B.TECH INFORMATION TECHNOLOGY

REGULATIONS 2013

CURRICULUM & SYLLABUS
(1st SEMESTER to 8th SEMESTER)

Approved in the Academic Council Meeting held on 16.07.2016

CHAIRMAN
ACADEMIC COUNCIL
B.TECH INFORMATION TECHNOLOGY

REGULATIONS 2013

CURRICULUM & SYLLABUS
(1st SEMESTER to 8th SEMESTER)

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CHAIRMAN
BOARD OF STUDIES
DEPT. OF INFORMATION TECHNOLOGY

CHAIRMAN
ACADEMIC COUNCIL
SETHU INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Estd. 1995

REGULATIONS 2013

CURRICULUM AND SYLLABI FOR
B.TECH INFORMATION TECHNOLOGY

(FOR THE STUDENTS ADMITTED FOR THE ACADEMIC YEAR 2014-2015 ONWARDS)
SETHU INSTITUTE OF TECHNOLOGY  
(An Autonomous Institution)  
REGULATIONS 2013  

Bachelor of Technology in Information Technology  

OVERALL COURSE STRUCTURE  

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Total No. of Credits - 22

### Semester VIII

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**Total**

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# LIST OF ELECTIVES

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**Note:** Student may choose any one of the electives offered by the other branch of study.
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Total No. of Credits - 26
TECHNICAL ENGLISH - I

01UEN101
(Common to ALL Branches)

COURSE OBJECTIVE:
- To improve the language proficiency of students
- To enhance the vocabulary of students
- To strengthen the language competency through grammar

UNIT I
9+3
Listening- Conversation Practice; Speaking- Observing the diagram and speaking on the topic, Explaining daily routines; Reading- Reading Comprehension, Referring to the Dictionary and identifying the functions of words; Writing- Paragraph Writing (Writing for a given situation); Grammar- Parts of Speech, Introduction of Present Tense and its four sub divisions; Vocabulary- Prefix and Suffix, Synonyms and Antonyms

UNIT II
9+3
Listening- Listening to Inspiring Speeches and Instructions; Speaking- Narrating Stories, Self Introduction; Reading- Reading Short Stories, Newspaper Articles, Skimming; Writing- Summary Writing, Hints Developing, Letter Writing- Informal Letters; Grammar- Introduction of Past Tense and its four sub divisions, Voice- Active and Passive- Conversion of Assertive Sentences; Punctuation & Spelling, Vocabulary - Homonyms and Homophones, Idioms and Phrases

UNIT III
9+3
Listening- Completing the task of drawing a diagram based on instructions; Speaking- Review of a Movie, Seeking Permission, Reading- Note Making Skills, Writing- Letter Writing- Formal Letters-Letter to the Editor; Grammar- Introduction of Future Tense and its four sub divisions, Subject-Verb Agreement, Voice- Active and Passive-Conversion of Interrogative and Imperative Sentences; Vocabulary- British and American Words.

UNIT IV
9+3
Listening- Comprehension Passage, Tracing geographical locations through instructions; Speaking- Explaining Pictures of their choice, Making Requests; Reading- Reading Profiles of Leading Companies and Personalities; Writing- Writing Review of a Book/ Movie/ Journal, Report Writing; Grammar- Regular and Irregular Verbs, Instructions, Connectives-Discourse Markers; Vocabulary- Foreign Words

UNIT V
9+3
Listening- Listening to informal conversations and participating; Speaking- Expressing Opinions, Asking for directions using polite expressions, Giving directions by using imperative sentences; Reading- Reading Job Advertisements, Skimming and Scanning; Writing- Process Description; Grammar- Numerical Adjectives, Sequencing Words, Spelling; Vocabulary- One Word Substitutions

Total: 45+15 Periods
LEARNING OUTCOMES:
After successful completion of this course the students will be able to:
• Use grammar effectively in writing meaningful sentences and paragraphs.
• Exhibit improved reading comprehension and vocabulary.
• Demonstrate writing skills in various formal situations.
• Demonstrate improved oral fluency.
• Presenting reports on various purposes.

TEXT BOOKS:

SUGGESTED BOOK FOR READING:

REFERENCE BOOKS:
COURSE OBJECTIVE:
- To identify algebraic eigen value problems from practical areas and obtain the eigen solutions in certain cases
- To study three dimensional analytical geometry, the properties of lines and planes in space
- To understand effectively the geometrical aspects of curvature, involutes and evolutes of plane curves, essential concepts for an engineer, as elegant applications of differential calculus
- To learn the method of solving differential equations of certain types, including systems of differential equations that they might encounter in their studies of other subjects in the same or higher semesters.

UNIT I   MATRICES  8+3
Eigenvalue and eigenvector of a real matrix – Characteristic equation – Properties – Cayley - Hamilton theorem (excluding proof) – Orthogonal transformation of a symmetric matrix to diagonal form – Quadratic form – Reduction of quadratic form to canonical form by orthogonal transformation

UNIT II   THREE DIMENSIONAL ANALYTICAL GEOMETRY  9+3

UNIT III   DIFFERENTIAL CALCULUS  8+3
Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes – Evolute as envelope of normals

UNIT IV   FUNCTIONS OF SEVERAL VARIABLES  8+3

UNIT V   MULTIPLE INTEGRALS  9+3
Double integration – Cartesian and polar coordinates – Change of order of integration – Change of variables between Cartesian and polar coordinates – Triple integration in Cartesian co-ordinates – Area as double integral – Volume as triple integral

SUPPLEMENT TOPIC:  3
Evocation / Application of Mathematics, Quick Maths – Speed Multiplication and Division (for internal evaluation only)

LEARNING OUTCOMES:
After successful completion of this course the students will be able to:
- Find the derivative of the given function and its successive differentiation.
- Predict the extreme values of functions with constraints and fine the absolute maximum and minimum of a given function on different domains.
- Apply the various methods of integration for evaluating definite integrals.
- Demonstrate the use of double and triple integrals to compute area and volume.
- Find inverse and positive power of given matrix using Cayley Hamilton Theorem and reduce to canonical form by orthogonal transformation.
TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVE:
- To have a clear knowledge of principles and applications of ultrasonics
- To understand the working method of different kinds of laser
- To learn the types of fibre and communication applications
- To know the basic principles of Quantum theory
- To develop the fundamental research interest in crystal physics

UNIT I  ULTRASONICS

UNIT II  LASERS

UNIT III  FIBER OPTICS AND APPLICATIONS
Introduction – Structure of optical fibre- Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle - Types of optical fibres (material, refractive index, modes)-Double crucible technique of fibre drawing - Splicing, Loss in optical fibre – attenuation, dispersion, bending Fibre optical communication system (Block diagram) – fibre optic sensors- Endoscope

UNIT IV  QUANTUM PHYSICS
Black body radiation – Planck”s theory (derivation) – Wien”s displacement law and Rayleigh – Jeans” Law – Compton effect. Theory and experimental verification – Matter waves - Schrödinger”s wave equation – Time independent and time dependent equations – Physical significance of wave function – Particle in a one dimensional box - Electron microscope Scanning electron microscope - Transmission electron microscope

UNIT V  CRYSTAL PHYSICS
Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – d spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – NaCl, ZnS, diamond and graphite structures – Polymorphism and allotropy - Crystal defects – point, line and surface defects- Burger vector

Total: 45 Periods
LEARNING OUTCOMES:
After successful completion of this course the students will be able to:
• Analyze the basic concepts of crystalline materials and the various crystal Structure like FCC, BCC, HCP etc.
• Apply the ultrasonic concepts in different industries for the development of different instruments which has practical applications in submarine to aerospace applications.
• Demonstrate understanding of and be able to solve problems on operations and basic properties of the laser types like CO2 laser, diode laser etc.,
• Apply the quantum mechanical model to explain the behaviour of a system at microscopic level
• Explain the behaviour of bending beams and calculate the expression for young's modulus

TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVE:
- To know about the principles of electrochemistry, emf and applications of emf measurements
- To understand the basics of photochemistry
- To learn about corrosion control methods
- To know about the industrial applications of surface chemistry
- To learn the analytical techniques and their importance

UNIT I  ELECTRO CHEMISTRY
Electrode – single electrode potential, Nernst equation (problem), reference electrodes - standard hydrogen electrode – calomel electrode, glass electrode, measurement of pH; cells – EMF – measurement of emf, reversible and irreversible cells, electrolyte concentration cells and applications, electrochemical series – significance, potentiometric titrations (redox - \( \text{Fe}^{2+} \text{ vs dichromate and precipitation – } \text{Ag}^+ \text{ vs. Cl}^- \text{ titrations} \)) and Conductometric titrations (HCl vs. NaOH).

UNIT II  PHOTO CHEMISTRY
Photochemical reaction: classification - thermal and photochemical reactions; laws of photochemistry - Grothus –Droper Law, Stark Einstein Law (problems); Quantum yield and determination (problems); photochemical synthesis of HCl and HBr – Jablonski diagram; fluorescence and phosphorescence, chemiluminescence, photosensitisation, applications; photosynthesis, photoinhibitors; applications in chemical synthesis, photo lithography and thin film coating.

UNIT III  CORROSION AND CORROSION CONTROL
Corrosion: Types - Chemical and electrochemical – mechanisms; different forms – galvanic, pitting, stress corrosion cracking and differential aeration corrosion; factors influencing corrosion; corrosion control – sacrificial anode and impressed cathodic current methods, corrosion inhibitors; protective coatings: paints – constituents and functions; metallic coatings – electroplating of Au and electroless plating of Ni.

UNIT IV  SURFACE CHEMISTRY
Adsorption: types – physical and chemical adsorption, adsorption of gases on solids; adsorption isotherms – Freundlich and Langmuir isotherms; adsorption of solutes from solution; ion -exchange adsorption; adsorption in pollution abatement (Granular activated carbon and powdered activated carbon); removal of heavy metals from effluents-coagulation, sedimentation and filtration; catalysis-characteristics, autocatalysis, catalytic poisoning and promoters

UNIT V  INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS
Beer-Lambert’s law: definition, derivation and simple problems– UV-visible – types of transitions, chromophores and auxochromes, Instrumentation (block diagram only), applications-Estimation of iron, AAS - principle - Instrumentation- (block diagram only)- applications-Estimation of nickel, Flame photometry- principle - Instrumentation- (block diagram only)- applications-Estimation of sodium; XRD: principle and applications

Total: 45 Periods
LEARNING OUTCOMES:
After successful completion of this course the students will be able to:

- Understand emf and its measurements, electrodes etc, which boost up their skill in circuit development for different applications.
- Gain knowledge about the materials that can be used to protect the electronic devices.
- Treat complex electrical/electronic systems and signals through modeling, simulation, experimentation and interpretation and analysis of data.

TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVE:
- To enable the students to read and write C programs
- To understand the organization of computers
- To learn about the programming constructs of C

UNIT I INTRODUCTION

UNIT II C PROGRAMMING BASICS

UNIT III ARRAYS AND STRINGS

UNIT IV FUNCTIONS AND POINTERS

UNIT V STRUCTURES ,UNIONS AND FILE HANDLING
Introduction – need for structure data type – structure definition – Structure declaration – Structure within a structure - Union - Programs using structures and Unions – Storage classes, Pre-processor directives –File handling.

LEARNING OUTCOMES:
After successful completion of this course the students will be able to:
- Illustrate the basics about computer
- Develop simple programs
- Develop simple programs using branching and looping constructs.
- Write C program using arrays, strings and functions.
- Write C programs for simple applications

Total: 45 Periods
TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVE:
- To develop in students graphic skill for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION)

UNIT I  PLANE CURVES AND FREE HAND SKETCHING  15
Curves used in engineering practices: (Not for Examination)
Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of squad and circle – Drawing of tangents and normal to the above curves.
Orthographic Projection:
Representation of Three Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT II  PROJECTION OF POINTS, LINES AND PLANE SURFACES  14
Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT III  PROJECTION OF SOLIDS  15
Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT IV  SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES  15
Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section. Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones.

UNIT V  ISOMETRIC AND PERSPECTIVE PROJECTIONS  15
ISOMETRIC PROJECTIONS
Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones.
PERSPECTIVE PROJECTIONS (Not for Examination)
Perspective projection of prisms, pyramids and cylinders by visual ray method.

Total: 75 Periods
LEARNING OUTCOMES:
After successful completion of this course the students will be able to:
- Understand the basics of orthographic and isometric projections
- Generate engineering drawing and relate it to day to day life
- Apply this basic knowledge throughout the carrier

TEXT BOOKS:

REFERENCE BOOKS:

Publication of Bureau of Indian Standards:

Special points applicable to End Semester Examinations on Engineering Graphics:
1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. Whenever the total number of candidates in a college exceeds 150, the End Semester Examination in that college will be conducted in two sessions (FN and AN on the same day) for 50 percent of student (approx) at a time.
LIST OF EXPERIMENTS

a) Word Processing
   1. Document creation, Text manipulation with Scientific notations.
   2. Table creation, Table formatting and Conversion.
   4. Drawing - flow Chart

b) Spread Sheet
   5. Chart - Line, XY, Bar and Pie.
   6. Formula - formula editor.
   7. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
   8. Sorting and Import / Export features.

c) Power point
   9. Simple presentation using power point

d) Simple C Programming
   11. Arrays
   12. Structures and Unions
   13. Functions
   14. Files

COURSE OUTCOMES
After successful completion of this course the students will be able to:

- Create the document in Word Processing software.
- Write programs using control constructs.
- Apply functions to reduce redundancy.
- Design and implement C programs for simple applications

Total: 45 Periods
LIST OF EXPERIMENTS

GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE 9

BUILDINGS:
  a) Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

PLUMBING WORKS:
  (a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
  (b) Study of pipe connections requirements for pumps and turbines.
  (c) Preparation of plumbing line sketches for water supply and sewage works.
  d) Hands-on-exercise:
     Basic pipe connections–Mixed pipe material connection Pipe connections with different joining components.
  (e) Demonstration of plumbing requirements of high-rise buildings.

CARPENTRY USING POWER TOOLS ON
  (a) Study of the joints in roofs, doors, windows and furniture.
  (b) Hands-on-exercise:
     Wood work, joints by sawing, planning and cutting.

II MECHANICAL ENGINEERING PRACTICE 13

Welding:
  (a) Preparation of arc welding of butt joints, lap joints and tee joints.
  (b) Gas welding practice.

Basic Machining:
  (a) Simple Turning and Taper turning.
  (b) Drilling Practice

Sheet Metal Work:
  (a) Forming & Bending.
  (b) Model making – Trays, funnels, etc.
  (c) Different type of joints.

Machine assembly practice:
  (a) Study of centrifugal pump
  (b) Study of air conditioner

Demonstration on:
  (a) Smithy operations, upsetting, swaging, setting down and bending.
     Example – Exercise – Production of hexagonal headed bolt.
  (b) Foundry operations like mould preparation for gear and step cone pulley.
  (c) Fitting – Exercises – Preparation of square fitting and vee – fitting models.
GROUP B (ELECTRICAL & ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE

(a) Residential house wiring using switches, fuse, indicator, lamp and energy meter.
(b) Fluorescent lamp wiring.
(c) Stair case wiring.
(d) Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.
(e) Measurement of energy using single phase energy meter.
(f) Measurement of resistance to earth of electrical equipment.

IV ELECTRONICS ENGINEERING PRACTICE

(a) Study of Electronic components and equipments – Resistor, colour coding measurement of AC
    Signal parameter (peak-peak, rms, period, frequency) using CRO.
(b) Study of logic gates
(c) Generation of Clock Signal.
(d) Soldering practice – Components, Devices and Circuits – Using general purpose PCB.
(e) Measurement of ripple factor of HWR and FWR.

Course Outcomes:
After successful completion of this course the students will be able to:
- Organize the day to day work (basic work) that are carried out in industries, building constructions
  and also is in real life
- Perform basic plumbing work and carpentry work
- Execute the welding, basic machining, sheet metal work, basic wiring, soldering etc.
- Demonstrate the basic engineering work to others
- Solve the problems that are encountered in basic engineering work.

Total: 45 Periods
PHYSICS LABORATORY

List of Experiments
1. Semiconductor Laser - Particle size determination using Diode Laser.
2. Determination of thickness of a thin wire – Air wedge method.
4. Determination of Young’s modulus of the material – Uniform bending.
5. Torsional pendulum – Determination of rigidity modulus of a given wire and Moment of inertia of a metallic disc.
6. Determination of Young’s modulus of the material – Non uniform bending.
   • A minimum of five experiments shall be offered

CHEMISTRY LABORATORY

List of Experiments
1. Estimation of Copper in brass by EDTA
2. Conductometric titration (simple acid base)
3. Conductometric titration (Mixture of weak and strong acids)
4. Conductometric titration (BaCl₂ Vs Na₂SO₄)
5. Potentiometric titration (Fe²⁺ / KMnO₄ or K₂Cr₂O₇)
6. pH titration (acid & base)
7. Determination of molecular weight of a Polyvinyl Alcohol by Viscometry method
   • A minimum of five experiments shall be offered

Course Outcomes:
After successful completion of this course the students will be able to:
• Determine the velocity and compressibility of liquid
• Calculate the moment of inertia and rigidity modulus
• Determine the molecular weight of the polymer and composition of alloys
• Determine the accurate endpoint in volumetric analysis using analytical instruments
• Determine the acidic and basic nature of the solution using pH meter

Total: 30 Periods
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Total No. of Credits - 26
TECHNICAL ENGLISH – II
(Common to ALL Branches)

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COURSE OBJECTIVE:
- To help the students acquire listening and speaking skills in their real life situations
- To develop professional skills for emancipation of students’ Personality

UNIT I
9+3
Listening- Listening to Telephonic Conversations; Speaking- Offering Suggestions, Introducing others; Reading- Skimming, Scanning and Skipping; Writing-Formal Letters-Writing letters to Head of the Institution; Grammar-Prepositions, Conjunctions, Infinitives; Vocabulary-Prepositional Phrases.

UNIT II
9+3
Listening- Performing Various Tasks Based on Audio Tracks; Speaking- Role Play Practice, Jargons - Expression used to Define Technical Vocabulary; Reading- Fast Reading; Writing-Minutes of the Meeting, Preparing Agenda; Grammar- Direct and Indirect Speech, Conditional Clauses, Gerunds and Participles, Vocabulary- Collocations.

UNIT III
9+3
Listening- Introduction to Phonetic Symbols ; Speaking- Speaking sentences with Stress and Intonations; Reading-Cloze Test ; Writing- Writing a Lab Report, Persuasive Paragraph writing; Grammar-Framing Questions, Types of Sentences; Vocabulary- Compound Nouns, Matching Words with meanings

UNIT IV
9+3
Listening- Listening and Guided Note Taking; Speaking- Persuasive Strategies, Presentations of Problems and Solutions, Reading- Contextual Reading, Anthology of Short Stories and poems; Writing- Letter Writing ( Inviting, Accepting and Declining), ; Grammar- Modal verbs, Articles; Sentence Completion; Vocabulary- Derivatives of Root Words.

UNIT V
9+3
Listening- Critical Analysis of Presentation and Group Discussion; Speaking- Interview Skills; Reading- Editing the E-mail after Reading the Context; Writing-Writing Recommendations and Job Application with Resume; Grammar- Simple, Compound and Complex sentences, Vocabulary-Words Often Confused and Misused

LEARNING OUTCOMES:
After successful completion of this course the students will be able to:
- Read, understand, analyse and discuss technical papers
- Participate confidently and effectively in group discussion
- Write clear and concise technical paper, resume, report and email.
- Demonstrate comprehension of content and vocabulary

Total: 45+15 Periods
TEXT BOOKS:

SUGGESTED BOOK FOR READING:

REFERENCE BOOKS:
COURSE OBJECTIVE:
- To study the basics of vector calculus comprising of gradient, divergence and curl, and line, surface and volume integrals and the classical theorems involving them
- To understand analytic functions and their interesting properties which could be concentrated in a few engineering areas, and be introduced to the host of conformal mappings with a few standard examples that have direct application
- To acquire knowledge of Laplace transform and its properties and sufficient exposure to solution of certain linear differential equations using the laplace transform technique

UNIT I  ORDINARY DIFFERENTIAL EQUATIONS  8+3
Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy’s and Legendre’s linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT II  VECTOR CALCULUS  8+3

UNIT III  ANALYTIC FUNCTIONS  8+3
Functions of a complex variable – Analytic functions – Necessary conditions, Cauchy – Riemann equation and Sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping: w = z+c, cz, 1/z, and bilinear transformation.

UNIT IV  COMPLEX INTEGRATION  9+3
Statement and applications of Cauchy’s integral theorem and Cauchy’s integral formula – Taylor and Laurent expansions – Singular points – Residues – Residue theorem – Application of residue theorem to evaluate real integrals – Unit circle and semi-circular contour(excluding poles on boundaries).

UNIT V  LAPLACE TRANSFORM  9+3

SUPPLEMENT TOPIC:  3
Evocation / Application of Mathematics, Arithmetical Ability – Time and Work – Time and Distance (for internal evaluation only)

Total: L + T: 45 + 15 = 60 Periods
LEARNING OUTCOMES:
After successful completion of this course the students will be able to:
- Solve first and higher order ordinary differential equations analytically and able to apply differential calculus to solve engineering problems.
- Find the integral value using the suitable method like Greens Theorem, Gauss divergence Theorem, Stokes Theorem.
- Construct an analytic function using various methods .Also able to convert a function from one domine to another domine using bilinear transformation.
- Evaluate the values of a contour integral around a given contour in the complex plane.
- Apply Laplace transform to solve Ordinary differential equations.

TEXT BOOKS:

REFERENCE BOOKS:
5. Agarwal R.S., “Quantitative Aptitude”, S.Chand Publications
COURSE OBJECTIVE:
- To get a clear knowledge of principles and applications of conducting materials
- To understand the principles and working knowledge semiconductor
- To know the basic principles of magnetic materials and superconductivity
- To know the basic principles optical materials and dielectrics
- To develop the fundamental research interest in nano materials

UNIT I CONDUCTING MATERIALS 9

UNIT II SEMICONDUCTING MATERIALS 9
Intrinsic semiconductor – carrier concentration derivation in n-type and p-type semiconductor – Fermi level – Variation of Fermi level with temperature – extrinsic semiconductors – carrier concentration derivation in n-type and p-type semiconductor – variation of Fermi level with temperature and impurity concentration – Hall effect – Determination of Hall coefficient – Applications

UNIT III MAGNETIC MATERIALS AND SUPERCONDUCTIVITY 9

UNIT IV OPTICAL MATERIALS AND DIELECTRIC MATERIALS 9
Optical properties of metals, insulator and Semiconductor-Phosphorescence and fluorescence- Excitons, traps and colourcentres and their importance-different phosphors used in CRO screen- Liquid crystal as display material-Thermography and its applications. Dielectric Materials: Electrical susceptibility-Dielectric constant-Electronic,ionic,orientational and space charge polarization- Frequency and temperature dependence of polarization-Internal field-Clausius Mosotti relation(Derivation)

UNIT V NEW ENGINEERING MATERIALS 9

Total: 45 Periods
LEARNING OUTCOMES:

After successful completion of this course the students will be able to:

- Analyze the basic concepts of crystalline materials and the various crystal Structure like FCC, BCC, HCP, etc.
- Apply the ultrasonic concepts in different industries for the development of different instruments which has practical applications in submarine to aerospace applications.
- Demonstrate understanding of and be able to solve problems on operations and basic properties of the laser types like CO2 laser, diode laser etc.,
- Apply the quantum mechanical model to explain the behaviour of a system at microscopic level
- Explain the behaviour of bending beams and calculate the expression for young's modulus

TEXT BOOKS:


REFERENCE BOOKS:

COURSE OBJECTIVE:
- To understand the effect of technology on the environment and ecological balance and make the student sensitive to the environment problems in every professional endeavour that he/she participates

UNIT I  ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY  10
- Field study of common plants, insects, birds
- Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II  ENVIRONMENTAL POLLUTION  9
Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Solid waste management: Causes, effects and control measures of municipal solid wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.
Field study of local polluted site – Urban / Rural / Industrial / Agricultural

UNIT III  NATURAL RESOURCES  9
Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, food adulteration, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – Role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.
– Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV  SOCIAL ISSUES AND THE ENVIRONMENT

UNIT V  HUMAN POPULATION AND THE ENVIRONMENT

LEARNING OUTCOMES:
After successful completion of this course the students will be able to:

- Express the concepts of ecosystem and biodiversity.
- Describe about the impact of environmental pollution.
- State the various types of energy resources.
- Explain the importance of environmental issues in the society.
- Analyze the impact of environmental issues related to human health.

TEXT BOOKS:

REFERENCE BOOKS:

Total: 45 Periods
COURSE OBJECTIVE:
- To understand the fundamentals of thermal systems
- To understand the basics of building construction and infrastructures

A – CIVIL ENGINEERING

UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS
Civil Engineering Materials:

UNIT II BUILDING COMPONENTS AND STRUCTURES

B – MECHANICAL ENGINEERING

UNIT III POWER PLANT ENGINEERING

UNIT IV IC ENGINES
10 Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler as a power plant.

UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM

Total: 60 Periods

LEARNING OUTCOMES:
After successful completion of this course the students will be able to:
- Understand the fundamentals of thermal systems
- Basic knowledge on construction of infrastructures
TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVE:
- To understand different methods used for the simplification of Boolean functions
- To design and implement combinational circuits
- To design and implement synchronous sequential circuits
- To design and implement asynchronous sequential circuits
- To study the fundamentals of VHDL / Verilog HDL

UNIT I  BOOLEAN ALGEBRA AND LOGIC GATES  8
Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems - Boolean functions – Simplifications of Boolean functions using Karnaugh map and tabulation methods – Implementation of Boolean functions using logic gates

UNIT II  COMBINATIONAL LOGIC  9
Combinational circuits – Analysis and design procedures - Circuits for arithmetic operations - Code conversion – Introduction to Hardware Description Language (HDL)

UNIT III  DESIGN WITH MSI DEVICES  8
Decoders and encoders - Multiplexers and de multiplexers - Memory and programmable logic - HDL for combinational circuits

UNIT IV  SYNCHRONOUS SEQUENTIAL LOGIC  10
Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters – HDL for Sequential Circuits

UNIT V  ASYNCHRONOUS SEQUENTIAL LOGIC  10
Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race-free state assignment – Hazards. ASM Chart

Total: 45 Periods

LEARNING OUTCOMES:
After successful completion of this course the students will be able to:
- Apply arithmetic operations in any number system.
- Compare Boolean simplification techniques.
- Design a combinational circuit for arithmetic operations.
- Explain various types of memory and it’s working.
- Analyze and design a given sequential digital circuit.

TEXT BOOKS:
REFERENCE BOOKS:

LIST OF EXPERIMENTS

1. Verification of Boolean theorems using digital logic gates
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices
4. Design and implementation of parity generator / checker using basic gates and MSI devices
5. Design and implementation of magnitude comparator
6. Design and implementation of application using multiplexers/ Demultiplexers
7. Design and implementation of Shift registers
8. Design and implementation of Synchronous and Asynchronous counters
9. Simulation of combinational circuits using Hardware Description Language (VHDL/Verilog HDL software required)
10. Simulation of sequential circuits using HDL (VHDL/ Verilog HDL software required)

COURSE OUTCOMES:

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

- Use Boolean simplification techniques to design a combinational hardware circuit.
- Test the Boolean theorems.
- Design combinational and sequential circuits.
- Analyze a given digital circuit – combinational and sequential.
- Design the different functional units in a digital computer system.
LIST OF EXPERIMENTS

1. UNIX COMMANDS
   Study of Unix OS - Basic Shell Commands - Unix Editor.

2. SHELL PROGRAMMING
   Simple Shell program - Conditional Statements - Testing and Loops

3. C PROGRAMMING ON UNIX
   Dynamic Storage Allocation-Pointers-Functions-File Handling

COURSE OUTCOMES:

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

- Use string handling functions in C programs.
- Write programs using pointers.
- Differentiate structures and unions.
- Employ Memory allocation techniques in programs.
- Apply the file concepts to handle the data.
PHYSICS & ENVIRONMENTAL SCIENCE LABORATORY
(Common to ALL Branches)

01UGS210

PHYSICS LABORATORY

List of Experiments
1. Determination of Band Gap of a semiconductor
3. Spectrometer – To find the dispersive power of a prism
5. To verify Newton’s law of cooling of different liquid and to draw the cooling curve.

- A minimum of five experiments shall be offered

ENVIRONMENTAL SCIENCE LABORATORY

List of Experiments
1. Determination of pH of water sample
2. Determination of electrical conductivity of water sample
3. Estimation of hardness of Water by EDTA method
4. Estimation of alkalinity of water sample
5. Estimation of Chloride in Water sample (Argentometric method)
6. Determination of DO in water (Winkler’s method)
7. Determination of acidity of water sample

- A minimum of five experiments shall be offered

Total: 30 Periods

COURSE OUTCOMES:

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

- Explain the concepts of Lasers and its applications.
- Calculate the dispersive power using spectrometer
- Determine the thermal conductivity of a bad conductor.
- Determine the quality of water, soil and industrial effluents
- Determination of acidity of industrial effluents
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Total No. of Credits - 25
OBJECTIVES:
- To make the student knowledgeable in formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results.
- To familiarize the students to formulate and identify certain boundary value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve them numerically and interpret the results.
- To acquaint the student with the basics of Z-transform in its applicability to discretely varying functions, gained the skill to formulate certain problems in terms of difference equations and solve them using the Z-transform technique bringing out the elegance of the procedure involved.

UNIT I  FOURIER SERIES

UNIT II  FOURIER TRANSFORM

UNIT III  Z-TRANSFORM AND DIFFERENCE EQUATIONS

UNIT IV  APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS

UNIT V  NUMERICAL SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS
Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Find the Fourier series of the given function in the given range
- Find Fourier transform for a given function
- Solve the difference equation using Z transform
- Solve the Partial differential equation using various methods
- Apply partial differential equation to solve wave and heat equation
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To familiarize the design and applications of linear, tree, balanced tree, hashing, set and graph structures
- To demonstrate the systematic way of solving problems
- To explain implementation techniques using different data structures

UNIT I  LINEAR STRUCTURES
Abstract Data Types (ADT) – List ADT – Array-based implementation – Linked list implementation – Doubly-linked lists – Applications of lists – Stack ADT – Queue ADT – Circular queue implementation – Applications of stacks and queues.

UNIT II  TREE STRUCTURES
Tree ADT – tree traversals – left child right sibling data structures for general trees – Binary Tree ADT – expression trees – Applications of trees – Binary search tree ADT – Threaded Binary Trees.

UNIT III  BALANCED TREE

UNIT IV  HASHING AND SET

UNIT V  GRAPHS

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the knowledge in types of data structures to solve the related problems in relevant applications.
- Apply the knowledge of tree data structures to find solutions to complex problems related to data search, storage and retrieval.
- Identify the issues in balanced trees and analyze them to solve the relevant problems.
- Analyze hashing and set techniques for achieving reliable data search and retrieval.
- Apply the concept of graph data structures to solve suitable applications.

TEXTBOOKS:
REFERENCE BOOKS:
OBJECTIVES:

- To introduce the basic structure and operation of a digital computer
- To demonstrate the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division
- To familiarize the concepts of pipe lining, memory systems, I/O devices and standard I/O interfaces

UNIT I  BASIC STRUCTURE OF COMPUTERS  9

UNIT II  COMPUTER ARITHMETIC  9
Addition and subtraction of signed numbers - Design of fast adders - Multiplication of positive numbers - Signed operand multiplication and fast multiplication - Integer division - Floating point numbers and operations - Nano programming.

UNIT III  BASIC PROCESSING UNIT AND PIPELINING  9

UNIT IV  MEMORY SYSTEM  9

UNIT V  I/O ORGANIZATION  9
Accessing I/O devices – Programmed Input / Output -Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and Processors - CPU Processor Comparison – Intel Core i7 vs. i5 vs. i3.

TOTAL: 45 PERIODS

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

- Understand the basic components of a computer, including CPU, memories, and input/output, and their organization
- Explain the arithmetic operations of binary number system.
- Design a pipeline for consistent execution of instructions with minimum
- Adapt a wide variety of memory technologies both internal and external.
- Apply various I/O operations.
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To explain the basic concepts of OOPs, benefits of OOPs and applications of OOPs
- To summarize various ways of handling exceptions, files and various OOPs features
- To demonstrate OOPs concepts with data structures

UNIT I  INTRODUCTION

UNIT II  CONSTRUCTORS AND DESTRUCTORS

UNIT III  TEMPLATES AND EXCEPTIONS
Function and class templates - Exception handling – try-catch-throw paradigm – exception specification – terminate and unexpected functions – Uncaught exception.

UNIT IV  INHERITANCE AND POLYMORPHISM

UNIT V  INPUT/OUTPUT WITH FILES
Streams and formatted I/O – I/O manipulators - file handling – random access – object serialization – namespaces - std namespace – ANSI String Objects – standard template library - Applications of OOP to data structures

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Summarize basic oops concepts for an appropriate application
- Develop programs using constructors and destructors
- Identify exception handling mechanisms
- Describe Templates for time conventional programming
- Construct object oriented Programs using files
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the basic concepts of database system design and architecture
- To familiarize the Normal forms
- To demonstrate the transaction, recovery controls and storage techniques

UNIT I  INTRODUCTION

UNIT II  RELATIONAL MODEL

UNIT III  DATABASE DESIGN

UNIT IV  TRANSACTIONS

UNIT V  IMPLEMENTATION TECHNIQUES

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the knowledge of database systems to construct an E-R model for any applications.
- Design a DBMS for an application using Relational Models.
- Select and apply appropriate techniques to develop a normalized database.
- Analyze the various storage techniques to improve the query processing.
- Identify the issues in emerging database technologies
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To familiarize the concepts, circuit analysis and techniques from basic communications systems to digital communications
- To explain the strengths and weaknesses of various communication systems
- To summarize the modeling and simulation characteristics of communication networks

UNIT I  FUNDAMENTALS OF ANALOG COMMUNICATION  9
Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves.

UNIT II  DIGITAL COMMUNICATION  9
Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying – QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costas loop, DPSK.

UNIT III  MODELLING OF COMMUNICATION SYSTEM AND CHANNEL MODELS  9
Model of speech and picture signals, Pseudo noise sequences, Non-linear sequences, Analog channel model, Noise and fading, Digital channel model-Gilbert model of bustry channels, HF, Troposcatter and satellite channels, Switched telephone channels, Analog and Digital communication system models, Light wave system models.

UNIT IV  DIGITAL TRANSMISSION  9
Introduction, Pulse modulation, PCM – PCM sampling, sampling rate, signal to quantization noise rate, companding – analog and digital – percentage error, delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission – Inter symbol interference, eye patterns.

UNIT V  SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES  9
Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply Analog and digital communication techniques in estimating channel characteristics
- Design simple analog communication systems
- Analyze the characteristics of communication channels
- Simulate the random variables
- Estimate the communications channels
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To demonstrate the systematic way of solving problems using various data structures

LIST OF EXPERIMENTS
1. Implement singly linked lists.
2. Implement doubly linked lists.
3. Represent a polynomial as a linked list and write functions for polynomial addition.
4. Implement stack and use it to convert infix to postfix expression.
5. Implement a double-ended queue (dequeue) where insertion and deletion operations are possible at both the ends.
6. Implement an expression tree. Produce its pre-order, in-order, and post-order traversals.
7. Implement binary search tree.
8. Implement insertion in AVL trees.
9. Implement deletion in AVL trees.
10. Implement priority queue using binary heaps.
11. Implement hashing with open addressing.
12. Implement Prim's algorithm using priority queues to find MST of an undirected graph.

TOTAL: 45 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
- Develop programs using dynamic memory allocation and linked list ADT
- Develop programs for implementing various tree structures
- Make use of tree ADT
- Solve the issues in arranging the data with hashing
- Solve real world problems by finding minimum spanning tree and Shortest path algorithm

HARDWARE AND SOFTWARE REQUIREMENTS
Computer Required: 30 No's
Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB
Software Requirements:
- Operating System: Linux (Ubuntu/Fedora/Debian/Mint OS)/Windows
- TURBO C VERSION 3 Or GCC Version Unit III UNIT III/4 Built in linux /DEVC++
OBJECTIVES:
- To demonstrate the various features of Object Oriented Programming

LIST OF EXPERIMENTS
1. Write a C++ program using classes with primitive data members and objects.
2. Write a simple C++ program to create a class default arguments and necessary objects.
3. Write a C++ program to illustrate call by value, call by address, call by reference.
4. Write a C++ program to demonstrate the use of friend function.
5. Write a C++ program to implement virtual and inline functions.
6. Write a C++ program to create classes with constructor, destructor, copy constructor.
7. Write a C++ program to perform assignment operator overloading.
8. Write a C++ program to illustrate dynamic polymorphism.
9. Write a C++ program to create classes with hierarchical inheritance concepts.
10. Write a C++ program to perform sorting operation using templates.
11. Write a C++ program to implement a queue using exception handling.
12. Write a C++ program to perform operations on complex numbers using files as storage

TOTAL: 45 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
- Make use of object oriented programming concepts
- Construct programs using the applications of object oriented programming.
- Apply inheritance and polymorphism concepts.
- Develop code for overloading operators
- Analyze access issues using files

HARDWARE AND SOFTWARE REQUIREMENTS
Computer Required: 30 No”s
Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB
Software Requirements:
- Operating System: Linux (Ubuntu / Fedora / Debian / MintOS) / Windows
- Turbo C Version 3 or GCC Version Unit III UNIT III4 / Built in Linux / DEVC++
OBJECTIVES:
- To demonstrate the database design concepts for various real time applications

LIST OF EXPERIMENTS
1. Implement Data Definition Language (DDL) commands in RDBMS.
2. Implement Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. Implement High-Level Language extension with Cursors.
4. Implement High Level Language extension with Triggers
5. Implement Procedures and Functions.
6. Implement embedded SQL.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.
11. Design and implementation of Air Ticket Reservation System.

TOTAL: 45 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
- Apply the knowledge of DDL and DML in database design to solve the complex problems
- Apply the knowledge of integrity constraints on a databases
- Design a solution for PL/SQL queries using functions, cursors and Triggers
- Analyze the redundancy in database
- Function effectively as an individual and as a member for IT based products.

HARDWARE AND SOFTWARE REQUIREMENTS
Computer Required: 30 No’s
Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB
Software Requirements: Operating System: Linux (Ubuntu / Fedora / Debian / Mint OS)/Windows
Front End: VB/VC++/Java or Equivalent
Back End: Oracle / SQL / MySQL / PostGress / DB2 or Equivalent
OBJECTIVES:
- To inculcate the values of humanism, spirituality and to have an awareness of human rights
- To acquire knowledge and develop a sensitivity to the diversity of Indian culture

UNIT I VALUES AND SELF DEVELOPMENT
Concept of value- Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non moral valuation, Standards and principles - Need for inculcation of values in today's society- Sense of duty, Devotion, Self reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

UNIT II PERSONALITY AND BEHAVIOR DEVELOPMENT
Soul and scientific attitude, God and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Love and kindness, Avoiding fault finding, Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, True friendship, Happiness vs. suffering love for truth, Aware of self destructive habits, Association and cooperation, Doing best, Saving nature.

UNIT III CHARACTER AND COMPETENCE
Science vs. God, Holy books vs. blind faith, Self management and good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of women, All religions and same message, Mind your mind, Self control, Honesty, Studying effectively.

UNIT IV STRATEGIES FOR VALUE INCULCATION AND EVALUATION
Co-curricular Activities- Story – Telling- Discussion / Symposium- Drama- Role – play- Slogans and Quotations - Slides, filmsstrips, films- Games- Songs -The need for value evaluation-Tool and Techniques of value evaluation- Written tests technique Multiple choice, True and False, Fill in the blanks, Matching, Short answer-Tally of events Technique- Quiz technique- Photo language session- Checklist Technique- Art Computation Technique.

UNIT V HUMAN RIGHTS
Jurisprudence of human rights nature and definition, Universal protection of human rights, Regional protection of human rights, National level protection of human rights, Human rights and vulnerable groups

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to:
- Explain the social and personal values of life
- Describe the importance of human rights
- Analyze key issues related to values of life and human rights and propose appropriate solutions to the situations
TEXT BOOKS:

REFERENCE BOOKS:
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**Total No. of Credits - 27**
OBJECTIVES:
- To make the student acquire sound knowledge of standard distributions that can describe real life phenomena.
- To acquire skills in handling situations involving more than one random variable and functions of random variables.
- To provide the basic characteristic features of a queuing system and develop the skills in analyzing queuing models.

UNIT I PROBABILITY & STATISTICAL DISTRIBUTIONS 9 + 3
Axioms of probability - Conditional probability - Total probability - Baye”s theorem – Discrete and continuous random variables - Moments - Moment generating functions and their properties. Binomial, Poisson, Normal, Geometric, Uniform, Exponential and Gamma distributions.

UNIT II TWO DIMENSIONAL RANDOM VARIABLES 9 + 3
Joint distributions - Marginal and Conditional distributions – Covariance - Correlation and Regression - Transformation of random variables - Central limit theorem.

UNIT III DESIGN OF EXPERIMENTS 9 + 3
Completely Randomized Design – Randomized Block Design – Latin Square Design.

UNIT IV QUEUING THEORY 9 + 3
Markovian models – Birth and Death Queuing models - Steady state results: Single and multiple server queuing models - Little”s Formula - Queues with finite waiting rooms - Finite source models.

UNIT V NON-MARKOVIAN QUEUES AND QUEUE NETWORKS 9 + 3
M/G/1 Queue - Pollaczek- Khintchine formula. Series Queues - Open and Closed networks.

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Acquire knowledge of standard distributions and able to apply in real life phenomena.
- Find the relationship involving more than one random variables and able to analyze the problems.
- Design and analyze a process, to evaluate which process inputs have a significant impact on the process output using design of experiments.
- Study the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To introduce basic concepts of algorithms and classify various algorithmic techniques
- To review mathematical aspects and analysis of algorithms
- To summarize sorting, searching algorithms and report algorithm design methods

UNIT I BASIC CONCEPTS OF ALGORITHMS 9 + 3

UNIT II MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS 9 + 3

UNIT III ANALYSIS OF SORTING AND SEARCHING ALGORITHMS 9 + 3

UNIT IV ALGORITHMIC TECHNIQUES 9 + 3

UNIT V ALGORITHM DESIGN METHODS 9 + 3

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain the computational complexity of algorithms
- Apply the mathematical aspects to solve complex algorithms
- Analyze various searching and sorting techniques
- Apply algorithmic techniques in any simple real-time applications
- Analyses various Algorithmic design methods

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To explain the concepts of object-oriented programming paradigms.
- To impart knowledge in I/O packages of Java.
- To summarize the basic concepts of GUI programming.
- To review concurrent programming paradigms.

UNIT I  JAVA FUNDAMENTALS

UNIT II  INHERITANCE AND JAVA CLASSES

UNIT III  MULTI THREADING AND EXCEPTION HANDLING

UNIT IV  GUI

UNIT V  IO PACKAGES AND DATABASE CONNECTIVITY
Input Streams - Output Streams - Object Serialization - Deserialization - Filter and Pipe Streams - JDBC Architecture - Establishing Connectivity and Working With Connection Interface.

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Describe object oriented programs in Java
- Compare various inheritance mechanisms in java
- Explain multithreaded programming and exception handling in java
- Design GUI based applications using Java 2D and Swing components
- Discuss the connectivity with database using JDBC and work with I/O streams

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:

- To explain the tasks of Operating System such as Process management, Memory Management and I/O management
- To familiarize CPU and disk scheduling algorithms
- To introduce the concept of file system

UNIT I  PROCESSES AND THREADS  9

UNIT II  PROCESS SCHEDULING AND SYNCHRONIZATION  10

UNIT III  STORAGE MANAGEMENT  9

UNIT IV  FILE SYSTEMS  9

UNIT V  I/O SYSTEMS  8

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Classify the different types of operating system
- Apply the suitable algorithms for various problems related to process management
- Illustrate deadlock and memory management problems
- Analyze virtual memory and file sharing concepts
- Make use of file management concepts

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the fundamental concepts of requirements engineering and Analysis modelling
- To explain the phases of a software project life Cycle, testing and maintenance measures
- To review the major considerations for enterprise integration and deployment

UNIT I SOFTWARE PROCESS AND PROJECT MANAGEMENT 9

UNIT II REQUIREMENTS ANALYSIS AND SPECIFICATION 9

UNIT III SOFTWARE DESIGN 9

UNIT IV TESTING AND IMPLEMENTATION 9

UNIT V PROJECT MANAGEMENT 9

COURSE OUTCOMES:
At the end of the course, the student will be able to
- Demonstrate the current models, and techniques for the software lifecycle
- Identify the requirements needed for the solution to a software problem
- Apply appropriate software design and architecture for an application.
- Identify suitable testing techniques for software projects.
- Choose suitable project planning and risk management for software projects
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the different types of microprocessor architecture
- To present the multiprocessor configuration and architecture
- To provide the knowledge about microcontroller and the concepts of interfacing

UNIT I  THE 8085 AND 8086 MICROPROCESSORS  9
8085 Microprocessor architecture-Addressing modes- Instruction set-Programming the 8085.

UNIT II  8086 SOFTWARE ASPECTS  9

UNIT III  MULTIPROCESSOR CONFIGURATIONS  9
Coprocessor Configuration – Closely Coupled Configuration – Loosely Coupled Configuration –8087 Numeric Data Processor – Data Types – Architecture –8089 I/O Processor –Architecture – Communication between CPU and IOP.

UNIT IV  I/O INTERFACING  9

UNIT V  MICROCONTROLLERS  9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After successful completion of this course, the Students will be able to:
- Compare the 8085 and 8086 architecture and its programming
- Explain I/O interfacing
- Differentiate between closely coupled configuration and loosely coupled configuration
- Explain the 8087,8089 architecture and its application
- Describe the architecture of microcontroller and its interfacing concept for real time applications

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:
- To make the student acquire sound knowledge of the characteristic of quantitative and qualitative aptitude.
- To familiarize the student with various principles involved in solving mathematical problems.
- To develop an understanding of the basic concepts of reasoning skills.

UNIT I QUANTITATIVE APTITUDE

UNIT II NON VERBAL AND LOGICAL REASONING

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Solve the problems on commercial mathematics and correlation
- Interpret the graphical and numerical data

WEBSITES:
- www.tcyonline.com
- www.m4maths.com
- www.indiabix.com
- www.fresherworld.com
- www.careerbless.com

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:

- To demonstrate various features of JAVA

LIST OF EXPERIMENTS

1. Simple Java Programs.
2. Programs Using Arrays and Strings.
3. Programs to Demonstrate Static Data Members and Member Functions.
4. Programs on Interfaces.
5. Programs on Packages.
6. Programs Using Function Overloading.
7. Programs Using Inheritance, Function Overriding, and Constructors.
8. Programs Using I/O Streams.
9. Programs Using Files.
10. Programs Using Exception Handling.
11. Programs Using AWT.
12. Programs Using Swing.
13. Programs Using JDBC.

TOTAL: 45 PERIODS

COURSE OUTCOMES

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

- Create GUI applications Using Java Swing
- Design Database application with JDBC connectivity
- Apply exception handling mechanism in java
- Compare the method overloading and method overriding in java
- Write programs with file handling concepts in java

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware: Computers Required: 30 No"s.

Software:

1. Operating System: Ms-Windows 2000 / XP / NT or Linux
2. Java SE or Equivalent Edition.
4. MySql or Equivalent Database Product.
OBJECTIVES:

- To demonstrate operating system function calls, system calls and scheduling algorithm using UNIX operating system

LIST OF EXPERIMENTS

1. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir.
2. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
3. Write C programs to simulate UNIX commands like ls, grep, etc.
4. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions).
5. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions).
6. Develop an Application using Inter Process communication (using shared memory, pipes or message queues).
8. Implement deadlock detection and prevention algorithms.
9. Implement various memory management schemes (First, Best, Worst fit and Buddy schemes).
10. Implement various Page Replacement algorithms(FIFO, LRU)
11. Implement the file allocation techniques such as Linked, Indexed or Contiguous.
12. Implement various Disk Scheduling algorithms(FCFS, SSTF, SCAN, C-SCAN)

TOTAL: 45 PERIODS

COURSE OUTCOMES

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

- Demonstrate process management and control
- Demonstrate various CPU scheduling algorithms
- Solve problems involving semaphores
- Develop various applications involving memory management, File Management
- Make use of various disk scheduling algorithms

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware: Computers Required: 30 No”s.
Software:

1. Operating System: Ms-Windows 2000 / XP / NT or Linux
2. Java SE or Equivalent Edition.
4. MySql or equivalent Database Product.
OBJECTIVES:
- To introduce the basics of microprocessor and microcontroller programming, interfacing and their applications.

LIST OF EXPERIMENTS
1. Programs for 8/16 bit Arithmetic operations (Using 8085).
2. Programs for Sorting and Searching (Using 8085).
3. Interfacing ADC and DAC.
4. Parallel Communication between two MP Kits using Mode 1 and Mode 2 of 8255.
5. Serial Communication between two MP Kits using 8251.
6. Interfacing and Programming 8279, 8259, and 8253.
7. Programs for 16 bit Arithmetic operations (Using 8086).
8. Programs for Sorting and Searching (Using 8086).
10. Interfacing and Programming of Stepper Motor and DC Motor Speed control
11. Programs for Arithmetic, Logical and Bit manipulation (Using 8051).
12. Programming and verifying Timer, Interrupts and UART operations (Using 8051).
13. Communication between 8051 microcontroller kit and PC.
14. Traffic Light Control

TOTAL: 45 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
- Apply the knowledge of arithmetic and logical operation programs using 8085, 8086 and 8051 assembly language
- Analyze the communication between two microprocessor kits using parallel communication and serial communication
- Evaluate the communication protocols using 8255 and 8251 for 8085 and 8051
- Apply and Compile programs using 8086 simulator
- Interface the peripheral devices such as 8279, 8253 and 8259 with microprocessor

HARDWARE AND SOFTWARE REQUIREMENTS
1. 8085 Trainer Kit -15
2. 8086 Trainer Kit -15
3. 8051 Trainer Kit -15
4. 8255 Interfacing Card - 3
5. 8279 Interfacing Card - 3
6. 8251 Interfacing Card - 3
7. ADC Interfacing Card - 3
8. DAC Interfacing Card - 3
9. Stepper Motor Interfacing Card - 3
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OBJECTIVES:
- To make the student acquire sound knowledge to test the logic of program
- To familiarize the student to be aware of generating functions
- To develop an understanding of the concepts of graphs and Trees
- To acquaint the student with the concepts and properties of Lattices

UNIT I LOGIC AND PROOFS 9 + 3

UNIT II COMBINATORICS 9 + 3
Mathematical inductions - Strong induction and well ordering - The basics of counting – The pigeonhole Principle – Permutations and Combinations - Recurrence relations – Solving Linear recurrence relations - Generating functions - Inclusion and exclusion and applications.

UNIT III GRAPHS 9 + 3
Graphs and graph models - Graph terminology and special types of graphs – Representing graphs and graph isomorphism – Connectivity - Euler and Hamilton paths - Trees, Spanning Trees (Definitions and properties only).

UNIT IV ALGEBRAIC STRUCTURES 9 + 3
Algebraic systems - Semi groups and Monoids – Groups - Subgroups and Homomorphisms - Cosets and Lagrange’s theorem - Ring & Fields (Definitions and examples).

UNIT V LATTICES AND BOOLEAN ALGEBRA 9 + 3

TOTAL: 45 (L) + 15 (T) = 60 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Prove implication problems using truth table method, replacement process, analyzation method, truth table technique and rules of inference
- Use the basic of country in Pigeon hole principle find the solution for the given problem.
- Verify whether the given graph are isomorphic or not, Verify whether the given is ring (field) or not.
- Check the properties of Euler Hamiltonian graphs and also spanning trees.
- Write down the properties of Lattices sublattices and special type of lattices also.
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the functions of different layers
- To familiarize the network topologies and protocols
- To explain IEEE standard employed in computer networking

UNIT I  PHYSICAL LAYER
Network architecture – layers – Physical links – Channel access on links – Hybrid multiple access techniques - Issues in the data link layer - Framing – Error correction and detection – Link-level Flow Control

UNIT II  DATALINK LAYER
Medium access – CSMA – Ethernet – Token ring – FDDI - Wireless LAN – Bridges and Switches

UNIT III  NETWORK LAYER

UNIT IV  TRANSPORT LAYER

UNIT V  APPLICATION LAYER

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the knowledge of various Physical Layers components
- Identify, formulate and analyze various link layer and physical layer protocols
- Identify the networks and analyze the flow of information between the nodes
- Apply the Knowledge of Transport layer to improve QoS in networks
- Apply the knowledge of various Application Layer protocols

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To impart the knowledge of OOAD and system design using UML diagrams.
- To explain the fundamental design patterns for object-oriented analysis.
- To discuss how to apply state modeling to business entity classes and graphical notation for UML diagrams.
- To demonstrate about Mapping design to code and Testing.

UNIT I  UML DIAGRAMS

UNIT II  DESIGN PATTERNS

UNIT III  CASE STUDY
Case study – the Next Gen POS system, Inception -Use case Modeling - Relating Use cases – include, extend and generalization - Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class Hierarchies - Aggregation and Composition.

UNIT IV  APPLYING DESIGN PATTERNS
System sequence diagrams - Relationship between sequence diagrams and use cases Logical architecture and UML package diagram – Logical architecture refinement - UML class diagrams – UML interaction diagrams - Applying GoF design patterns.

UNIT V  CODING AND TESTING

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain fundamental concepts of object-oriented analysis and design.
- Apply system development design patterns and UML graphical notations.
- Describe different Use cases and conceptual class hierarchies.
- Prepare different UML diagrams based on use case narrative.
- Compare and contrast various testing techniques.

TEXT BOOKS:
REFERENCE BOOKS:

2. Erich Gamma, a n d Richard Helm, Ralph Johnson, John Vlissides, “Design patterns: Elements of Reusable Object-Oriented Software”, Addison-Wesley, 1995.
OBJECTIVES:
- To explain the basic structure of embedded system
- To familiarize with modern hardware/software tools for building prototypes of embedded systems
- To summarize the current statistics of embedded systems

UNIT I
INTRODUCTION TO EMBEDDED COMPUTING AND ARM PROCESSORS
Complex systems and microprocessors– Embedded system design process –Design example: Model train controller- Instruction sets preliminaries - ARM Processor – CPU: programming input and output supervisor mode, exceptions and traps – Co-processors- Memory system mechanisms – CPU

UNIT II
EMBEDDED COMPUTING PLATFORM DESIGN
The CPU Bus-Memory devices and systems–Designing with computing platforms – consumer electronics architecture – platform-level performance analysis - Components for embedded programs- Models of programs- Assembly, linking and loading – compilation techniques- Program level performance analysis – Software performance optimization – Program level energy and power analysis and optimization – Analysis and optimization of program size- Program validation and testing.

UNIT III
PROCESSES AND OPERATING SYSTEMS
Introduction – Multiple tasks and multiple processes – Multirate systems- Preemptive real-time operating systems- Priority based scheduling- Interprocess communication mechanisms – Evaluating Operating system performance- power optimization strategies for processes – Example Real time operating systems-POSIX-Windows CE.

UNIT IV
SYSTEM DESIGN TECHNIQUES AND NETWORKS
Design methodologies- Design flows - Requirement Analysis – Specifications-System analysis and architecture design – Quality Assurance techniques- Distributed embedded systems – MPSoCs and shared memory multiprocessors.

UNIT V
CASE STUDY
Data compressor - Alarm Clock - Audio player - Software modem-Digital still camera – Telephone answering machine-Engine control unit – Video accelerator.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
Upon completion of the course, students will be able to:
- Explain architecture and programming of ARM processor
- Analyze the performance characteristics of embedded systems
- Explain the basic concepts of real time Operating system design
- Apply the system design techniques to develop software for embedded systems
- Apply embedded systems to solve real world problems
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the concepts and techniques used in two-dimensional and tree-dimensional computer graphics
- To familiarize with the algorithms and models for geometric projections, transformations, texture mapping, shading and lighting
- To review graphics programming with OpenGL

UNIT I  2D PRIMITIVES
Output primitives – Line, Circle and Ellipse drawing algorithms - Attributes of output primitives– Two dimensional Geometric transformation - Two dimensional viewing – Line, Polygon, Curve and Text clipping algorithms

UNIT II  3D CONCEPTS
Parallel and Perspective projections - Three dimensional object representation – Polygons, Curved lines, Splines, Quadric Surfaces, - Visualization of data sets - 3D transformations – Viewing -Visible surface identification.

UNIT III  GRAPHICS PROGRAMMING

UNIT IV  RENDERING

UNIT V  FRACTALS

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply various algorithms for 2D primitives, geometric transformations and clipping
- Explain the 3D Object representation, transformations and viewing concepts
- Construct 2D & 3D graphics with OpenGL.
- Make use of rendering techniques to naturalize the scene
- Develop graphics application using animations

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To familiarize with the wireless/mobile market and the future needs and challenges.
- To import mathematical models of radio wave propagation.
- To review the mobile/wireless communication systems.

UNIT I INTRODUCTION TO WIRELESS COMMUNICATION

UNIT II MOBILE RADIO WAVE PROPAGATION (LARGE SCALE FADEING)

UNIT III MOBILE RADIO WAVE PROPAGATION (SMALL SCALE FADEING &MULTIPATH)

UNIT IV CAPACITY, DIVERSITY AND EQUALIZATION IN WIRELESS SYSTEM

UNIT V WIRELESS SYSTEMS AND STANDARDS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Acquire the knowledge in the working principles wireless architectures
- Analyze the various mobile propagation schemes
- Demonstrate knowledge in diversity reception techniques
- Compare various wireless communication standards
- Design a cellular system
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To demonstrate the various Networking Protocols

LIST OF EXPERIMENTS
1. Implementation of Data Encryption and Decryption
2. Implementation of CRC
3. Implementation of Domain Name System
4. Implementation of sliding window protocol
5. Implementation of Stop and Wait protocol
6. Implementation of Distance Vector Routing protocol
7. Configure Network using Link State Vector Routing protocol
8. Write a program for Hamming Code generation for error detection and correction.
9. Implementation of ARP/RARP
10. Programs using TCP Sockets (like date and time server & client, echo server & client, etc.)
11. Programs using UDP Sockets (like simple DNS)
12. Study of Glomosim / OPNET

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of data Encryption and Decryption
- Identify Formulate Analyze the functionality of protocols
- Apply the Knowledge of basic functionality of protocols
- Identify and analyze the Error correction and detection to improve the QoS
- Identify the issues and analyze the outcome of the issues by Applying the knowledge of OPNET

HARDWARE AND SOFTWARE REQUIREMENTS
PCs, C++ Compiler, J2SDK (Freeware), Network simulators, NS2/Glomosim/OPNET (Freeware)
OBJECTIVES:
- To introduce the basics of OO analysis and design skills and familiarize with UML design diagrams.

LIST OF EXPERIMENTS
To develop a mini-project for the following exercises listed below.
1. To develop a problem statement.
2. Identify Use Cases and develop the Use Case model.
3. Identify the conceptual classes and develop a domain model with UML Class diagram.
4. Using the identified scenarios, find the interaction between objects and represent them using UML Sequence diagrams.
5. Draw relevant state charts and activity diagrams.
6. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
7. Develop and test the Technical services layer.
8. Develop and test the Domain objects layer.
9. Develop and test the User interface layer.

SUGGESTED DOMAINS FOR MINI-PROJECT:
1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing
9. E-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System
14. Library Management System
15. Student Information System

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Design the projects using OO concepts.
- Use the UML analysis and design models
- Use the UML graphical notations for the appropriate diagrams
- Apply appropriate design patterns
- Convert design into code

TOTAL: 45 PERIODS
HARDWARE AND SOFTWARE REQUIREMENTS
Hardware: Standalone desktops 30 Nos
Software: Rational Suite, Open Source Alternatives: ArgoUML, Visual Paradigm, Eclipse IDE and JUnit
OBJECTIVES:
- To demonstrate the 2D, 3D and geometric transformation using OpenGL

LIST OF EXPERIMENTS
1. Implementation of Bresenham’s Algorithm – Line, Circle, Ellipse.
2. Implementation of Line, Circle and ellipse attributes.
3. Two Dimensional transformations - Translation, Rotation, Scaling, Reflection, Shear.
5. Cohen Sutherland 2D line clipping and Windowing
7. Three dimensional transformations - Translation, Rotation, Scaling.
8. Composite 3D transformations.
9. Implement a color models using OpenGL.
10. Projection of the 3D image using OpenGL.
11. Draw three dimensional object & scenes using OpenGL.
12. Draw at least four basic graphics primitives using OpenGL.
13. Generating Fractal images using OpenGL.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Develop applications for geometric transformation.
- Construct graphical functions using graphics primitives.
- Compare 2D & 3D transformations
- Apply different aspects of color in computer graphics.
- Develop an animation application using OpenGL

HARDWARE AND SOFTWARE REQUIREMENTS
Minimum Hardware Requirements: (for a batch of 30 students)
Intel Pentium III 800 MHz Processor or higher version, Intel chipset 810 mother board or higher version, 14” color monitor or greater than that Mouse, Keyboard, 2GB HDD or greater, 256 MB RAM or greater
Software Requirements: Turbo C / C++ compiler that supports graphics.h package.
    Special DOSBOXed installer for Turbo C++ compiler
OBJECTIVES:

- To develop a requisite knowledge in soft skills and communication skills.
- To understand long texts and be able to orally summarize complex reports, commentaries and correspondence with the occasional use of a dictionary, and extract ideas and opinions.

UNIT I COMMUNICATION SKILL

Listening to the Conversation - Introducing oneself before audience - Group Discussion - Formal Letter writing – E-Mail Etiquettes - Power Point Presentation

UNIT II PREPARATION FOR INTERVIEWS

Preparation of Resume - Difference between Bio-data and CV - Visiting Company Web site - Gathering Information about Company - Mode of Selection - Different types of Selection Methods – Pre-placement Talk - Attitude before Interview

UNIT III INTERVIEW SKILL

Body Language - Types of Interview - Attending Telephonic Interview – Do’s and Don’ts during and after the Interview - Expectation of the Interviewer - Mock Interview.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Explain the social and personal values of life
- Describe the importance of human rights
- Analyze key issues related to values of life and human rights and propose appropriate solutions to the situations

REFERENCE BOOKS:

1. Dr. K.Alex, Soft Skills, know yourself and know the world, Second Revised Edition 2011, S Chand Publication New Delhi-110055

HARDWARE AND SOFTWARE REQUIREMENTS

Software: Globarena and CDs Generated by the Department of English
Hardware: 60 Systems & LCD Projector with Speakers
SEMESTER VI
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Total No. of Credits - 25
OBJECTIVES:
- To introduce the service oriented analysis techniques
- To import the technology underlying the service design
- To demonstrate the SOA platforms and WS specification standards

UNIT I INTRODUCTION

UNIT II WEB SERVICES
Web services – Service descriptions – Messaging with SOAP –Message exchange Patterns – Coordination –Atomic Transactions – Business activities – Orchestration –Choreography - Service layer abstraction – Application Service Layer – Business Service Layer – Orchestration Service Layer

UNIT III COMMUNICATION AND SOA

UNIT IV SOA PLATFORMS
SOA platform basics – SOA support in J2EE – Java API for XML-based web services (JAX-WS) - Java architecture for XML binding (JAXB) – Java API for XML Registries (JAXR) - Java API for XML based RPC (JAX-RPC) - Web Services Interoperability Technologies (WSIT) - SOA support in .NET – Common Language Runtime - ASP.NET web forms – ASP.NET web services – Web Services Enhancements (WSE)

UNIT V WS SPECIFICATION STANDARDS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Explain the client server and distributed architecture
- Analyze the significance of service orientation architecture and web services
- Make use of Communication techniques for an appropriate service
- Select the suitable SOA platform for an application
- Create the WS specification standards for an applications
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the phases of operation of a compiler
- To familiarize the design and implementation of a lexical analyzer and parser
- To demonstrate the code generation and optimization

UNIT I  LEXICAL ANALYSIS  9
Introduction to Compiling- Compilers-Analysis of the source program-The phases- Cousins- The grouping of phases- Compiler construction tools. The role of the lexical analyzer- Input buffering-Specification of tokens- Recognition of tokens-A language for specifying lexical analyzer.

UNIT II  SYNTAX ANALYSIS and RUN-TIME ENVIRONMENTS  9
Syntax Analysis- The role of the parser- Context-free grammars-Writing a grammar - Topdown parsing-Bottom-up Parsing-LR parsers- Constructing an SLR(1) parsing table. Type Checking- Type Systems-Specification of a simple type checker. Run-Time Environments- Source language issues- Storage organization- Storage allocation strategies.

UNIT III  INTERMEDIATE CODE GENERATION  9
Intermediate languages- Declarations- Assignment statements - Boolean expressions- Case statements- Backpatching- Procedure calls

UNIT IV  CODE GENERATION  9
Issues in the design of a code generator- The target machine- Run-time storage management- Basic blocks and flow graphs- Next-use information- A simple code generator- Register allocation and assignment- The DAG representation of basic blocks - Generating code from DAG.

UNIT V  CODE OPTIMIZATION  9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of lexical analysis phase to solve the problem of tokenization of a sequence of characters
- Apply the knowledge of parsers to solve syntax analysis phase of programming statements
- Analyze intermediate code generation and formulate intermediate codes for the output of syntax analyzer
- Identify and analyze the issues of code generation using the principles of register allocation and assignment
- Apply various techniques on generated intermediate codes to solve the problem of code optimization
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the essentials of web and markup languages
- To import the HTML & XHTML elements and the basics of client server programming
- To summarize the Document Object Model, XML and C# & .NET framework

UNIT I  INTRODUCTION  9

UNIT II CSS AND CLIENT SIDE PROGRAMMING  9

UNIT III CLIENT SIDE PROGRAMMING & DOM  9

UNIT IV XML AND JSP  9

UNIT V .NET FRAMEWORK  9

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Design and develop web pages using HTML and DHTML
- Interpret the role of Cascading Style Sheets and Scripting in web applications
- Compare and contrast server side technologies
- Infer the knowledge of MVC architecture supported by different frameworks
- Build web based applications for the enterprises

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To familiarize the symmetric and asymmetric encryption algorithms
- To explain the authentication and Hash functions for improved security
- To review the network security applications such as firewalls, IDS and trusted systems

UNIT I  INTRODUCTION TO CRYPTOGRAPHY
Security trends – Attacks and services – Classical crypto systems – Different types of ciphers –
Basic Number theory – Groups, Rings, Fields – Modular Arithmetic –Euclidean Algorithm- Finite
Fields of the form GF (p), Polynomial Arithmetic-Finite fields of the form GF(2 ^n) –Prime Numbers -
Fermat and Euler’s theorem.

UNIT II  SYMMETRIC CIPHERS
Modes of operation – Triple DES – AES – RC4

UNIT III  HASH FUNCTIONS AND PUBLIC KEY CRYPTOGRAPHY
Discrete Logarithms – Computing discrete logs – RSA – Attacks -Diffie-Hellman key exchange –
ElGamal Public key cryptosystems – Hash functions – Secure Hash – Birthday attacks - MD5 –
Digital signatures – RSA – ElGamal – DSA

UNIT IV  AUTHENTICATION APPLICATIONS

UNIT V  SYSTEM SECURITY
Standards.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of mathematical concepts to cryptography
- Analyze the Strength of symmetric cipher algorithm
- Apply Public Key Cryptography and Make use of Hash Functions in cryptography techniques
- Select an appropriate techniques for Authentication applications
- Analyze the Network security design using available secure solutions

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:

- To demonstrate SOA applications Using .NET Framework

LIST OF EXPERIMENTS

1. Develop a program to implement invoice Order Processing using .NET component
2. Develop a program to implement Payment processing using .NET component
3. Develop a program to implement invoice Order Processing using EJB component
4. Develop a program to implement Payment processing using EJB component
5. Develop a program for implement calculator and to calculate simple and complex interest using .NET
6. Develop a program for calculate Library management processing using EJB component
7. Develop a program for calculate Library management processing using .NET component
8. Invoke .NET components as web services.
9. Invoke EJB components as web services.
10. Develop a Service Orchestration Engine (workflow) using WS-BPEL and implement service composition. For example, a business process for planning business travels will invoke several services. This process will invoke several airline companies (such as Air India, Indian Railways etc.) to check the airfare price and buy at the lowest price.
11. Develop a J2EE client to access a .NET web service.
12. Develop a .NET client to access a J2EE web service.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Develop programs using service oriented analysis and design
- Apply component based model in service oriented architecture
- Develop a service orchestration Engine using WS-BPEL
- Design an application using .NET and J2EE web service
- Apply WS-BPEL services in service orchestration Engine

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware: CPU: (As Server) Processor (Core 2 Quad or equivalent) with good speed, 2GBRAM, 300GBHDD.
OBJECTIVES:
- To demonstrate web services and Web pages Using DHTML and Scripting Languages

LIST OF EXPERIMENTS
1. To create a simple HTML file to demonstrate the use of different tags (frames, links, tables etc)
2. To create a web page with the following using HTML
   i. To embed an image map in a web page
   ii. To fix the hot spots
   iii. Show all the related information when the hot spots are clicked
3. To create a web page with all types of Cascading style sheets
4. To create a scientific calculator using JavaScript
5. To create a Client Side Scripts for Validating Web Form Controls using DHTML
6. Write programs in Java to create applets incorporating the following features:
   i. Create a color palette with matrix of buttons
   ii. Set background and foreground of the control text area by selecting a color from color palette.
   iii. In order to select Foreground or background use check box control as radio buttons
   iv. To set background images
7. Write programs in Java using Servlets:
   i. To invoke servlets from HTML forms
   ii. To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using JSP and Databases
9. Write Programs using XML – Schema – XSLT/XSL
10. Programs using AJAX
11. Write Programs using C# and .NET
12. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Design and develop web pages using HTML, DHTML and Cascading Style Sheets
- Demonstrate the creation of interactive web pages
- Adapt client side and server side scripting
- Write XML schema for an application
- Build web based systems for the enterprises using technology like JSP, Servlet, C# and ASP.NET

HARDWARE AND SOFTWARE REQUIREMENTS
Hardware: Standalone Desktops – 30 Nos
Software: Java, Dream Weaver or Equivalent, MySQL or Equivalent, Apache Server
OBJECTIVES

- To demonstrate the Network Security Concepts with different Algorithms and Techniques

LIST OF EXPERIMENTS

1. Study of TCP and UDP Sockets
2. Study of TCP/UDP performance
3. Implement the following SUBSTITUTION & TRANSPOSITION TECHNIQUES concepts:
   a) CaesarCipher
   b) PlayfairCipher
   c) Hill Cipher
   d) Vigenere Cipher
   e) Rail fence–row & Column Transformation
4. Implement the following algorithms
   a) DES
   b) RSA Algorithm
   c) Diffie-Hellman
   d) MD5
   e) SHA-1
5. Implement the SIGNATURE SCHEME-Digital Signature Standard
6. Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG).
7. Set up a honeypot and monitor the honeypot on network (KF Sensor)
8. Installation of rootkits and study about the variety of options
9. Perform wireless audit on an access point or a router and decrypt WEP and WPA (NetStumbler)
10. Demonstrate intrusion detection system (ids) using any tool (snort or any other s/w)
11. Performance comparison of MAC protocols
12. Performance comparison of routing protocols

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of the course students will be able to

- Apply the classical cipher techniques for Network Security
- Develop various symmetric and asymmetric security algorithms
- Identify the different open source tools for network security analysis
- Analyze the network security designs using available secure solutions
- Analyze the Performance of Network Security Protocols

HARDWARE AND SOFTWARE REQUIRMENTS

Hardware: Standalone desktops -30 Nos. OR Server supporting 30 terminals or more.
Software: C / C++ / Java or equivalent compiler, GnuPG, KF Sensor or Equivalent, Snort, Net Stumbler or Equivalent, Opnet.
OBJECTIVES

- To engage the student in integrated activities of reading, research, discussion and presentation around a designated subject

This course is introduced to enrich the communication skills of the student and to create awareness on recent development in Electronic and Instrumentation through Technical presentation. In this course, a student has to present at least two Technical papers or recent advances in engineering/technology that will be evaluated by a committee constituted by the Head of the Department.

COURSE OUTCOMES

After successful completion of this course the students will be able to:
- Identify and formulate a technical problem to reach substantiated conclusion using basic technical knowledge
- Design or Develop prototype model for societal needs applying the basic engineering knowledge
- Evaluate the performance of the developed solution using appropriate techniques and tools
- Apply management principles to function as a team
- Communicate the technical information effectively
SEMESTER VII
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**Total No. of Credits - 22**
OBJECTIVES:
- To impart knowledge to find solutions and approaches for various projects.
- To familiarize the utilization of project within time, resource and financial constraints.

UNIT I  PROJECT MANAGEMENT CONCEPTS
Concept and characteristics of a project, importance of project management, types of project, project organizational structure, project life cycle, Statement of Work, Work Breakdown Structure.

UNIT II  PROJECT PLANNING
Project Planning and Scheduling techniques - developing the project network USING CPM/PERT, constructing network diagram, AON basics, Forward Pass and backward pass, Limitations of CPM/PERT, Precedence Diagramming Method, constructing diagram and computations using precedence diagramming method, PERT/CPM simulation, reducing project duration.

UNIT III  RESOURCE SCHEDULING & CRITICAL CHAIN SCHEDULING
Resource Scheduling - Resource allocation method, splitting and multitasking, Multi project resources scheduling - Critical Chain Scheduling - Concept of critical chain scheduling - critical chain scheduling method, application of Critical chain scheduling and limitations.

UNIT IV  PROJECT QUALITY MANAGEMENT
Concept of project quality, responsibility for quality in projects, quality management at different stages of project, tools and techniques, Quality Management Systems, TQM in projects - Project performance Measurement and Control - Monitor and assess project performance, schedule, and cost. Earned value Management, performance measurement. methods to monitor, evaluate, and control planned cost and schedule performance - Project Closure/ Termination - Meaning of closure/ termination, project audit process, termination steps, final closure.

UNIT V  FINANCIAL ACCOUNTING

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Discuss various characteristics and importance of project management.
- Use CPM/PERT network for finding minimum project duration.
- Compare various scheduling methods.
- Justify various tools and techniques at different stages of quality management.
- Discuss financial ratios, cash flow and fund flow analysis.

TEXT BOOKS:

REFERENCE BOOKS:
2. John M Nicholas, “Project Management For Business And Technology”, Prentice Hall Of India Pvt Ltd.
OBJECTIVES:
- To import the needs of different databases
- To introduce the transaction management of the database
- To be familiarize in web, intelligent and real time database

UNIT I  PARALLEL DATABASES  9

UNIT II  OBJECT ORIENTED DATABASES  9

UNIT III  WEB DATABASES  9

UNIT IV  INTELLIGENT DATABASES  9

UNIT V  CURRENT TRENDS  9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Choose the appropriate database system architecture
- Develop an application using OODBMS
- Make use of web technology to construct a web database
- Explain the enhanced Data Models for Intelligent database
- Analyze the current trend in databases
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce various wireless voice and data communications technologies
- To be familiarize with the working principles of wireless LAN and its standards
- To demonstrate and develop skills in working with Wireless application Protocols

UNIT I  WIRELESS COMMUNICATION  8
Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation -MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks

UNIT II  WIRELESS NETWORKS  9
Wireless LAN – IEEE 802.11 Standards – Architecture – Services – Mobile Ad hoc Networks- WiFi and WiMAX - Wireless Local Loop

UNIT III  MOBILE COMMUNICATION SYSTEMS  10

UNIT IV  MOBILE NETWORK AND TRANSPORT LAYERS  9

UNIT V  APPLICATION LAYER  9
WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile- caching model-wireless bearers for WAP - WML – WML Scripts - WTA - iMode- SyncML

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Explain different multiple access techniques
- Compare the various wireless local networks
- Make use of the protocol and system architecture of GSM and GPRS for real world application
- Categorize various TCP Mechanism for mobile networks
- Analyze the various protocols under the architecture of Wireless Application Protocol
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To import the knowledge in ATM and frame relay
- To explain the techniques involved to support real-time traffic and congestion control
- To summarize the different levels of quality of service to various applications

UNIT I  HIGH SPEED NETWORKS  9

UNIT II  CONGESTION AND TRAFFIC MANAGEMENT  9

UNIT III  TCP AND ATM CONGESTION CONTROL  9

UNIT IV  INTEGRATED AND DIFFERENTIATED SERVICES  9
Integrated Services Architecture-Approach, Components, Services-Queueing Discipline, FQ,PS, BRFQ,GPS,WFQ-Random Early Detection, Differentiated Services

UNIT V  PROTOCOLS FOR QOS SUPPORT  9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Classify various aspects of High Speed Networks
- Analyze the effect of congestion control and traffic
- Explain the performance of TCP and ATM Congestion Control
- Make use of various integrated and differentiated services
- Compare different levels of QOS and supporting protocols

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To demonstrate and develop the Mobile Application using various Tools and Techniques

LIST OF EXPERIMENTS
1. Write a program to build an Android Application
   a) Display Hello World
   b) Implement Sub Menu
   c) Implement Context menu (Floating List of Menu Items)
2. Write a program to display the views of different attributes.
   a) Relative Layout Views
   b) Linear Layout Views
3. Write a program to implement a menu which uses check-able items in Menu.
4. Write a program to implement a Custom Button and handle the displayed message on button press.
5. Write a program to implement the Table layout in View Group that displays child View elements in rows and columns.
6. Write a program to implement tween animation and rotate the text in your android application.
7. Write a program to show how to use Date picker control of ADK in your android applications.
8. Write a program which enables you to draw an image using bitmap class object.
9. Write a program which allows you to get image from web and displayed them using the Image view.
10. Write a program which shows you how to create a scroll view when text is not visible on one page.
11. Write a program which will shows you how to run any video file.
12. Create an Android application for the following.
    a) Body Mass Index (BMI)
    b) Currency Converter
    c) Suduko Game

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of various layouts to build an Android Application
- Select and apply appropriate menu and controls buttons
- Apply the knowledge of animation to build an Android Application
- Create, Select and Apply the appropriate Knowledge of ADK in your android Application
- Identify, formulate and analyze the robust & scalable features of your Android applications

HARDWARE AND SOFTWARE REQUIREMENTS
Standalone desktops with Windows or Android or iOS or Equivalent Mobile Application Development Tools with appropriate emulators and debuggers - 30 Nos.
OBJECTIVES:
- To demonstrate and design an efficient database for various applications

LIST OF EXPERIMENTS:

DISTRIBUTED DATABASE
Consider a distributed database for a bookstore with 4 sites called S1, S2, S3 and S4. Consider the following relations:
Books (ISBN, primary Author, topic, total Stock, price)
Book Store (store No, city, state, zip, inventory Value)
Stock (store No, ISBN, Qty)
Total Stock is the total number of books in stock and inventory Value is the total inventory value for the store in dollars.
1. Consider that Books are fragmented by price amounts into:
   F1: Books: price up to $20
   F2: Books: price from $20.01 to $50
   F3: Books: price from $50.01 to $100
   F4: Books: price $100.01 and above
   Write SQL query for the following
   i. Insert and Display details in each table.
   ii. Find the total number of books in stock where price is between $15 and $55.

2. Consider that Book Stores are divided by ZIP codes into:
   S1: Bookstore: Zip up to 25000
   S2: Bookstore: Zip 25001 to 50000
   S3: Bookstore: Zip 50001 to 75000
   S4: Bookstore: Zip 75001 to 99999
   Write SQL query for the following
   i. Update the book price of book No=1234 from $45 to $55 at site S3.
   ii. Find total number of book at site S2.

OBJECT ORIENTED DATABASE
A University wants to track persons associated with them. A person can be an Employee or Student. Employees are Faculty, Technicians and Project associates. Students are Full time students, Part time students and Teaching Assistants.

3. Design an Enhanced Entity Relationship (EER) Model for university database. Write OQL for the following
   i. Insert details in each object.
   ii. Display the Employee details.

4. Design an Enhanced Entity Relationship (EER) Model for university database. Write OQL for the following
   i. Display Student Details.
ii. Modify person details.
iii. Delete person details.

PARALLEL DATABASE
5. Consider the application for University Counseling for Engineering Colleges. The college, department and vacancy details are maintained in 3 sites. Students are allocated colleges in these 3 sites simultaneously. Implement this application using parallel database [State any assumptions you have made].
6. There are 5 processors working in a parallel environment and producing output. The output record contains college details and students mark information. Implement parallel join and parallel sort algorithms to get the marks from different colleges of the university and publish 10 ranks for each discipline.

XML
Design XML Schema for the given company database  
Department (deptName, deptNo, deptManagerSSN, deptManagerStartDate, deptLocation )  
Employee (empName, empSSN, empSex, empSalary, empBirthDate, empDeptNo, empSupervisorSSN, empAddress, empWorksOn)  
Project ( projName, projNo, projLocation, projDeptNo, projWorker )

7. Implement the following queries using XQuery and XPath
   i. Retrieve the department name, manager name, and manager salary for every department.
   ii. Retrieve the employee name, supervisor name and employee salary for each employee who works in the Research Department.
   iii. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project.
   iv. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project with more than one employee working on it.

8. Implement a storage structure for storing XML database and test with the above schema.
9. Create applications using Triggers.
11. Develop an application using mobile database.

WEKA TOOL
12. Work with Weka tool classification and clustering algorithms using the given training data and test with the unknown sample. Also experiment with different scenarios and large data set.

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COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the concepts of distributed and object oriented databases
- Make use of the features of parallel database
- Apply the clustering and classification using weka tool
- Develop application using XML and work on it
- Apply query evaluation and optimization techniques

HARDWARE AND SOFTWARE REQUIREMENTS
Computer Required: 30 No’s
Minimum Requirement: Processor: Pentium IV, Ram: 1 GB, Hard Disk: 80 GB
Software Requirements:
Operating System: Linux (Ubuntu/Fedora / Debian / Mint OS) /
Windows Turbo C Version 3 or GCC Version Unit III UNIT III4/ Built in Linux /DEV C++ Front End: NetBeans Back End: Oracle 9i/ PL SQL / Hadoop / Weka
SEMESTER VIII
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**Total No. of Credits - 12**
OBJECTIVE

- To deepen comprehension of principles by applying them to a new problem which may be the 
design and manufacture of a device, a research investigation, a computer based project or 
management project.

PROJECT DESCRIPTION :
Six periods per week shall be allotted in the time table and this time shall be utilized by the students 
to receive the directions from the guide, on library reading, laboratory work, computer analysis or 
field work as assigned by the guide and also to present in periodical seminars on the progress made 
in the project. The progress of the project is evaluated based on a minimum of three reviews.

COURSE OUTCOMES

- Design/Develop sustainable solutions for societal issues with environmental considerations 
applying the basic engineering knowledge
- Analyze and review research literature to synthesize research methods including design of 
experiments to provide valid conclusion
- Utilize the new tools, algorithms, techniques to provide valid conclusion following the norms of 
engineering practice
- Test and Evaluate the performance of the developed solution using appropriate techniques and 
tools
- Apply management principles to function effectively in the project team for project execution
- Engage in learning for effective project implementation in the broadest context of technological 
change with consideration for public health, safety, cultural and societal needs
- Write effective reports and make clear presentation to the engineering community and society
ELECTIVES
### LIST OF ELECTIVES

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**Note:** Student may choose any one of the electives offered by the other branch of study.
OBJECTIVES:
- To explain the hardware and software features that support distributed OS
- To import a broader sense of knowledge in multi-threading operating system and memory concepts
- To demonstrate some insight in to the design of ATM networks and client server model

UNIT I     INTRODUCTION TO DISTRIBUTED SYSTEMS     9
Distributed system goals, Hardware Concepts, Software concepts, design issues, Case study: Unix

UNIT II    COMMUNICATION IN DISTRIBUTED SYSTEMS     9
Layered Protocol, ATM Networks, client server model - remote procedure call – group communication, Case study: SUN RPC, DCE, RPC.

UNIT III   SYNCHRONIZATION                           9
Clock synchronization - mutual exclusion - election atomic transactions - dead locks, Case study: CHORUS

UNIT IV    PROCESS AND PROCESSORS DISTRIBUTED FILE SYSTEMS   9
Threads - System models processor allocation - scheduling fault tolerance - real time distributed systems. File system design and implementation - trends in distributed file systems

UNIT V     SHARED MEMORY                             9
Introduction - bus based multi processors, ring based multiprocessors ,switched multiprocessors - NUMA comparison of shared memory systems - consistency models - page based distributed shared memory - shared variable distributed shared memory - object based distributed shared memory

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Explain the issues in designing distributed operating systems.
- Discuss various networking and communication technologies
- List the synchronization problems in distributed systems
- Implement the real time shared memory systems.

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:
- To introduce the basic concepts of artificial intelligence
- To explain various knowledge representation techniques.
- To import the various knowledge inference, machine learning approaches and problem solving techniques

UNIT I  INTRODUCTION TO AI AND PRODUCTION SYSTEMS  9
Introduction to AI-Problem formulation, Problem Definition - Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics - Specialized production system- Problem solving methods - Problem graphs, Matching, Indexing and Heuristic functions - Hill Climbing - Depth first and Breath first, Constraints satisfaction - Related algorithms, Measure of performance and analysis of search algorithms.

UNIT II  REPRESENTATION OF KNOWLEDGE  9
Game playing - Knowledge representation, Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic- Structured representation of knowledge.

UNIT III  KNOWLEDGE INFERENCE  9
Knowledge representation - Production based system, Frame based system. Inference - Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning - Certainty factors, Bayesian Theory - Bayesian Network - Dempster - Shafer theory.

UNIT IV  PLANNING AND MACHINE LEARNING  9

UNIT V  COMMUNICATION, PERCEPTION AND ACTION  9

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Identify problems that are amenable to solution by AI methods
- Apply predicate logic for knowledge representation
- Identify appropriate AI methods to solve a given problem
- Design and carry out an empirical evaluation of different AI algorithms

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To explain the requirements of software architectures
- To describe various architectural styles and views
- To introduce the quality attributes of software architectures

UNIT I INTRODUCTION AND ARCHITECTURAL DRIVERS  9

UNIT II QUALITY ATTRIBUTE WORKSHOP  9
Quality Attribute Workshop–Documenting Quality Attributes –Six part scenarios–Case studies

UNIT III ARCHITECTURAL VIEWS  9

UNIT IV ARCHITECTURAL STYLES  9
Introduction–Data flow styles–Call-return styles–Shared Information styles-Event styles–Case studies for each style.

UNIT V DOCUMENTING THE ARCHITECTURE  9
Good practices–Documenting the Views using UML–Merits and Demerits of using visual languages – Need for formal languages - Architectural Description Languages – ACME – Case studies. Special topics: SOA and Web services–Cloud Computing–Adaptive structures

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Explain the basic architectural requirements and influence of architecture on business and technical activities
- Choose the appropriate quality attributes and its scenarios
- Identify the standard architectural views
- Categorize various architectural styles
- Adapt good practices for documenting the architecture and Describe the recent trends in software architecture

TEXT BOOKS:
1. Len Bass, Paul Clements, and Rick Kazman," Software Architectures Principles and nd
REFERENCE BOOKS:


OBJECTIVES:
- To learn how to immediately start producing software incrementally regardless of existing engineering practices or methodologies
- To learn how to simplify the implementation of Agile processes
- To learn how to simplify XP implementation through a Scrum wrapper
- To learn why Agile processes work and how to manage them
- To understand the theoretical underpinnings of Agile processes

UNIT I  FUNDAMENTALS OF AGILE

UNIT II  AGILE SCRUM FRAMEWORK
Introduction to Scrum, Project phases, Agile Estimation, Planning game, Product backlog, Sprint backlog, Iteration planning, User story definition, Characteristics and content of user stories, Acceptance tests and Verifying stories, Project velocity, Burn down chart, Sprint planning and retrospective, Daily scrum, Scrum roles – Product Owner, Scrum Master, Scrum Team, Scrum case study, Tools for Agile project management

UNIT III  AGILE TESTING
The Agile lifecycle and its impact on testing, Test-Driven Development (TDD), xUnit framework and tools for TDD, Testing user stories - acceptance tests and scenarios, Planning and managing testing cycle, Exploratory testing, Risk based testing, Regression tests, Test Automation, Tools to support the Agile tester

UNIT IV  AGILE SOFTWARE DESIGN AND DEVELOPMENT

UNIT V  INDUSTRY TRENDS
Market scenario and adoption of Agile, Agile ALM, Roles in an Agile project, Agile applicability, Agile in Distributed teams, Business benefits, Challenges in Agile, Risks and Mitigation, Agile projects on Cloud, Balancing Agility with Discipline, Agile rapid development technologies

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the course students will be able to
• Discuss the basic concepts of organizational management
• Explain various organization structures and standards
• Understand the need for motivation, control and coordination in an organizational structure.
• Implement managerial functions with modern comprehensive management tools.

TEXT BOOKS:

REFERENCE BOOKS:
5. www.it-ebooks.info/tag/agile
OBJECTIVES:
- To introduce the fundamentals of Intrusion Detection in order to avoid common pitfalls.
- To explain intrusion detection alerts and logs to distinguish attack types from false alarms.
- To import Intrusion Detection tools and techniques in order to improve the security posture of an enterprise.

UNIT I - INTRODUCTION

UNIT II - THEORETICAL FOUNDATIONS OF DETECTION
Taxonomy of anomaly detection system – fuzzy logic – Bayes theory – Artificial Neural networks – Support vector machine – Evolutionary computation – Association rules – Clustering

UNIT III - ARCHITECTURE AND IMPLEMENTATION
Centralized – Distributed – Cooperative Intrusion Detection - Tiered architecture

UNIT IV - JUSTIFYING INTRUSION DETECTION AND ORGANIZATIONS STANDARDS
Intrusion detection in security – Threat Briefing – Quantifying risk – Return on Investment (ROI) - Law Enforcement / Criminal Prosecutions – Standard of Due Care – Evidentiary Issues, Organizations and Standardizations

UNIT V - APPLICATIONS AND TOOLS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Compare various types of intrusion detections and techniques.
- Adapt different architectures and implementation.
- Originate security policies and organization standards.
- Discuss various intrusion detection tools.

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:
- To explain the characteristics and components of windows
- To familiarize various controls for the windows
- To summarize the various problem in windows design with color, text, graphics and testing methods

UNIT I इNTRODUCTION

UNIT II HUMAN COMPUTER INTERACTION

UNIT III WINDOWS

UNIT IV MULTIMEDIA

UNIT V WINDOWS LAYOUT– TEST

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of user interfaces and design principles to design any web application
- Design the interfaces using system components, HCI concepts and principles that meet with realistic constraints
- Apply the knowledge of window characteristics to develop any applications.
- Conduct investigations on different applications with modern IT tools to assess the user interface design
- Apply the knowledge of different testing techniques to identify the problem in web designs

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:
- To review the fundamentals of Information Systems
- To demonstrate the knowledge through system structure
- To import the knowledge involved in Decision Making Process

UNIT I INFORMATION SYSTEM AND ORGANIZATION

UNIT II REPRESENTATION AND ANALYSIS OF SYSTEM STRUCTURE

UNIT III SYSTEMS, INFORMATION AND DECISION THEORY

UNIT IV INFORMATION SYSTEM APPLICATION

UNIT V DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Understand the concept of information systems for various organization
- Apply the appropriate problem solving techniques for business frameworks
- Understand the decision theory related to information systems
- Recognize the need for information Technology tools
- Select and apply appropriate techniques, resources and modern IT tools to complex engineering activities

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:
- To emphasize the need for Grid computing in solving large scale problems
- To explain grid computing infrastructures and cloud services
- To introduce programming models and security issues in the grid and cloud environment

UNIT I INTRODUCTION 9

UNIT II GRID SERVICES 9

UNIT III VIRTUALIZATION 9
Cloud deployment models: public, Private, Hybrid, community–Categories of cloud computing: Everything as a service: Infrastructure, platform, software-Pros and Cons of cloud computing–Implementation levels of virtualization–virtualization structure–virtualization of CPU, Memory and I/O devices–virtual clusters and Resource Management–Virtualization for data center automation.

UNIT IV PROGRAMMING MODEL 9

UNIT V SECURITY 9
Trust models for Grid security environment – Authentication and Authorization methods – Grid security infrastructure–Cloud Infrastructure security: network, host and application level–aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud, Key privacy issues in the cloud.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Understand the role of grid computing techniques to solve large scale problems
- Apply the virtualization concepts
- Demonstrate various grid and cloud tool kits
- Exhibit knowledge on security models in the grid and cloud environment
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the fundamental concepts of big data analytics
- To explain big data analysis using intelligent techniques
- To familiarize the various search methods, clustering techniques and frameworks and visualization approaches

UNIT I  INTRODUCTION TO BIGDATA

UNIT II  DATA ANALYSIS

UNIT III  MINING DATA STREAMS

UNIT IV  FREQUENT ITEM SETS AND CLUSTERING
Mining Frequent item sets- Market based model–Apriori Algorithm–Handling large data sets in Main memory –Limited Pass algorithm–Counting frequent item sets in a stream–Clustering Techniques–Hierarchical–K-Means–Clustering high dimensional data–CLIQUE and PROCLUS–Frequent pattern based clustering methods–Clustering in non-euclidean space–Clustering for streams and Parallelism.

UNIT V  FRAMEWORKS AND VISUALIZATION
Map Reduce– Hadoop, Hive, MapR–Sharding– No SQLDatabases-S3 –Hadoop Distributed file systems–Visualizations-Visual data analysis techniques, Interaction techniques; Systems and applications

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Comprehend the statistical analysis methods in handling big data
- Identify appropriate soft computing frameworks in real-time mining
- Apply stream data mining
- Develop searching and clustering techniques to large datasets
- Demonstrate knowledge in visualization techniques
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:

- To familiarize functional / nonfunctional requirements, business scenario and document the use case diagrams in the given template
- To demonstrate logical architecture for the given business scenario documented in use case diagrams
- To import data architecture for the given logical architecture

UNIT I INTRODUCTION

Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications

UNIT II DESIGN PHASE

Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, nonfunctional requirements, requirements validation, planning and estimation

UNIT III ARCHITECTURE DESIGN

Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design

UNIT IV IMPLEMENTATION METHODOLOGIES

Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage

UNIT V VALIDATION

Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.

TOTAL: 45 PERIODS
COURSE OUTCOMES:
- List the skills required to built the enterprise application
- Estimate the requirement for business model
- Design architecture and networking model for an application
- Construct and develop different solution layers
- Build a suitable test case for an application

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To explain mobile adhoc networks, design, implementation issues, routing and clustering mechanism
- To import the 802.11 Wireless Lan (WiFi) and Bluetooth standards
- To demonstrate designing and implementing adhoc network functionality using network simulation tools and Pocket PCs

UNIT I ROUTING
Cellular and Ad hoc wireless networks – Issues of MAC layer and Routing – Proactive, Reactive and Hybrid Routing protocols – Multicast Routing – Tree based and Mesh based protocols – Multicast with Quality of Service Provision

UNIT II QUALITY OF SERVICE

UNIT III ENERGY MANAGEMENT ADHOC NETWORKS

UNIT IV MESH NETWORKS
Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – Opportunistic Routing – Self Configuration and Auto Configuration - Capacity Models Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks

UNIT V SENSOR NETWORKS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Discuss the routing mechanism and solutions for quality of service.
- Compare the schemes for energy management of ad hoc networks
- Explain different types Mesh Networks for various applications
- Choose information and dissemination protocols for real time sensor networks
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce software testing principles
- To import knowledge on various software testing and test case design strategies
- To summarize test planning, monitoring and controlling approaches using testing tools

UNIT I INTRODUCTION

UNIT II TEST CASE DESIGN

UNIT III LEVELS OF TESTING

UNIT IV TEST AMANAGEMENT

UNIT V TEST AUTOMATION

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the software testing principles and its defects
- Develop test cases to exercise a software
- Design and conduct various types and levels of software testing for a software project
- Apply various testing techniques, including domain, code, fault, usage and model based for real time applications
- Make use of Automated testing tools for software project

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the basic concepts of software agents and its characteristics
- To import the significance of agent classifications, models / architectures and the methods used for communication
- To review avenues of Intelligent agent based applications

UNIT I  INTRODUCTION  8

UNIT II  AGENT CLASSIFICATION  9

UNIT III  AGENT MODELING  10

UNIT IV  AGENT COMMUNICATION  8

UNIT V  APPLICATIONS OF AGENTS  10

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Classify the agents according to their characteristics and functionalities.
- Build a Multi-Agent Architecture for an application.
- Illustrate various Agent Communication Protocols.
- Construct Agent Based applications.
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To explain the relationship between system software and machine architecture
- To demonstrate the design and implementation of assemblers, linkers and loaders
- To familiarize the macro processors and system software tools

UNIT I  INTRODUCTION
System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II  ASSEMBLERS

UNIT III  LOADERS AND LINKERS

UNIT IV  MACRO PROCESSORS

UNIT V  SYSTEM SOFTWARE TOOLS
Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other parts of the system – User-Interface Criteria.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Understand the Architecture of SIC Machine
- Discuss Assembler, Loader and their design aspects
- Explain Macro Processors Functions and Design Options
- Develop Application using System Software Tools
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:

- To demonstrate the computational aspects and soft computing approaches in biotechnology
- To explain the evolution of life
- To familiarize the advancements in biotechnology

UNIT I  INTRODUCTION  9

UNIT II  DATABASES  9
Data management – data life cycle – database technology – interfaces and implementation – biological databases and their uses

UNIT III  PATTERN MATCHING & MACHINE LEANING  9

UNIT IV  PHYLOGENY  9
Introduction; mutations; irrelevant mutations; controls; mutations as measure of time; distances; reconstruction; distances between species; estimating intervals from distances

UNIT V  ADVANCED TOPICS IN BIOINFORMATICS  9

COURSE OUTCOMES:
After the successful completion of the course students will be able to

- Express modern biology and its relationship with informatics
- Discuss various DB technology with respect to bioinformatics
- Describe Bioinformatics Algorithms and utilize its tools
- Develop Biomolecular and cellular computing applications

TEXT BOOKS:

TOTAL: 45 PERIODS
REFERENCE BOOKS:
OBJECTIVES:

- To explain the ways and means of creating and storing digital content
- To demonstrate the basics of content management and design issues
- To familiarize the key technologies to build content management systems.

UNIT I  CREATING DIGITAL CONTENT  8

UNIT II  COMPRESSING AND INDEXING  9

UNIT III  CONTENT MANAGEMENT  10

UNIT IV  DESIGN OF CMS  8
The Wheel of CMS — Working with Metadata – Cataloging Audiences Designing Publications – Designing content Components – Accounting for Authors – Accounting for Acquisition sources.

UNIT V  BUILDING CMS  10
Content Markup Languages – XML and Content Management – Processing Content.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to

- Discuss the purpose and value of Digital Asset Management.
- Evaluate the various compression and indexing techniques
- Explain various metadata standards.
- Develop applications based on Content of Management system.

TEXT BOOKS:

REFERENCE BOOKS:


OBJECTIVES:
- To explain the internals of the TCP/IP protocols
- To demonstrate how TCP/IP is actually implemented
- To familiarize the interaction among the protocols in a protocol stack

UNIT I  INTRODUCTION
Internetworking concepts and architectural model - classful Internet address - CIDR-Subnetting and Supernetting - ARP - RARP - IP - IP Routing - ICMP - IPv6

UNIT II  TCP
Services - header - connection establishment and termination - interactive data flow - bulk data flow - timeout and retransmission - persist timer - keepalive timer - futures and performance

UNIT III  IP IMPLEMENTATION
IP global software organization - routing table - routing algorithms - fragmentation and reassembly - error processing (ICMP) - Multicast Processing (IGMP)

UNIT IV  TCP IMPLEMENTATION I
Data structure and input processing - transmission control blocks - segment format - comparison - finite state machine implementation - Output processing - mutual exclusion - computing the TCP data length

UNIT V  TCP IMPLEMENTATION II
Timers - events and messages - timer process - deleting and inserting timer event - flow control and adaptive retransmission - congestion avoidance and control - urgent data processing and push function.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Outline various communication protocols
- Explain the purpose of various TCP timers.
- Describe the IP routing concepts.
- Compare various implementations of TCP.

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To demonstrate GNU/Linux Architecture and Linux Distributions
- To explain the File Handling and Graphics Tools
- To import the Linux Web Server Using LAMP

UNIT I  GNU/LINUX ARCHITECTURE AND DEVELOPMENT TOOLS  9
GNU/Linux Architecture, Architectural Breakdown of Major Kernel Components, Linux distributions, GNU Compiler Tool Chain, Building Software with GNU Make, Makefile Constructs. Static-Shared-Dynamic Libraries, Building packages with Automake / Autoconf

UNIT II  DEPLOYMENT TOOLS  9
Components of a LAMP Server, Manage Multiple Websites with Virtual Hosts, Encrypt Sensitive Pages with SSL, Enable Server-side Includes and CGI Scripts

UNIT III  FILE HANDLING TOOLS AND GRAPHICS TOOLS  9
File Handling-API-Character access mechanisms, String access mechanisms, Sequential and Random access methods, Graphics File Formats, Diagramming with Dia, Open Office Draw, GIMP

UNIT IV  TEXT PROCESSING TOOLS  9
Bash beginnings, Pathnames and Permissions, Useful elements, cron Job, Script Versions Text Processing with awk and sed scripts

UNIT V  VERSIONING CONTROL, COPYRIGHT ISSUES AND LICENSES  9
Standards for free software projects, Version Control, Bug Tracker, Wikis, Website Licenses, Patents, Copyright assignment and Ownership, Dual Licensing Schemes.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Discuss the architecture and tools for FOSS development.
- Explain deployment tools.
- Build tools for file handling, graphics and text processing.
- Apply various standards, copyright issues and licenses for FOSS.

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the concept of semantic web and related applications
- To explain the knowledge representation using ontology
- To review human behavior in social web and visualization of social networks

UNIT I  INTRODUCTION

UNIT II  MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION

UNIT III  EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS

UNIT IV  PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES

UNIT V  VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS

TOTAL: 45 PERIODS
COURSE OUTCOMES:
- Develop semantic web related applications
- Represent knowledge using ontology
- Predict human behavior in social web and related communities.
- Visualize social networks.

TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To introduce the fundamentals of hacking
- To summarize different types of attacks and threats
- To review the fraud prevention approaches and forensic tools

UNIT I INTRODUCTION TO HACKING 9

UNIT II ATTACK TYPES 9

UNIT III THREAT MANAGEMENT 9

UNIT IV FRAUD PREVENTION 9

UNIT V FORENSICS AND TOOLS 9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Evaluate the ethical Hacking Techniques.
- Classify the types of attacks and threat management.
- Adapt various techniques to improve security.
- Describe the tools for forensics systems.

TEXT BOOKS:
REFERENCE BOOKS:
OBJECTIVES:
- To introduce the fundamentals of datamining and its functionalities
- To familiarize knowledge in different datamining techniques and algorithms
- To review various application domains of datamining

UNIT I  DATA WAREHOUSING
Introduction to Data Warehousing-An overview and definition-Differences between Operational Database Systems and Data Warehouses-Difference between OLTP&OLAP-Multi-dimensional Data Model- Star, Snow flakes, and Fact Constellations Schemas for Multi-dimensional Databases- OLAP Operations in Multi-dimensional Data Model: Roll-up, Drill-down, Slice & Dice, Pivot(Rotate)-Indexing OLAP Data-Type of OLAP Servers-ROLAP versus MOLAP versus HOLAP-Data Warehouse Architecture-The Design of A Data Warehouse - The Process of Data Warehouse Design-A3-Tier Data Warehouse Architecture

UNIT II  DATAMINING

UNIT III  ASSOCIATIONRULEMININGANDCLASSIFICATION
Mining Frequent Patterns, Associations and Correlations–Mining Methods–Mining Various Kinds of Association Rules–Correlation Analysis–Constraint Based Association Mining-Classification and Prediction-Basic Concepts-Decision Tree Induction–Bayesian Classification –Rule Based Classification–Classification by Back propagation – Support Vector Machines–Associative Classification–Lazy Learners–Other Classification Methods–Prediction

UNIT IV  CLUSTERING AND APPLICATIONS

UNIT V  ADVANCED MINING
Webmining, Webcontent mining. Introduction to Spatial mining & its primitives, spatial classification algorithm (ID3extension),Spatial clustering algorithm(SD), Introduction to temporal mining, Time series, Temporal association rule

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Identify and analyze appropriate data warehousing techniques for a engineering problems
- Apply the basic knowledge of preprocessing techniques for real time applications supports data mining concepts.
- Apply appropriate techniques to implement association mining and classification algorithms
- Apply the knowledge of clustering method for an application
- Analyze an appropriate mining method for an application to improve the mining process.
TEXT BOOKS:

REFERENCE BOOKS:
OBJECTIVES:
- To understand the fundamentals of satellite communications
- To explain the design issues of the satellite subsystem and link
- To familiarize the satellite broadcasting techniques applications of GPS

UNIT I  INTRODUCTION  9
Origin of Satellite Communications, Historical Background, Basic Concepts of Satellite Communications, Frequency allocations for Satellite Services, Applications, Future Trends of Satellite Communications

UNIT II  ORBITAL MECHANICS AND LAUNCHERS  9
Orbital Mechanics, Look Angle determination, Orbital perturbations, Orbit determination, launches and launch vehicles, Orbital effects in communication systems performance.

UNIT III  SATELLITE SUBSYSTEMS AND SATELLITE LINK DESIGN  9
Attitude and orbit control system, telemetry, tracking, Command and monitoring, power systems, communication subsystems, Satellite antenna Equipment reliability and Space qualification- Basic transmission theory, system noise temperature and G/T ratio, Design of down links, up link design, Design of satellite links for specified C/N, System design example.

UNIT IV  MULTIPLE ACCESS  9
Frequency division multiple access (FDMA) Intermodulation, Calculation of C/N. Time division Multiple Access (TDMA) Frame structure, Examples. Satellite Switched TDMA Onboard processing, DAMA, Code Division Multiple access (CDMA), Spread spectrum transmission and reception.

UNIT V  SATELLITE NAVIGATION AND GPS  9
Radio and Satellite Navigation, GPS Position Location principles, GPS Receivers and codes, Satellite signal acquisition, GPS Navigation Message, GPS signal levels, GPS receiver operation, GPS C/A code accuracy, Differential GPS.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Understand the basics of satellite communication & orbital mechanism.
- Discuss broadcast subsystems and system link models
- Identify Satellite Multiple Access Protocol for an application.
- Construct satellite navigation receiver

TEXT BOOKS:
REFERENCE BOOKS:

OBJECTIVES:

- To introduce storage architectures and key data center elements in classic, virtualized, and cloud environments.
- To explain storage networking technologies such as FC SAN, IP SAN, FCoE, NAS, and object-based and unified storage.
- To discuss the Backup and Archive in virtualized and non-virtualized environment.
- To demonstrate the cloud environment with secured storage infrastructure.

UNIT I  STORAGE SYSTEMS  8

Introduction to information storage - evolution of storage architecture, key data center elements, virtualization, and cloud computing - Data center environment - Details key data center elements – host (or compute), connectivity, storage, and application in both classic and virtual environments - RAID - RAID implementations, techniques, and levels along with the impact of RAID on application performance - Intelligent storage system - Details components of intelligent storage systems. It also covers virtual storage provisioning and intelligent storage system implementations.

UNIT II  STORAGE NETWORKING TECHNOLOGIES  12

Fibre Channel Storage Area Network (FC SAN) - FC SAN components, connectivity options, and topologies including access protection mechanism „zoning“. IP SAN and Fibre Channel over Ethernet (FCoE) - iSCSI and FCIP protocols for storage access over an IP network. Converged protocol FCoE and its components. Network Attached Storage (NAS) - File sharing technology using NAS and covers its benefits, components, and implementations. File level storage virtualization. Object based and Unified Storage - Emerging areas of object-based storage and unified storage solutions. Content addressed storage (CAS) as an implementation of an object-based solution.

UNIT III  BACKUP, ARCHIVE, AND REPPLICATION  10

Introduction to Business Continuity - information availability and business continuity solutions in both virtualized and non-virtualized environments. Backup and Archive - Backup and recovery in both virtualized and non-virtualized environments - Deduplication technology to optimize data backups along with archival solutions to address fixed content storage requirements. Local Replication - Local replications of data along with data restore and restart considerations. Remote Replication - Remote replication technologies in virtualized and non-virtualized environments. Three-site replication and continuous data replication.

UNIT IV  CLOUD COMPUTING  7

Cloud Computing - Cloud computing, its benefits, characteristics, deployment models and services. Cloud challenges and migration considerations.

UNIT V  SECURING AND MANAGING STORAGE INFRASTRUCTURE  8

Securing the Information Infrastructure - Framework and domains of storage security along with covering security implementation at storage networking. Security in virtualized and cloud environments. Managing the Information Infrastructure - storage infrastructure monitoring and management - storage tiering, information lifecycle management (ILM), and cloud service management activities

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After successful completion of the course, the students will be able to
- Discuss the various storage system principles
- Describe storage networking technology requirements and solutions
- Explain about the data replication techniques
- Demonstrate cloud deployment models and services
- Identify parameters for managing and monitoring storage infrastructure

TEXT BOOKS:

REFERENCE BOOKS:
1. G. Somas Sundaram, Alok Shrivastava, “ Information Storage and Management ”, Wiley, India,
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, " Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE ", Wiley, India,
OBJECTIVES:
• To introduce the basic concepts of information theory and source coding
• To familiarize the students with the concept of Text, Audio, Video, Image and speech compression Techniques and error control codes

UNIT I INFORMATION THEORY

UNIT II SOURCE CODING: TEXT, AUDIO AND SPEECH
Text: Adaptive Huffman Coding, Arithmetic Coding, Dictionary techniques LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MPEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

UNIT III SOURCE CODING: IMAGE AND VIDEO

UNIT IV ERROR CONTROL CODING: BLOCK CODES
Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder and decoder – CRC

UNIT V ERROR CONTROL CODING: CONVOLUTIONAL CODES
Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After successful completion of this course, the Students will be able to
• Explain about the basic concepts of information theory
• Apply source coding techniques to Text, Audio, speech, image and Video
• Differentiate Source coding and Channel coding
• Design an efficient data compression scheme for a given information source
• Design different types of error control codes to the given information source for error correction and error detection
TEXT BOOKS:

REFERENCE BOOKS: