,VaccinesandImmunization program Cellsofimmune system Organsofimmunesystem	**10**
II	Immunology –II (Antigens,Antibodies, MHCandHypersensitivity) Antigens:Basicpropertiesofantigens,BandTcellepitopes,haptensandadjuvants;Factors influencingimmunogenicity Antibodies:Structureof antibody,Classesand functionsofantibodies Structureandfunctionsofmajor histocompatibilitycomplexes ExogenousandEndogenouspathwaysofantigenpresentationandprocessing Hypersensitivity–ClassificationandTypes	**15**
III	Techniques AnimalCell,TissueandOrganculturemedia:NaturalandSyntheticmedia, Cellcultures:Establishmentofcellculture(primaryculture,secondaryculture, types of cell lines; Protocols for Primary Cell Culture); EstablishedCell lines (common examples such as MRC, HeLa, CHO, BHK, Vero); Organ culture;Cryopreservation of cultures Stem cells:Typesof stem cells andapplications Hybridoma Technology: Production & applications of Monoclonal antibodies(mAb)	**15**
IV	Genetic Engineering:Basic concept, Vectors, Restriction End nucleases andRecombinantDNAtechnology Gene delivery:Microinjection, electroporation, biolistic method (gene gun),liposome and viral-mediated genedelivery Transgenic Animals: Strategies of Gene transfer; Transgenic - sheep, - fish; applications Manipulationofreproduction inanimals:Artificial Insemination,*Invitro* Fertilization,superovulation, Embryo transfer,Embryo cloning	**10**
V	PCR:BasicsofPCR. DNA Sequencing: Sanger's method of DNA sequencing- traditional andautomated sequencing (2 hrs) Hybridization techniques:Southern,Northernand Westernblotting DNAfingerprinting:Procedureandapplications Applicationsin IndustryandAgriculture: Fermentation:Different types of Fermentation and Downstream processing; Agriculture: Monocultureinfishes, polyploidyinfishes	**10**

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Title of the Paper:**Immunology**

Semester: - VI

Course Code	**ZOO-601C**	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 : 2019	Year of Offering 2021-2022	Year of Revision – 2021-22	Percentage of Revision: 0%

Unit	Learning Units	Lecture Hours
I	UNIT- I: **Overview of Immune system** Introduction to basic concepts in Immunology. Innate and adaptive immunity ***Cells and organs of Immune system** Cells of immune system Organs of immune system	10
II	UNIT-II:**Antigens** Basic properties of antigens B and T cell epitopes, haptens and adjuvants Factors influencing immunogenicity	**10**
III	UNIT-III: **Antibodies** Structure of an antibody Classes and functions of antibodies Antigen and antibody interactions. Monoclonal antibodies and their production.	**15**
IV	UNIT-IV: **Working of an Immune system** Structure and functions of major histocompatibility complexes Exogenous and Endogenous pathways of antigen presentation and processing Basic properties and functions of mediator molecules.	**15**

	(cytokines, interferonsand complement proteins). ==Mechanisms of humoral and cell mediated immunities==	
V	UNIT-V: **Immune system in health and disease** ==Classification and brief description of various types of hyper sensitivities== Introduction to concepts of autoimmunity and immunodeficiency ***Vaccines** General introduction to vaccines ==Types of vaccines==	**10**