B.TECH INFORMATION TECHNOLOGY

REGULATIONS 2015

REVISED CURRICULUM AND SYLLABUS
(1st SEMESTER TO 8th SEMESTER)
(FOR THOSE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2015-2016 ONWARDS)

Approved in the Academic Council Meeting held on 25.08.2018

CHAIRMAN

ACADEMIC COUNCIL
SETHU INSTITUTE OF TECHNOLOGY
(An Autonomous Institution)

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25.08.2018

CHAIRMAN
ACADEMIC COUNCIL
# OVERALL COURSE STRUCTURE

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# COURSE CREDITS – SEMESTERWISE

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#### THEORY

- **TOTAL**: 17 4 6 22

#### PRACTICAL

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- **TOTAL**: 17 4 6 22

Total No. of Credits – 22

### Semester IV

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#### THEORY

- **TOTAL**: 19 2 6 23

#### PRACTICAL

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Total No. of Credits – 23
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Total No. of Credits – 22

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## OPEN ELECTIVES

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Semester I

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Total No. of Credits – 22
Syllabus under Regulation 2015  
(Common to all Branches of Engineering)  
I Semester  

15UEN101  
TECHNICAL ENGLISH  
L T P C  
2 0 0 2  

PRE-REQUISITES: 

COURSE OBJECTIVE:  
- To enhance the vocabulary of students  
- To strengthen the application of functional grammar and basic skills  
- To improve the language proficiency of students  

UNIT I  

UNIT II  

UNIT III  

UNIT IV  
Grammar - Conditional clauses - Vocabulary - Idioms & Phrases - Writing Letters to Editor - Making Invitations - Acceptance & Declining - Summarizing –Reading - Prose: Computers-Peter Laurie  

UNIT V  

TOTAL: 30(L) = 30 PERIODS
COURSE 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:

REFERENCE BOOKS:
OBJECTIVES:

- To make the students capable of identifying algebraic eigen value problems from practical areas and obtain the eigen solutions in certain cases.
- To make the students knowledgeable in integrating various types of functions using various integration methods.
- To familiarize the students with the basic rules of differentiation and use them to find derivatives of products and quotients that they might encounter in their studies of other subjects in the same or higher semesters.

UNIT I DIFFERENTIAL CALCULUS

Introduction – Definition of derivatives – Limits and Continuity – Differentiation techniques (Product rule, Quotient rule, Chain rule) – Successive differentiation (n\textsuperscript{th} derivatives) – Leibnitz theorem (without proof) – Maclaurin’s series – Physical Applications (Newton’s law of cooling – Heat flow problems, Rate of decay of radioactive materials - Chemical reactions and solutions, Ohm’s law, Kirchoff’s law – Simple electric circuit problems)

UNIT II FUNCTIONS OF SEVERAL VARIABLES


UNIT III INTEGRAL CALCULUS


UNIT IV MULTIPLE INTEGRALS

Double integration – Cartesian and Polar coordinates – Change of order of integration – Area as a double integral - Change of variables between Cartesian and Polar coordinates – Triple integration in Cartesian coordinates – Volume as triple integral.
UNIT V MATRICES


SUPPLEMENT TOPIC (for internal evaluation only)-3

Evocation / Application of Mathematics, Quick Mathematics – Speed Multiplication and Division Applications of Matrices.

TOTAL : 45 (L) + 30 (T) = 75 Periods

COURSE OUTCOMES:

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

1. Find the derivative of the given function using the suitable rule. Find its successive differentiation
2. Predict the extreme values of functions with constraints and fine the absolute maximum and minimum of a given function on different domains
3. Apply the various methods of integration for evaluating definite integrals
4. Demonstrate the use of double and triple integrals to compute area and volume
5. Find inverse and positive power of given matrix using Cayley Hamilton theorem, reduce to canonical form by orthogonal transformation

TEXT BOOKS:

REFERENCE BOOKS:


PRE-REQUISITES:

COURSE OBJECTIVE:
- To develop the research interest in crystal physics
- To make students to understand classification of sound and applications of Ultrasonics
- To use the principles of Lasers and its types
- To apply principles of Quantum physics in engineering field
- To develop knowledge on principles of Thermal Physics

UNIT I  CRYSTAL PHYSICS
Crystalline – Amorphous materials – single and poly crystal - Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – parameters of Unit cell – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – crystal growth technique - Bridgeman method.

UNIT II  ACOUSTICS AND ULTRASONICS

UNIT III  WAVE OPTICS AND LASERS

UNIT IV  QUANTUM PHYSICS

UNIT V  PROPERTIES OF SOLIDS AND THERMAL PHYSICS

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Analyze the basic concepts of crystalline materials and the various crystal structure like FCC, BCC, HCP, etc.
- A conceptual understanding of the physics of ultrasound and helps the students to apply in different industries and its application in 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.,
- Construct a quantum mechanical model to explain the behaviour of a system at microscopiclevel
- Explain the behavior of bending beams and calculate the expression for young modulus

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:

- Introduction to the fundamental concepts of chemical bonds.
- Understand the principles and applications of corrosion science.
- Gain knowledge about energy storage devices & Electrochemical sensors.
- Understand the principles and applications of spectroscopy and the concept of green chemistry.
- Acquire knowledge on smart materials.

UNIT I CHEMICAL BONDING


UNIT II ELECTRO CHEMISTRY AND CORROSION


UNIT III CONVENTIONAL ENERGY STORAGE DEVICES AND SENSORS

Conventional devices - Batteries- Primary and secondary batteries- Construction, working and applications of Zn – MnO₂, Lead acid storage and Cd batteries. Fuel cells – Differences between battery and fuel cell, construction and working of H₂ – O₂ fuel cell.

Electrochemical sensors: Chemically modified electrode (CMEs) – Concept, CMEs sensors, Chemical sensors – gas sensors – ion selective electrodes, principle, types (solid state membranes and liquid membranes) and applications. Biosensors – electrochemical biosensors – glucose biosensors.
UNIT IV  INSTRUMENTATION FOR ANALYTICAL METHODS AND GREEN CHEMISTRY
Green chemistry – Concept, importance, principles – e- waste disposal

UNIT V  POLYMERS& SMART MATERIALS
Introduction- Terminology- structure and properties -Types of Polymerisation-Conducting polymers – Chemical and Electrochemical doping; Charge transfer polymer – Polymers filled with conductive solids, Organic Light emitting diodes – Principles and applications, Liquid crystals – definition and applications.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
At the end of the course, students will be able to
• Understanding the concepts of ecosystem and biodiversity
• Acquire knowledge about the impact of environmental pollution.
• Awareness on various types of resources.
• Understand the importance of environmental issues in the society
• Awareness about the impact of environment related to human health.

TEXT BOOKS:

REFERENCES:
COURSE OBJECTIVES:
- To impart the concepts in basic organization of computers and problem solving techniques.
- To familiarize the programming constructs of C.
- To explain the concepts of arrays, strings, functions, pointers, structures and unions in C.

UNIT I INTRODUCTION

UNIT II C PROGRAMMING BASICS

UNIT III DECISION MAKING AND LOOPING STATEMENTS

UNIT IV ARRAYS, STRINGS AND FUNCTIONS

UNIT V POINTERS, STRUCTURES AND UNIONS

TOTAL: 45 Periods

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


REFERENCE BOOKS :

COMPUTER PROGRAMMING LABORATORY

15UCS109

(Common to ALL Branches )

0 0 2 1

COURSE OBJECTIVES :

- To make the students to work with Office software.
- To familiarize the implementation of programs in C.

LIST OF EXPERIMENTS

a) **Word Processing**
   - Document creation, Formatting, Table Creation, Mail merge

b) **Spread Sheet**
   - Chart - Line, XY, Bar and Pie, Formula - formula editor.

c) **C Programming**
   - Programs using simple statements
   - Programs using decision making statements
   - Programs using looping statements
   - Programs using one dimensional and two dimensional arrays
   - Solving problems using string functions
   - Programs using user defined functions and recursive functions
   - Programs using pointers
   - Programs using structures and unions

TOTAL: 30 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student 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.
HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

HARDWARE
LAN SYSTEM WITH 30 NODES (OR) STANDALONE PCS – 30 NOS.

SOFTWARE
OS – UNIX CLONE (License free Linux)
APPLICATION PACKAGE – OFFICE SUITE
COMPILER – C
ENGINEERING GRAPHICS
15UME108
(COMMON TO ALL BRANCHES)

L T P C
3 2 0 4

PRE-REQUISITES:

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
- To impart knowledge in development of surfaces, isometric and perspective projection

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION)

UNIT I
PLANE CURVES, PROJECTION OF POINTS, LINES AND PLANE SURFACES 9+5
Plane Curves: (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.
Projections:
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 II
PROJECTION OF SOLIDS 9+6
Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to Horizontal plane (HP) only.

UNIT III
SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES 9+6
Sectioning of above solids in simple vertical position by cutting planes inclined to Horizontal plane (HP) and perpendicular to the VP – Obtaining true shape of section.
Development of lateral surfaces of simple and truncated solids inclined to Horizontal plane (HP) only – Prisms, pyramids, cylinders and cones.

UNIT IV
ISOMETRIC AND PERSPECTIVE PROJECTIONS 9+6
Isometric Projections
Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones when cutting plane inclined to Horizontal plane (HP) only.
Perspective Projections (Not for Examination)
Perspective projection of prisms, pyramids and cylinders by visual ray method.

UNIT V  ORTHOGRAPHIC PROJECTION  9+6
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 of multiple views from pictorial views of objects.

TOTAL: 45(L) + 30 (T) = 75 PERIODS

COURSE OUTCOMES:
After successful completion of this course the students will be able to
• Discuss first angle projection to project straight line, planes and solids.
• Illustrate simple solids like prisms, pyramids, cylinder and cone.
• Construct section of solids and development of surfaces for engineering applications.
• Prepare isometric views of objects like truncated solids and frustums.
• Prepare orthographic views from isometric drawings.

TEXT BOOKS:

REFERENCE BOOKS:
   DhananjayA.Jolhe, “Engineering Drawing with an introduction to Auto CAD”,
ENGINEERING FUNDAMENTALS LABORATORY

15UCS111
(Common to CSE, ECE & IT)

L T P C
0 0 2 1

COURSE OBJECTIVES:
• To demonstrate the hardware components of a computer.
• To train the students to assemble the hardware components of a computer.
• To train the students to install software.
• To demonstrate residential house wiring, fluorescent lamp wiring, measurement of earth resistance, colour coding of resistors, logic gates and soldering.

LIST OF EXPERIMENTS

GROUP A (COMPUTER)

I) COMPUTER ENGINEERING PRACTICE

a) Demonstration on basic Hardware Components of Computer
b) Assembling of Hardware Components of Computer
c) Installation of Operating Systems (Windows Xp, Windows 7)
d) Installation of Drivers for Windows xp
e) Installation of Application software
f) Installation of Anti Virus Software
g) Preventive maintenance of a PC
h) Install and configure network interface card in LAN system

TOTAL: 30 Periods

GROUP B (ELECTRICAL & ELECTRONICS)

II) ELECTRICAL ENGINEERING PRACTICE

(a) Residential house wiring using switches, fuse, indicator, lamp and energy meter and Stair case wiring
(b) Fluorescent lamp wiring.
(c) Measurement of resistance to earth of electrical equipment.

III) 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 AND, OR, EX-OR and NOT Gate.
(c) Soldering practice – Components, Devices and Circuits – Using general purpose PCB.

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
• Identify the Hardware Components of Computer.
• Perform installation of software.
• Demonstrate the basic network settings.
• Execute the basic wiring, soldering etc.
• Solve the problems that are encountered in basic engineering work.
## Equipment Requirements

### Electrical Engineering

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<th>Name of the Equipment/Software</th>
<th>Quantity Required</th>
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<td>1</td>
<td>Assorted electrical components for housewiring</td>
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<tr>
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<td>Electrical measuring instruments</td>
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<td>Megger (250V/500V)</td>
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<td>Study purpose items: Iron box, fan and regulator, emergency lamp</td>
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<tr>
<td>5</td>
<td>Power Tools: (a) Range Finder (b) Digital Live-wired detector</td>
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### Electronics Engineering

<table>
<thead>
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<th>Sl. No.</th>
<th>Name of the Equipment/Software</th>
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<tbody>
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<td>Logic trainer kit</td>
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<tr>
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<td>Small multipurpose PCBs</td>
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<td>Soldering guns</td>
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<td>5</td>
<td>Multimeters</td>
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<tr>
<td>6</td>
<td>Assorted electronic components for making circuits</td>
<td>Required quantity</td>
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### Hardware Components

Mother Board, RAM, Ethernet Card, CMOS Battery, SMPS, Processor, WIFI Card, LAN Cables,

### Software

OS – Windows XP, Windows 7

Driver Softwares (Any)

Application Package (Any)
PHYSICS LABORATORY
(Common to All Branches)

COURSE OBJECTIVE:
- To create scientific Temper among the students.
- To know how to execute experiments properly, presentation of observations and arrival of conclusions.
- To view and realize the theoretical knowledge acquired by the students through experiments

LIST OF EXPERIMENTS:
2. Ultrasonic Interferometer - Determination of velocity of sound and compressibility of liquid.
5. Compound pendulum – Determination of the acceleration due to gravity
6. Air Wedge method - Determination of thickness of a thin wire.

- A minimum of FIVE experiments shall be offered

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student shall be able to
- Determine the thickness of various micro level objects using air wedge method.
- Analyze the viscous properties of various liquids using Poiseuille’s method.
- Compare the velocity of ultrasonic waves in various liquids by ultrasonic interferometer method.

CHEMISTRY LABORATORY

COURSE OBJECTIVE:
- To impart knowledge on basic concepts in application of chemical analysis
- Train the students to handle various instruments.
- To acquire knowledge on the chemical analysis of various metal ions.
LIST OF EXPERIMENTS:
(Common to ECE,EEE,EIE,CSE.IT, & Biomedical Engg)

1. Preparation of molar and normal solutions of the following substances – Oxalic acid, Sodium Carbonate, Sodium Hydroxide and Hydrochloric acid
2. Conductometric Titration of strong acid with strong base
3. Estimation of Iron by potentiometry
4. Determination of Strength of given acid using pH metry
5. Determination of molecular weight of polymer by viscometry
6. Comparison of the electrical conductivity of two samples – conductometric method
7. Estimation of copper in brass by EDTA method

Course Outcomes
At the end of the course, the student will able to
- Estimate the ions present in the given sample
- Determine the rate of corrosion, molecular weight and amount of solids in water
- Assess the water quality parameters

A minimum of FIVE experiments shall be offered for every course

TOTAL: 30 PERIODS
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<th>Course Code</th>
<th>Course Title</th>
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Total No. of Credits – 21
BUSINESS ENGLISH & PRESENTATION SKILLS

PRE-REQUISITES:

COURSE OBJECTIVE:

- To use linguistic tools confidently in an English speaking context
- To listen and speak during normal business activities such as interviews, meetings, telephone conversations and negotiations.
- To write business letters, emails, reports, articles and comprehend information on the Internet and other media.
- To gain language skills for real business life situations

UNIT I

Grammar - Numerical Adjective; Vocabulary - Job title and describing jobs; Listening - Listening to company culture; Reading - Quiz; Writing - Writing formal and semi formal business letters; Speaking – Personal information, Companies and products

UNIT II

Grammar – Modals; Vocabulary – Collocations; Listening - Business Proceedings; Reading - Designing websites and e-mail; Writing – Memo -Speaking - Role play on various business situation.

UNIT III

Grammar – prepositions – Articles; Vocabulary – Jargons related to Shares and stock; Listening – Interviews of celebrities; Reading – Shares and stock exchange transactions; Writing – Business report – Minutes of the Meeting; Speaking – Presentations, Making a business talk.

UNIT IV

Grammar - Connectives; Vocabulary – Words related to finance; Listening - Listening to statistical information; Reading - Interpreting business related bar charts; Writing - Letters to express interest in new products; Speaking - Presenting a summary of an article.

UNIT V

Grammar - Reported speech; Vocabulary – Words related to employment ; Listening -Listening to audio and video speech of business people; Reading - Reading News paper article/magazine articles on business; Writing - Writing a Proposal; Speaking - Discussing company policies.

TOTAL: 45(L) = 45 PERIODS
COURSE OUTCOMES:
Upon successful completion of this course, the student will be able to:

- Use business vocabulary effectively to present the ideas.
- Accomplish verbal and written communications.
- Write effectively in a wide range of business letters.
- Prepare Business Proposals and Business Reports for various business purposes.
- Make a presentation in English in various business avenues.

TEXT BOOK:

REFERENCE BOOKS:
OBJECTIVES:

- To develop an understanding of the basics of vector calculus comprising of gradient, divergence and curl, and line, surface and volume integrals and the classical theorems involving them.
- To acquaint the student with the concepts of analytic functions and their interesting properties which could be exploited in a few engineering areas, and be introduced to the host of conformal mappings with a few standard examples that have direct application.
- To make the student acquire sound knowledge of Laplace transform and its properties and sufficient exposure to the solution of certain linear differential equations using the Laplace transform technique.

UNIT I  ANALYTICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS  8 + 6

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy’s and Legendre’s linear equations – Applications of ODE (Bacterial growth, Population growth, Decayed problems).

UNIT II  VECTOR CALCULUS  8 + 6

Gradient Divergence and Curl – Directional derivative – Irrotational and Solenoidal vector fields – Vector integration – Green’s theorem in a plane, Gauss divergence theorem and Stokes’ theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelepiped.

UNIT III  ANALYTIC FUNCTIONS  8 + 6

Functions of a complex variable – Analytic function – Necessary and Sufficient Conditions (excluding Proofs) – Harmonic function - Properties of an analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping: w = z+c, cz, 1/z, and Bilinear transformation.
UNIT IV  COMPLEX INTEGRATION  

Statement and applications of Cauchy's integral theorem, Cauchy's integral formula and Cauchy Residue Theorem – Taylor's and Laurent's expansions – Applications of residue theorem to evaluate real integrals – Unit circle and semi-circular contour (excluding Poles on the real axis).

UNIT V  LAPLACE TRANSFORM  


SUPPLEMENT TOPIC (for internal evaluation only)  


TOTAL : 45 (L) + 30 (T) = 75 Periods

COURSE OUTCOMES:

After the successful completion of this course, the student 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 green theorem, gauss divergence theorem, stokes theorem
• Construct an analytical function using various methods. Also able to convert a function from one domain to another domain using bilinear transformation
• Evaluate the values of a contour integral around a given contour in the complex plane.
• To apply Laplace Transform methods to solve ordinary differential equations.
TEXT BOOKS:


REFERENCE BOOKS:

PRE-REQUISITES:

COURSE OBJECTIVE:
- To introduce the essential principles of physics for information science and related Engineering applications.
- To demonstrate the concepts of conduction in conductors.
- To apply fundamental knowledge in the area of fiber optics.
- To enable the students to understand the dielectric and superconducting materials.

UNIT I CONDUCTING MATERIALS

UNIT II TRANSPORT PROPERTIES OF SEMICONDUCTORS AND MAGNETIC MATERIALS

UNIT III DIELECTRICS AND SUPERCONDUCTION MATERIALS

UNIT IV OPTOELECTRONICS

UNIT V FIBRE OPTICS
Introduction- Principle and propagation of optical fibres - Types of optical fibre- Losses in fibres- Advantages of opicalfibre- Fibre optic communication systems (Block diagram)- Splicing- Fusion and Mechanical splicing- Fibre optic sensors –Temperature and pressure sensor.

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to

- Apply the classical free electron theory and calculate the carrier concentration in metals.
- Classify the materials based on their electrical and magnetic properties.
- Distinguish between perfect conduction and perfect diamagnetism, and give a qualitative description of the Meissner effect.
- Choose the suitable optoelectronic controller and switching devices.
- Apply the concepts of light in optical fibers, light wave communication systems and for sensing physical parameters.

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- Understanding the concepts of ecosystem and biodiversity.
- Acquire knowledge about the impact of environmental pollution.
- Awareness on various types of resources.
- Understand the importance of environmental issues in the society.
- Awareness about the impact of environment related to human health.

MODULE I  ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY  10
Definition, scope and importance of environment – Need for public awareness – Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity – Definition: genetic, species and ecosystem diversity – Biogeographical classification of India – Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

MODULE 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.

MODULE III  FUTURE POLICY AND ALTERNATIVES  9
Future policy and alternatives-fossil fuels-nuclear energy-solar energy-wind energy-hydroelectric energy-geothermal energy-tidal energy-sustainability-green power-nanotechnology-international policy.
MODULE IV  SOCIAL ISSUES AND THE ENVIRONMENT


MODULE V  HUMAN POPULATION AND THE ENVIRONMENT


TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Understanding the concepts of ecosystem and biodiversity.
- Acquire knowledge about the impact of environmental pollution.
- Awareness on various types of resources.
- Understand the importance of environmental issues in the society.
- Awareness about the impact of environment related to human health.

TEXT BOOKS


REFERENCE BOOKS:

COURSE OBJECTIVES:

- To familiarize the concepts of various number systems, Boolean algebra and various logic gates.
- To explain the concepts in designing and analyzing various combinational and sequential circuits.
- To impart the knowledge about the programmable memory logics.

UNIT I  BOOLEAN ALGEBRA AND LOGIC GATES  8


UNIT II  COMBINATIONAL LOGIC  10


UNIT III  DESIGN WITH MSI DEVICES  8

Decoders and encoders - Multiplexers and De Multiplexers - Memory and programmable logic - Implementation of combinational logic using ROM, PAL and PLA.

UNIT IV  SYNCHRONOUS SEQUENTIAL LOGIC  10


UNIT V  ASYNCHRONOUS SEQUENTIAL LOGIC  9


TOTAL: 45 Periods
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply simplification techniques to implement Boolean expression.
- Illustrate the design of combinational circuits for arithmetic operations and code conversions.
- Design memory devices using MSI.
- Analyze and design synchronous sequential digital circuits.
- Minimize the states and flow tables in designing asynchronous sequential circuits.

TEXT BOOKS:

REFERENCE BOOKS:
15UIT209 PROBLEM SOLVING AND PROGRAMMING TECHNIQUES L T P C
3 0 0 3

PRE-REQUISITES:

COURSE OBJECTIVE:
- To explain the basic concepts of programming Paradigms
- To Summarize the Various Storage Classes
- To impart Knowledge in input and Output
- To demonstrate the systematic way of solving problems

UNIT I FUNCTIONS AND PROGRAM STRUCTURE

UNIT II STORAGE MANAGEMENT
Storage Classes – Storage Class specifier – Structures – Basics of Structures – Structures and Functions – Array of Structures – Pointers to Structures

UNIT III POINTERS AND ARRAYS
Pointers and Addresses – Pointers and Function Arguments – Pointers and Arrays – Character Pointers and Functions – Pointer Arrays – Pointers to Pointers – Pointers Functions

UNIT IV INPUT AND OUTPUT

UNIT V SORTING AND SEARCHING

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the Knowledge of fundamental programming concepts in developing functions, to solve simple problems.
- Apply the knowledge in various storage classes and structures to develop solutions.
- Apply the knowledge of pointers and Arrays to develop solutions.
- Apply the knowledge in file handling techniques to store and retrieve data.
- Identify, formulate and analyze searching & sorting techniques.

TEXT BOOK:

REFERENCE BOOK
PHYSICS LABORATORY
(COMMON TO CSE,ECE,EEE,IT,BIOMEDICAL)

COURSE OBJECTIVE:

- To introduce the experimental procedure for the Band gap of a semiconductor, B-H curve and Potentiometer.
- To demonstrate the working of Spectrometer and Lee’s Disc apparatus.

LIST OF EXPERIMENTS

1. Laser – Determination of numerical aperture and acceptance angle of an optical fibre.
2. Carey Foster’s Bridge – Determination of specific resistance of the given coil.
5. B-H curve - Study of Hysteresis Loop
6. Determination of Band gap of a semiconductor.

- A minimum of FIVE experiments shall be offered

COURSE OUTCOMES:

After the successful completion of this course, student shall be able to
- Analyze the thermal conductivities of bad conductors and also the properties of semiconductors.
- To know the elastic properties of materials using uniform & non-uniform bending method of young’s modulus.
- Understand the theory behind the signal communication through laser in optical fiber.

CHEMISTRY LABORATORY

COURSE OBJECTIVE:

- Apply the theoretical concepts to perform lab experiments.
- To asses the water quality parameters.
- To acquire knowledge on water quality parameters for the analysis of industrial effluents.

LIST OF EXPERIMENTS
(Common to All Branches)

- Estimation of hardness of water by EDTA method.
- Estimation of alkalinity of water sample.
- Estimation of Chloride in water sample (Argentometric method )
- Determination of DO in water
- Estimation of silver ion by Dichrometry
- Determination of quality of Surface water (River/pond/lake) and Ground water (well/bore well) with respect to Hardness, TDS, Chloride and pH.
- Determination of acidity of industrial effluents.

**COURSE OUTCOMES:**
At the end of the course, the student will able to
- Analyse the properties of water by applying the chemical concepts.
- Determine the amount of acid in the industrial effluents.
- Use specific methods to analyse the Dissolved oxygen in water.

A minimum of FIVE experiments shall be offered

**TOTAL: 30 PERIODS**
COURSE OBJECTIVES:

- To demonstrate the systematic way of solving problems using C.

LIST OF EXPERIMENTS:

1. Implement Function Using Scope Variables
2. Implement Recursions
3. Implement the Concept of C Pre Processor
4. Implements Programs Using Structure
5. Implements Programs Using Structure Pointers
6. Implements Programs Using Array of Structure
7. Implements Programs Using Pointers to Structures
8. Implements Programs Using Pointers and Functions
9. Implements Programs Using Pointers to Pointers
10. Implements Programs Using Sequential File Operations
11. Implements Programs Using Random File Operations
12. Implements Programs Using Command Line Arguments
13. Implements Bubble Sort, Insertion Sort and Selection Sort
14. Implement Quick Sort, Merge Sort and Heap Sort
15. Implement Programs Using Searching Techniques.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

- Apply the knowledge in function, recursion and preprocessor to solve the suitable applications
- Apply the knowledge in types of structure to solve record processing applications
- Apply the knowledge in dynamic memory allocation to solve application using pointers
- Apply the knowledge in types of files to solve file handling applications
- Identify, analyze and resolve the issue in arranging data using various types of sorting and searching techniques.

HARDWARE AND SOFTWARE REQUIREMENTS

Computer Required: 30 no’s
Minimum requirements: Processor: Pentium IV, Ram: 1GB, Hard Disk: 80GB

Software Requirements:
Linux (Ubuntu/Fedoral/Debian/Mintos)/ windows
Turbo C version 3
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Total No. of Credits – 22
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 + 6


UNIT II  TWO DIMENSIONAL RANDOM VARIABLES  9 + 6

Joint probability distributions - Marginal and Conditional distributions – Covariance - Correlation and Regression - Transformation of random variables - Central limit theorem.

UNIT III  DESIGN OF EXPERIMENTS  9 + 6

Completely Randomized Design – Randomized Block Design – Latin Square Design.

UNIT IV  QUEUING THEORY  9 + 6

Definitions – Basic terms of Queueing theory - 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 + 6

M/G/1 Queue - Pollaczek- Khintchine formula. Series Queues - Open and Closed Jackson networks.

TOTAL: 45 (L) + 30 (T) = 75 Periods
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to

- Apply the acquired knowledge of standard distributions in real life phenomena.
- Find the relationship involving more than one random variable and analyze the functions.
- 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.
- Apply basic probability techniques and models to analyze the performance of systems.

TEXT BOOKS:
5. Williams Menden kall, Robert J. Beaver, Barbara M. Beaver “Probability Statistics”, college learning 2013 14th Edison, New Delhi

REFERENCE BOOKS:
PRE-REQUISITES: 15UIT209 PROBLEM SOLVING AND PROGRAMMING TECHNIQUES

COURSE OBJECTIVE:

- To efficiently implement the different data structures
- To learn linear data structures – list, stack, and queue.
- To be exposed to the concepts of Trees
- To learn the systematic way of solving problems
- To acquire knowledge from non-linear data structures – graph

UNIT I  LINEAR STRUCTURES  10
Abstract Data Types (ADT) – List ADT – Array implementation of Lists – Linked lists - Doubly Linked Lists – Stack ADT - Applications of Stack - Queue ADT - Applications of Queue.

UNIT II  TREE STRUCTURES  8
Tree ADT – Tree traversals – Applications - Binary Tree ADT – Expression tree - Binary search tree ADT.

UNIT III  BALANCED TREE  9
AVL Trees – Splay Trees – B-Tree - heaps – Priority Queues- Binary heap – Applications of Priority Queues.

UNIT IV  HASHING AND SET  9

UNIT V  GRAPHS  9
Definitions – Topological sort – Shortest path algorithms – Minimum spanning tree – Prim’s and Kruskal's algorithms – Breadth First Search – Depth First Search – Applications of DFS-Biconnectivity – Euler circuits

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After successful completion of this course the students 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.
TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To familiarize the components of computer system and Instructions.
- To discuss in detail the operation of the arithmetic unit.
- To explain the concept of pipelining and superscalar operation.
- To give knowledge on memory and I/O systems.

UNIT I OVERVIEW AND INSTRUCTIONS 10+10
Components of a computer system - Basic Operational Concepts - operations and operands – representing instructions– Logical operations – control operations – Instruction and instruction sequencing - Addressing and addressing modes

UNIT II ARITHMETIC OPERATIONS AND PIPELINING 10+10

UNIT III MEMORY AND I/O SYSTEMS 10+10
Memory hierarchy - Memory technologies – Cache basics – Measuring and improving cache performance - Virtual memory, TLBs- Memory Management Requirements - Input/output system, DMA and interrupts, Buses.

TOTAL : 30(L)+30(T)=60 Periods

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the basic components of a computer, including CPU, memories and input/output and their organization
- Apply the arithmetic operations of binary number system.
- Design a pipeline for consistent execution of instructions with minimum hazards
- Adapt a wide variety of memory technologies both internal and external

TEXT BOOKS:
REFERENCE BOOKS:

PRE-REQUISITES: 15UCS107 COMPUTER PROGRAMMING

COURSE OBJECTIVE:
- To understand the basic concepts of OOPs, benefits of OOPs and applications of OOPs
- To solve various problems using various OOPs features in C++
- To describe Templates for time conventional programming
- To work with File Systems and exception handlings

UNIT I  INTRODUCTION

UNIT II  CLASSES AND OBJECTS
Classes and Objects – Passing objects as arguments – returning objects – Friend functions – Static data and member functions – Constructors – Parameterized constructor – Destructor – Copy constructor – Array of objects – pointer to object members.

UNIT III  POLYMORPHISM AND INHERITANCE

UNIT IV  VIRTUAL FUNCTIONS AND TEMPLATES

UNIT V  FILES AND EXCEPTION HANDLING

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to

- Compare the merits and demerits of object oriented programming over the structure programming
- Develop solutions to a given problems using class object concepts
- Make use of overloading and inheritance concepts to solve real world problems
- Apply virtual and template concepts in a given problem
- Experiment with C++ streams and file manipulations

TEXT BOOKS:

REFERENCE BOOKS
OPERATING SYSTEMS
(Common to CSE and IT)

L T P C
3 0 0 3

PRE-REQUISITES:

COURSE OBJECTIVE:
• To have an overview of different types of operation systems
• To study about process management
• To have a thorough knowledge of deadlock and memory management
• To know file sharing and virtual memory
• To learn the basic concepts of I/O and file systems

UNIT I
INTRODUCTION
9
Introduction: Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed
System Components – Operating System Services – System Calls – System Programs – Process
Concept – Process Scheduling – Operations on Processes – Cooperating Processes

UNIT II
PROCESS MANAGEMENT
9
Threads: Overview – Threading issues – CPU Scheduling: Basic Concepts – Scheduling Criteria –
Hardware – Semaphores – Classic problems of Synchronization – Critical regions – Monitors.

UNIT III
DEADLOCK AND MEMORY MANAGEMENT
9
System Model – Deadlock Characterization – Methods for handling Deadlocks – Deadlock
Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks – storage
Management: Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation
with Paging.

UNIT IV
VIRTUAL MEMORY AND FILE SHARING INTERFACE
9
Virtual Memory: Demand Paging – Process Creation – Page Replacement – Allocation of frames –

UNIT V
FILE SYSTEM STRUCTURE AND STORAGE STRUCTURE
9

TOTAL: 45 PERIODS
COURSE OUTCOMES:
- Apply different types of operating systems
- Apply the suitable algorithms, to overcome the problem occurred in process management.
- Identify deadlock and memory management problems for real time application.
- Apply the knowledge of virtual memory concept to solve the related problems in relevant applications.
- Make use of file management concepts to retrieve the file for suitable applications.

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES: 15UCS208 DIGITAL PRINCIPLES AND SYSTEM DESIGN

COURSE OBJECTIVE:

- To introduce the concepts of various analog modulations and their spectral characteristics
- To know the principles of sampling & quantization
- To study the various waveform coding schemes
- To create awareness on the basic communications systems, particularly with application to noise-free analog and digital communications.

UNIT I  ANALOG COMMUNICATION

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

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  DIGITAL TRANSMISSION


UNIT IV  SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES

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.

UNIT V  ERROR CONTROL CODING

Error Control Coding, linear block codes, cyclic codes, convolution codes, Viterbi decoding algorithm

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the knowledge of various analog modulation techniques to identify voltage and power distribution.
- Compare various digital communication techniques to transmit digital data in high frequency radio transmission.
- Identify and apply the digital audio video recording and broadcasting technologies using pulse code modulation.
- Compare various multiple access techniques to provide better capacity for voice and data communications.
- Apply the knowledge of various error control coding techniques to control the occurrences of errors.

TEXT BOOKS

REFERENCE BOOKS
COURSE OBJECTIVES:
- To demonstrate the basic concepts of Object Oriented Programming
- To demonstrate Operator overloading and exception handling concepts
- To demonstrate various file operations in C++

LIST OF EXPERIMENTS
1. Implement Simple C++ Programs
2. Implement Programs using functions
3. Implement Programs using classes
4. Implement Programs to demonstrate Constructor overloading
5. Implement Programs to demonstrate Function overloading
6. Implement Programs to demonstrate Operator overloading
7. Implement Programs to demonstrate Inheritance
8. Implement Programs to demonstrate Polymorphism and Virtual functions
9. Implement a Program for finding the minimum value contained in an array using function templates
10. Implement a Program to represent a stack and Queue data structure using class template
11. Write a program to apply File Handling and I/O Manipulation techniques for a given problem
12. Write a program to apply Exception handling methods for a given problem

TOTAL: 30 PERIODS

COURSE OUTCOMES
After the successful completion of this course, the student will be able to
- Make use of object oriented programming concepts
- Make use of operator and function overloading in C++
- Experiment with inheritance and Polymorphism
- Develop programs using the template concepts
- Apply file and exception handling methods in a given problem

HARDWARE AND SOFTWARE REQUIREMENTS
Computer Required: 30 No’s
Minimum Requirement: Processor: Pentium IV, Ram: 1GB, Hard Disk: 80 GB

Software Requirements:
- Operating System: Linux (Ubuntu / Fedora / Debian / MinOS) / Windows
- Turbo C Version 3 or GCC Version/ Built in Linux/ DEVC++
COURSE OBJECTIVES:
- To demonstrate the systematic way of solving problems using linear and non-linear data structures
- To demonstrate the hashing techniques
- To demonstrate the algorithms using graphs

LIST OF EXPERIMENTS
1. Implement singly linked lists
2. Implement doubly linked lists
3. Implement stack ADT using array and linked list
4. Implement stack and use it to convert infix to postfix expression
5. Implement queue ADT use array and linked list
6. Implement an expression tree. Produce its pre-order, and post-order traversals
7. Implement binary search tree
8. Implement insertion and deletion in AVL trees
9. Implement priority queue using binary heaps
10. Implement hashing with open addressing
11. Implement Prim’s algorithm using priority queues to find MST of an undirected graph

COURSE OUTCOMES:
After the successful completion of the course, the students will be able to
- Apply the knowledge in types of linked lists and dynamic memory allocation to develop solutions for various operations in linked lists
- Apply the knowledge in stack and queue to implement various operations using array and linked list
- Develop solutions for implementing various tree structures like expression tree, binary search tree, AVL tree and binary heap.
- Develop solutions for resolving issues associated with arranging data in hashing using open addressing.
- Design solution for real world complex engineering problems like finding minimum spanning tree shortest path problem.

HARDWARE AND SOFTWARE REQUIREMENTS
Computer Required: 30 No’s
Minimum Requirement: Processor: Pentium IV, Ram: 1GB, Hard Disk: 80GB
Software requirements:
Operating System: Linux(Ubuntu / Fedora / Debian / Mint OS) / Windows
Turbo C Version 3 or GCC Version 4 / Built in Linux / DEVC++
COURSE OBJECTIVES:
- To demonstrate process management and CPU scheduling concepts
- To demonstrate memory management schemes
- To demonstrate disk scheduling

LIST OF EXPERIMENTS
1. Development of routines for inter process communication
2. Process creation and management
3. Simulation of CPU scheduling algorithms I
4. Simulation of CPU scheduling algorithms II
5. Simulation of Producer-consumer problem using semaphores
6. Implementation of deadlock avoidance and prevention algorithms
7. Implementation of memory management scheme I
8. Implementation of memory management scheme II
9. Implementation of Page replacement algorithms
10. Analysis of file allocation algorithms
11. Working with file system commands
12. Simulation of disk scheduling algorithms

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After the successful completion of the course, the students will be able to
- Apply the knowledge of operating systems structures and functions in system engineering
- Apply the suitable algorithms for various problems related to process management
- Identify, formulate and analyze complex deadlock problems for better memory management techniques
- Analyze the possibilities of memory extensions using virtual memory in the modern computing environment
- Apply the knowledge of file management concepts in the design of operating systems.

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 4 / Built in Linux / DEVC++
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Total No. of Credits – 23
**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**


**UNIT II COMBINATORICS**

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

**UNIT III GRAPHS**

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**

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**


**TOTAL :** 45 (L) + 30 (T) = 75 Periods
COURSE OUTCOMES:

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

- Apply the acquired knowledge of the concepts needed to test the logic of the program.
- Synthesize induction hypotheses and simple induction proofs which is a very important tool in computer science engineering.
- Identify the basic properties of graphs, trees and use these concepts to model simple applications.
- Analyze the structures on many levels.
- Apply the acquired knowledge of partial order, Lattices and Boolean algebra which play an important role in many disciplines of computer science.

TEXT BOOKS:


REFERENCE BOOKS:

5. SENGADIR.T “Discrete Mathematics and Combinatorics”, first imprision (2009), Pearson education , New Delhi
PRE-REQUISITE: COMPUTER PROGRAMMING

COURSE OBJECTIVES:
- To explain Java fundamentals.
- To introduce generic programming and exception handling mechanism.
- To impart knowledge in i/o and file systems.
- To learn the basic concepts of collections and GUI programming.

UNIT I  JAVA FUNDAMENTALS  9


UNIT II  INHERITANCE AND INTERFACES  9


UNIT III  EXCEPTION HANDLING AND GENERIC PROGRAMMING  9


UNIT IV  COLLECTIONS AND I/O  9


UNIT V  GUI PROGRAMMING WITH SWING  9


TOTAL: 45 Periods
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the concept of classes and objects in java to provide solutions to real world scenarios.
- Apply inheritance and abstraction in java object model to design components to engineering problems.
- Develop generic solutions to computing problems and apply exception handling mechanism to the solutions.
- Use collection framework to process data available in files and other resources to provide solutions to computing problems.
- Design graphical user interfaces to interact with solutions of health, public, environment and governance domains.

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To introduce the fundamentals of user interface design
- To provide concepts and guidelines of user interface
- To identify the impact of HCI, formulate and solve user interface issues.

UNIT I INTRODUCTION 8

UNIT II HUMAN COMPUTER INTERFACE DESIGN PROCESS 10

UNIT III WINDOWS CHARACTERISTICS 9

UNIT IV GUIDELINES AND FEEDBACK 9

UNIT V WINDOWS LAYOUT 9

TOTAL: 45 PERIODS
COURSE OUTCOMES:
- Apply the knowledge of user interface and design principles to design any web application.
- Design the interface 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 design issues in web designs.

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- Understand the phases in a software project
- Understand fundamental concepts of requirements engineering and Analysis Modeling
- Understand the major considerations for enterprise integration and deployment
- Learn various testing and maintenance measures

UNIT I SOFTWARE PROCESS


UNIT II REQUIREMENTS ANALYSIS AND SPECIFICATION


UNIT III SOFTWARE DESIGN


UNIT IV TESTING AND IMPLEMENTATION


UNIT V PROJECT MANAGEMENT


TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Demonstrate the current models and techniques for the software life cycle.
- Identify the requirement 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 & risk management for software projects.

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand basic ideas of databases system design
- To understand the Logical and Physical aspects of the DBMS architecture
- To understand the Normal forms
- To understand and apply the Transaction and Recovery controls
- To understand and apply databases storage techniques

UNIT I  INTRODUCTION  9

Purpose of Database System - Views of data - Data Models - Database Languages - Database System Architecture - Database users and Administrator - Entity - Relationship Model (E-R model)-E-R Diagrams -- Introduction to relational databases, Case Study: E-R Diagram for an University.

UNIT II  RELATIONAL MODEL  9


UNIT III  DATABASE DESIGN  9


UNIT IV  TRANSACTIONS  9


UNIT V  IMPLEMENTATION TECHNIQUES  9


TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the students will be able to
- Apply the knowledge of database systems to construct an E-R Model for any application
- Design a DBMS for an application using relational models.
- Select and apply appropriate techniques to develop a normalized database
- Apply the knowledge of SQL techniques for recovery and concurrency
- Analyze the various storage techniques to improve the query processing

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To introduce the functions of different layers
- To familiarize the network topologies and protocols
- To learn flow control and congestion control algorithm
- To explain IEEE standard employed in computer networking

UNIT I  INTRODUCTION TO NETWORKS  9

UNIT II  DATA LINK LAYER  9

UNIT III  NETWORK LAYER  9

UNIT IV  TRANSPORT LAYER  9

UNIT V  APPLICATION LAYER  9

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to

- Apply the knowledge of computer and communication fundamentals in topologies and physical Layer
- Identify and analyze the complex problems in data link layer
- Conduct investigation of networking routing problems and provide solutions by applying the routing algorithms
- Apply the knowledge of transport layer protocols to improve QOS in computer networks
- Apply the knowledge of various protocols to assess societal, safety, and legal issues

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- 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 8

UNIT II VERBAL AND NON VERBAL REASONING 7

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

WEBSITES:
TEXT BOOKS

REFERENCE BOOKS:
PRE-REQUISITE:

COURSE OBJECTIVES:
- To demonstrate various features of Java.

LIST OF EXPERIMENTS
1. Write a java program to illustrate constructors.
2. Write a java program to demonstrate arrays and strings.
3. Write a java program to implement inheritance
4. Write a java program to demonstrate interface.
5. Write a java program to illustrate exception handling.
6. Write a java program to demonstrate generic programming
7. Write a java program to use collection.
8. Write a java program to perform File I/O.
9. Write a java program to design a Form with menus using Swing.
10. Write a java program to demonstrate Dialogs.

TOTAL: 30 Periods

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Develop computer applied solutions using Constructor, Arrays and Strings
- Design solutions for real world problems based on Inheritance
- Apply the knowledge of exception handling and generic programming in solutions to engineering problems
- Design solutions for environmental and societal problems using collections and file IO
- Design GUI interfaces for solutions to computing problems.

SOFTWARE AND HARDWARE REQUIREMENT

Hardware Requirement:
Personal Computers – 30 Nos.

Software Requirement:
Notepad/Notepad++/any other equivalent, Windows/Linux OS, JDK 1.4 or Higher versions, MySQL / Equivalent Database Management System, IDEs (optional)
COURSE OBJECTIVES:
- To design a database
- To familiarize with a query language
- To develop various 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 various integrity constraints
4. Implement High-Level Language extension with Cursors
5. Implement High-Level Language extension with Triggers
6. Implement Procedures and Functions
7. Implement embedded SQL
8. Implement database design using E-R Model and Normalization
9. Design and implementation of Payroll Processing System.
10. Design and implementation of Banking System
11. Design and implementation of Library Information System
12. Design and implementation of Online Test.

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After 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 database
- Design a solution for PL/SQL queries using function, cursors and triggers
- Analyze the redundancy in database
- Apply the knowledge of database connectivity for an application

HARDWARE AND SOFTWARE REQUIREMENTS:
Hardware Requirements:
Computer Required: 30 No’s
Minimum Requirement: Processor: Pentium IV, RAM: 1 GB, Hard Disk: 80GB

Software Requirements:
Front end: VB/VC ++/Java
Back end: Oracle 11g, MYSQL, DB2 Platform
Platform: Windows 2000 Professional/XP
Oracle server could be loaded and can be connected from individual PCs.
COURSE OBJECTIVES:

- To Understand the core concepts of networking and equips them to effectively troubleshoot and manage real – world network infrastructures.
- To be familiar with Simulation tools
- To examine the performance of the token ring network under different scenarios.
- To demonstrate the basics of designing a network, taking into consideration the users, services, and locations of the hosts.
- To examine the effect of ATM adaptation layers and service classes on the performance of the network.
- To configure and analyze the performance of the Routing Information Protocol (RIP) model.
- To demonstrate the congestion control algorithms implemented by the Transmission Control Protocol (TCP).
- To examine the effect of different queueing disciplines on packet delivery and delay for different services.
- To study the role of firewalls and Virtual Private Networks (VPNs) in providing security to shared public networks such as the Internet.
- To analyze the performance of an Internet application protocol and its relation to the underlying network protocols.

List of Experiments

1. Introduction (Basics of OPNET IT Guru Academic Edition)
2. Ethernet (A Direct Link Network with Media Access Control)
3. Token Ring (A Shared – Media Network with Media Access Control)
4. Switched LANs (A Set of Local Area Networks Interconnected by Switches)
5. Network Design (Planning a Network with Different Users, Hosts, and services)
6. ATM (A Connection – Oriented, Cell – Switching Technology)
7. RIP: Routing Information Protocol (A Routing Protocol based on the distance vector algorithm)
8. OSPF: Open Shortest Path First (A Routing Protocol based on the distance Link – State Algorithm)
9. TCP: Transmission Control Protocol (A Reliable, Connection – Oriented, Byte-stream Service)
10. Queuing Disciplines (Order of Packet Transmission and Dropping)
11. RSVP: Resource Reservation Protocol Providing QoS by reserving Resources in the Network
12. Firewalls and VPN (Network Security and Virtual Private Networks)
13. Application (Network Application Performance Analysis)

TOTAL: 30 PERIODS
COURSE OUTCOMES:
After successful Completion of this course, the student will be able to

- Apply the basic Knowledge of networking to analyze the flow of data and identify the Topology
- Design a local area networks connected by various switches and hubs
- To configure and analyze the performance of the Routing Information Protocol (RIP) Model
- Analyze the performance of the congestion control algorithms implemented by the Transmission Control Protocol TCP
- Apply the role of firewalls and Virtual Private Networks (VPNs) in Providing Security to shared public networks such as the Internet.

HARDWARE AND SOFTWARE REQUIREMENTS:
Hardware Requirements:
Computers Required: 30Nos.

Software Requirements:
C, C++, J2SDK(Freeware), Network Simulator, NS2/ Glomosim/OPNET/RIVERBED (Freeware)
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**Total No. of credits – 22**
PRE-REQUISITES:

COURSE OBJECTIVE:
- To introduce the various protocols and technologies behind internet
- To impart designing web sites
- To develop interactive web pages
- To write programs for server side

UNIT I  INTERNETWORKING AND HTML  9

UNIT II  CSS AND HTML5  9

UNIT III  JAVASCRIPT AND DOM  9

UNIT IV  PHP  9
PHP: Server-Side Basics - PHP Basic Syntax - Arrays - Strings–Functions - Forms: Form Basics - Form Controls - Submitting Data - Processing Form Data In PHP - Querying a database in PHP: connecting to a database performing queries.

UNIT V  AJAX AND XML  9

TOTAL: 45 PERIODS
COURSE OUTCOMES:

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

- Design web pages using HTML.
- Make stylistic decisions with CSS and HTML5.
- Create interactive websites with JavaScript and DOM.
- Use PHP for server side programming.
- Enhance interactive websites with AJAX and XML.

TEXT BOOKS:


REFERENCE BOOKS:

PRE-REQUISITES:

COURSE OBJECTIVE:

- To familiarize the concepts of data warehousing
- To introduce the fundamentals of data mining and its functionalities
- To familiarize knowledge in different data mining techniques and algorithms
- To review various application domains of data mining

UNIT I DATA WAREHOUSING


UNIT II DATA MINING


UNIT III ASSOCIATION RULE MINING AND CLASSIFICATION

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

UNIT V  ADVANCED MINING


TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Identify and analyze appropriate data warehousing techniques for an engineering problem.
- 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:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To impart the concept of output primitives, 2D Transformations and clipping algorithms.
- To instruct the basics of 3D object representation, viewing and its transformation.
- To introduce the concept of color models and applications of animation.
- To illustrate the concept of fractal and self-similarity objects
- To impart the fundamentals of Multimedia and its compression technique
- To instruct the basics of multimedia communication system and its applications

UNIT I 2D TRANSFORMATION

UNIT II 3D TRANSFORMATIONS AND VIEWING
Three Dimensional Concepts – Three -Dimensional object representations Polygons, Curved lines, Splines, Quadric Surfaces – Visualization of data sets – Three-Dimensional geometric and modeling transformations – Three-Dimensional viewing – visible surface detection

UNIT III COLOR MODELS & SELF SIMILARITY CURVES
Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Raster, Key frame, Introduction to Shading models – Flat and Smooth shading – Adding texture of faces – Fractals and Self similarity – Mandelbrot sets

UNIT IV MULTIMEDIA COMPRESSION

UNIT V MULTIMEDIA SYSTEMS AND APPLICATIONS

TOTAL: 45 PERIODS
COURSE OUTCOMES:

- Apply the knowledge of two dimensional transformation and clipping algorithm to draw output primitives
- Apply knowledge of three dimensional transformations to represent & viewing of objects
- Describe the concept of color models & principles of shading models.
- Implement compression technique using multimedia concepts
- Develop the multimedia application like video conferencing, virtual Reality

TEXT BOOKS:


REFERENCE BOOKS:

PRE-REQUISITES:

COURSE OBJECTIVE:
- To analyze a problem and identify the computing requirements appropriate for its solutions
- To summarize sorting, searching algorithms and report algorithm design methods
- To become familiar with the different algorithm design techniques

UNIT I INTRODUCTION

UNIT II SEARCHING AND TRAVERSAL TECHNIQUES

UNIT III ALGORITHMIC TECHNIQUES

UNIT IV BACKTRACKING AND BRANCH AND BOUND

UNIT V COMPUTATIONAL COMPLEXITY AND PARALLEL ALGORITHMS

TOTAL: 45 PERIODS
COURSE OUTCOMES:

- Analyze the fundamentals of algorithm performance by using probabilistic, amortized and mathematical analysis
- Apply brute force, and divide and conquer strategies for sorting, searching and non linear traversal problems
- Apply dynamic programming and greedy strategies to solve shortest path problems
- Apply backtracking and branch and bound strategies to solve complex engineering problems
- Apply the Knowledge of non-deterministic algorithms to solve P, NP, NP complete and NP hard problems.
- Apply the knowledge in parallel computing models to solve pointer doubling algorithm

TEXT BOOKS


REFERENCE BOOKS:

PRE-REQUISITES:

COURSE OBJECTIVE:
- To design web pages
- To develop interactive web pages
- To process client requests through server scripts

LIST OF EXPERIMENTS
1. Create a web page using HTML and CSS
2. Validate a webpage using Java Script.
3. Demonstrate manipulation of DOM objects of a web page
4. Design a web form and process data while maintaining session using PHP
5. Handle database using PHP
6. Exchange data using XML in AJAX application
7. Manipulate data using XSLT in AJAX application
8. Mini Project (Minimum 3 Sessions or 10 Hours should be allocated).

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Design web pages using HTML and CSS
- Manipulate web pages using JavaScript and DOM
- Process client requests and generate web based responses
- Exchange and Manipulate XML data in AJAX applications
- Create and deploy web applications

HARDWARE/SOFTWARE REQUIREMENTS

Hardware
- Pentium P4, 2.8 GHz of higher
- 512MB (or higher) RAM
- 40 GB (or higher) HD;
- Windows XP with SP2 (or higher)

Software:
- XAMPP
- Notepad++
PRE-REQUISITES:

COURSE OBJECTIVE:
- To familiar with the algorithms of data mining
- To aware with the tools and techniques used for Knowledge Discovery in Databases
- To expose with the web mining and text mining

LIST OF EXPERIMENTS
1. Design and implement a Data Warehouse,
   i. Identify source tables and populate sample data.
   ii. Create the dimension table and fact table in the data warehouse
   iii. Design multi-dimensional data models namely Star, Snowflake and Fact Constellation schemas for any one enterprise (ex. Banking, Insurance, Finance, Healthcare, manufacturing, Automobiles, sales etc.).
2. Explore WEKA Data Mining/Machine Learning Toolkit
   i. Downloading and/or installation of WEKA data mining toolkit.
   ii. Understand the features of WEKA tool kit such as Explorer, Knowledge flow interface, Experimenter, command – line interface.
   iii. Navigate the options available in the WEKA (ex. Select attributes panel, Preprocess panel, classify panel, cluster panel, associate panel and visualize)
   iv. Study the ARFF file format
   v. Explore the available data sets in WEKA
   vi. Load a data set (ex. Weather dataset, Iris dataset, etc.)
5. Implementation of Bayesian Classification.
6. Implementation of Decision Tree, If-Then Rule.
8. Implementation of Support Vector Machines and Regression.

TOTAL: 30 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to

- Apply the knowledge of SQL to Create Data Warehouses
- Apply the Knowledge of data mining tasks using a data mining tool kit.
- Apply the association rule mining in Weka tool to predict the relationship among the values of attributes.
- Analyze the performance of various classification algorithms.
- Apply the knowledge of clustering algorithms on different datasets.

HARDWARE AND SOFTWARE REQUIREMENTS:

Hardware Requirements:
1. Computer Required: 30 No’s

Software Requirements:
1. Windows, WEKA, RapidMiner, DBMiner or Equivalent
COURSE OBJECTIVES

- To demonstrate the 2D, 3D and geometric transformation
- To review graphics programming with OpenGL
- To familiarize with implementation of multimedia applications

List of experiments

1. Implementation of Line drawing Algorithm
2. Implementation of 2D Transformations, 2D Viewing and Clipping
3. Implementation of 3D Transformations
4. Implementation of color models (RGB, YIQ)
5. Generating Fractal images
6. Draw at least four basic graphics primitives using OpenGL
7. Draw 3D objects and scenes using OpenGL
8. Implementation of text compression algorithm using RLE and Static Huffman
9. Implement image compression using Huffman algorithm
10. Perform animation using any Animation software (Macromedia Flash, Blender, CreaTo, etc)

TOTAL: 30 PERIODS

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

- Make use of graphics primitives and 2D transformation and clipping
- Make use of 3D concepts to produce realistic display
- Implement OpenGL programming concepts to create interactive computer graphics
- Apply compression techniques on images
- Develop the Multimedia applications

SOFTWARE AND HARDWARE REQUIREMENT

Hardware: Standalone desktops - 30 Nos. OR Server supporting 30 terminals or more
Software: C/C++, OpenGL 3.7 (precompiled GLUT libraries 3.7 - Open source), Any open source software like GIMP 2.6/Flash 8.0/Adobe Photoshop/Blender 2.5
SOFTSKILLS AND COMMUNICATION LABORATORY
(CSE,EEE, IT,ECE)

L T P C
0 0 2 1

PRE-REQUISITES:

COURSE OBJECTIVE:
- To develop a requisite knowledge in communication skills and soft skills.
- To enhance the students’ acumen in sharpening the skills to meet the global challenges and industrial needs

UNIT I
Communication – Types of communication – Communication network – Communication Techniques - Barriers of Communication.

UNIT II

UNIT III

UNIT IV

UNIT V
Body Language – Types of Interview: Online interview, Mock Interview, Telephonic interview – GD - Presentation.

TOTAL: 30(L) = 30 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the students will be able to:
- Present ideas and in a flexible manner and differentiate & eliminate the ambiguity
- Write well-structured and easily readable reports, e-mails and articles on complex topics in an appropriate style
- Comprehend any address in English face to face and through different media like telephone and public announcement

REFERENCE BOOKS:
1. Allan Pease, Body Language, New Delhi, Sudha Publications (P) Ltd, 2005
### Semester VI

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Total No. of credits – 23
PRE-REQUISITES:

COURSE OBJECTIVE:
- To familiarize the symmetric and asymmetric encryption algorithms
- To explain the authentication and Hash function 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


UNIT III HASH FUNCTIONS AND PUBLIC KEY CRYPTOGRAPHY


UNIT IV AUTHENTICATION APPLICATIONS


UNIT V SYSTEM SECURITY


TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student 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:
MOBILE APPLICATIONS DEVELOPMENT
COMMON TO CSE AND IT

PRE-REQUISITES:

COURSE OBJECTIVE:
- To understand the essentials of mobile apps development
- To understand the fundamental concept of designing and developing
- To learn the major considerations of graphics and multimedia.
- To learn the various testing process.

UNIT I  GETTING STARTED WITH MOBILE APPS  7

UNIT II  ELEMENTS OF DESIGNS  10
Understanding Android Application and Activity Lifecycles, Handling Android Activity State Changes with examples, Saving and Restoring the State of an Android Activity, Understanding Android Views, View Groups and Layouts, Android Table Layout and Table Row Tutorial Designing a User Interface using the Android Studio Designer Tool. Introduction to Android Fragments, Creating and Managing Overflow Menus on Android

UNIT III  PROGRAMMING WITH MOBILE APPS  9

UNIT IV  ADVANCED MOBILE APPS AND ANIMATION  11
An Overview of Android Intents - Android Explicit Intents - A Worked Example, Android Implicit Intents - A Worked Example, Android Broadcast Intents and Broadcast Receivers, A Basic Overview of Android Threads and Thread Handlers, An Overview of Android Started and Bound Services, Overview of Android SQLite Databases, Understanding Android Content Providers, Implementing an Android Content Provider in Android Studio
UNIT V DATA BASE CONNECTIVITY AND TESTING


TOTAL: 45 PERIODS

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

- Apply appropriate key techniques and tools for developing and maintaining mobile Applications
- Identify the user interface requirements for mobile platforms and analyze the appropriate strategies for Development and deployment
- Apply the Knowledge of advanced Java competency in mobile application development
- Identify, review and analyze the appropriate UI layout for the mobile application development
- Develop mobile apps using Android as development platform with key focus on user experience design

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To introduce the phases of operation of a computer
- To familiarize the design and implementation of a lexical analyzer and parser
- To demonstrate the code generation and optimization

UNIT I  LEXICAL ANALYSIS  
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  
Syntax Analysis - The role of the parser - Context-free grammars - Writing a Grammar - Top down 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  
Intermediate languages - Declarations - Assignment statements - Boolean expressions - Case statements - Back patching - Procedure calls

UNIT IV  CODE GENERATION  
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  

TOTAL: 45 PERIODS
COURSE OUTCOMES:

- 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:

PRE-REQUISITES:

COURSE OBJECTIVE:

- Be familiar with Network Security Concepts using classical cryptosystems
- Learn various symmetric and asymmetric security algorithms
- Demonstrate different open source tools for network security and analysis

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. Caesar Cipher
   b. Play fair Cipher
   c. Hill Cipher
   d. Vigenere Cipher
   e. Rail fence-row & column Transformation
4. Implement the following algorithms
   a. DES
   b. RSA Algorithm
   c. Diffiee-Hellman
   d. 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: 30 PERIODS
COURSE OUTCOMES:
- Apply the classical cipher techniques for Network security
- Develop the 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 REQUIREMENTS
1. Hardware: Standalone desktops -30 Nos. OR Serve supporting 30 terminals or more
2. Software: C/C++/Java or equivalent compiler, GnuPG, KF Sensor or Equivalent, Snort, Net Stumbler or Equivalent, Opnet.
PRE-REQUISITES:

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

LIST OF EXPERIMENTS:
1. Develop an android application for student registration using GUI components demonstrate the following UI layouts.
   i. Linear Layout
   ii. Relative Layout
   iii. Table Layout
2. Develop an android application to demonstrate simple event handling (Calculator application)
3. Develop an android application to demonstrate Intent and Intent filters.
4. Develop an android application customized Sending Email, Sending SMS and Phone calls using intent.
5. Develop an android application to implement a custom design Action Bar.
7. Develop an android application to demonstrate List View and Web View.
8. Develop an android application to demonstrate Broadcast receiver.
9. Develop an android application to demonstrate SQlite Database.
10. Develop a simple media player like application using service.
11. Develop an android application to demonstrate location based services.
12. Develop an android application to integrate with Facebook and Twitter.
13. Develop an android application to demonstrate the firebase features.
14. Develop a simple Remainder application.
15. Develop a customized android chat application

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Write simple programs to display various layouts
- Implement the different menu and button controls
- Construct an animation application
- Apply database connectivity for mobile application development
- Build the robust and scalable android applications

HARDWARE AND SOFTWARE REQUIREMENTS
Standalone desktops with Windows, Android or iOS or Equivalent Mobile Application Development Tools with appropriate emulators and debuggers - 30 Nos
PRE-REQUISITES:

COURSE OBJECTIVE:

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 the recent developments in information technology 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 the successful completion of this course, the student will be able to

- Review literature and analyze technical problems to provide valid conclusion
- Design/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 and communicate the technical information effectively
- Engage in lifelong learning in the context of technological change and to function effectively in a team.
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PRE-REQUISITES:

COURSE OBJECTIVE:
- 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, Limitations of CPM/PERT, Precedence Diagramming Method, constructing diagram and computations using precedence diagramming method, PERT/CPM simulation, reducing project duration.

UNIT III RESOURCES 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 successful completion of this course the students will be able to:
1. Discuss various characteristics and importance of project management
2. Use CPM and PERT network for finding minimum project duration.
3. Compare various scheduling methods
4. Justify various tools and techniques at different stages of quality management
5. Discuss financial ratios, cash flow and fund flow analysis

TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVE:

- To introduce the essentials of building fully featured applications on various cloud models.
- To familiarize the concepts of designing and developing various service models (IaaS, PaaS and SaaS) and deployment models (Public, Private and Hybrid clouds).
- To impart the knowledge of Multi-cloud management systems and business clouds.

UNIT I  OVERVIEW OF CLOUD COMPUTING  8


UNIT II  INFRASTRUCTURE AS A SERVICE  9


UNIT III  PLATFORM AS A SERVICE/SOFTWARE AS A SERVICE  10


UNIT IV  CLOUD SECURITY  9


UNIT V  MULTI-CLOUD MANAGEMENT SYSTEM AND BUSINESS CLOUDS  9

Concept of multi-cloud management, Challenges in managing heterogeneous clouds, benefits and advantages of multi-cloud management systems.

Cloud Computing in Business, Various Biz Clouds focused on industry domains (Retail, Banking and Financial sector, Life Sciences, Social networking, Telecom, Education).

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the source, the student will be able to
- Explain the concepts of Cloud Computing and the various deployment and service models of Cloud Computing.
- Apply the virtualization techniques to provide IaaS.
- Apply Aneka tools and other techniques to provide PaaS and SaaS.
- Identify issues of security concerns in Cloud Computing.
- Describe Multi-Cloud management System for various applications.

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To Understand digital image processing beyond just the fundamental or introductory level
- To choose appropriate image processing algorithms to achieve a desired result
- To properly implement such algorithms using modern computing tools such as MATLAB

UNIT I  
DIGITAL IMAGE FUNDAMENTALS  
10
Fundamentals steps in digital image processing systems, Elements of visual perception, brightness, contrast, hue, saturation, Mach band effect, Color image fundamentals – RGB, HIS models, Image sampling, Quantization, dither, Two-dimensional mathematical preliminaries, 2D transforms – DFT, DCT, KLT, SVD

UNIT II  
IMAGE ENHANCEMENT & RESTORATION  
10

UNIT III  
IMAGE SEGMENTATION AND FEATURE EXTRACTION  
10
Detection of discontinuities – Edge operators – Edge linking and boundary detection – Thresholding – Region based segmentation – Morphological watersheds – Motion segmentation – Feature extraction and analysis.

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the knowledge of enhancement techniques for an Image
- Identify complex problem for the fundamental image enhancement algorithms
- Select an appropriate techniques to reduce noise on images
- Apply the knowledge of edge detection techniques for the images
- Analyze the various segmentation algorithms for practical applications
TEXT BOOKS:

REFERENCE BOOKS:

WEB REFERENCES:
2. http://inst.eecs.berkeley.edu/~ee225b/fa12/lectures/
COURSE OBJECTIVE:

- To impart knowledge on a values-based approach and provide a method of thinking about and dealing with ethical issues in the workplace.
- To explain what a profession is and what it means to act professionally.

UNIT I  ENGINEERING ETHICS  9


UNIT II  ENGINEERING AS SOCIAL EXPERIMENTATION  10


UNIT III  GLOBAL ISSUES  11


COURSE OUTCOMES:

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

- Illustrate the basic perception of profession, professional ethics and various moral issues and uses of ethical theories
- Describe the various social issues, industrial standards, code of ethics and role of professional ethics in engineering field
- Apply ethical principles to resolve situations that arise in their professional lives and discuss about various roles of engineers in variety of global issues
TEXT BOOKS:

REFERENCE BOOKS:
MULTIDISCIPLINARY PROJECT PHASE - I

Year: 2018-2019

Theoretical Physics on Motion (6 Hours)
Newton’s laws of motion - Dynamics of particle in rectilinear and circular motion - Conservative and Non - Conservative forces - Conservation of energy - Linear momentum and Angular momentum - Collision in one and two dimensions - Euler’s Laws of Motion - Rotational energy and Rotational Inertia for simple bodies - Combined Translational and rotational motion of a rigid body on horizontal and inclined planes - Torsion of Cylinder - Simple Harmonic Motion - Differential equation of S. H. M. and its Solution - Damped and Forced vibrations.

Simulation of Static and Dynamic Bodies (15 Hours)
Geometric Modeling – Finite Element Analysis – FEA Model - Load data – Material Properties - Boundary conditions – Analysis the Result-Linear and Non-linear Analysis -FEA Softwares

Vehicle Dynamics – Dynamic analysis software — Material properties – Connecting moving parts, joints – Apply Load and Torque – Analysis of the Result –Modal Analysis- Computational Fluid Dynamics - Assembly Modeling - Crash Analysis

COMMUNICATION (6 Hours)
Case study
- Super market services
- Car to Car communication, VANET (an application of Mobile ad-hoc network)
- mHealth, mobile ad-hoc network for E-health care system, wearable and implantable sensors using an ad-hoc network

IMAGE PROCESSING (6 Hours)
Software: MATLAB, SCILAB
Case Study:
- Image guided adaptive radiation therapy. (Health Care)
- Automatic Car number plate detection.
- Counting Vehicle & Speed Measurement
- Image processing for Driver assistance system.
- Automated Traffic Surveillance system

HUMAN COMPUTER INTERACTION (12 Hours)

Sensors
Acceleration sensor, level sensors, speedometer, manifold absolute Pressure sensor (MAP), pressure sensor, throttle, position sensor, knock sensor, automobile oxygen sensor, proximity sensor, radar sensor, speed sensor, temperature sensor, torque sensor, IR sensor, smart sensor, MEMS sensors, Data acquisition system and interfacing devices.

Human Computer Interface
Text, Speech recognition and synthesis - Haptic Technology - Web markup language.

Cloud Computing and Internet of Things
Cloud computing Architecture – Services – Types of clouds – IoT – IoT to Web of Things

Artificial Intelligence
AI Fundamentals - Searching Techniques - Knowledge Representation Issues - Using Predicate Logic and Representing Knowledge as Rules - Statistical Reasoning - Important Applications

Machine Learning
Introduction to Machine Learning - Supervised Learning - Unsupervised Learning - Reinforcement Learning - Recommender Systems

Software: IBM Watson, Microsoft Azure Machine Learning, Google Cloud Prediction API, Tensor Flow, Infosys Nia, Wipro Holmes, Open CV

DATA ANALYTICS AND OPTIMIZATION (9 Hours)
Nearest Neighbor Search – Similarity preserving summaries – Locality Sensitive Hashing (LSH) for documents – LSH Families
Page Rank – Efficient Computation – Link Spam – Market Basket Model – Handling Larger Datasets in Main Memory – Counting Frequent Item sets.

Software Tools: Wega, IBM Modeler, Hadoop, R Programming

Case Study
1. Luxury Car Maker Uses Data Analytics to Build Next-Generation Vehicles (Mercedes-AMG: A Showcase for Real-Time Business Decisions)
2. Railways
3. Airlines
SOCIAL NETWORKS  (3 Hours)
Introduction - Niche social networks- Use of Social Network (Facebook, Linkedin, Amazon, Google+, Skype, Twitter) - Commonalities among social networks, Difference between social networks –Linking one social network to other. Concept of Social network throu’ available (day-to-day) network - social network data and statistics

ROBOTICS  (6 hours)
Robot anatomy- Definition, law of robotics, -Types of robots –Robot components – Specifications – Joint Link- Drive systems and End Effectors -Sensors and Machine Vision - Robot Control - Forward Kinematics- Robot transformations - Inverse Kinematics of Manipulators with 3(in 2 Dimension ) or 4(in 4 Dimension) Degree of freedom- Trajectory Planning —Robot programming languages –VAL programming -

Case Study on Virtual robotics

1. An augmented reality interface for training robotics through the web

Total Hours: 63 hours

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<td>8</td>
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COURSE OBJECTIVE:

- To demonstrate how to use Cloud Services

LIST OF EXPERIMENTS:

1. Study and Usage of Google Apps.
2. Implement Virtual OS using virtual box.
3. Simulate VM allocation algorithm using CloudSim
4. Simulate Task Scheduling algorithm using CloudSim
5. Simulate Energy-conscious model using CloudSim
6. Creation of virtual machine in VMware Online labs
7. Implement VMotion in VMware to demonstrate virtual Machine migration
8. Implement any private cloud to demonstrate Paas – Using Aneka
9. Implement any task in Salesforce to demonstrate Saas
10. Implement any application in Microsoft Azure.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

- Analyze the use of Cloud Applications
- Apply resource allocation and scheduling algorithms.
- Implement Energy-conscious model.
- Create virtual machines from available physical resources.
- Design a private cloud.

HARDWARE AND SOFTWARE REQUIREMENTS

HARDWARE: COMPUTERS REQUIRED – 30 Nos

SOFTWARE: NetBean or Eclipse, Cloudsim, Online Tools (VMware Online Labs, Microsoft Azure notebooks)
LIST OF EXPERIMENTS
1. Point processing in spatial domain
   A) Negation of an image
   B) Thresholding of an image
   C) Contrast stretching of an image
2. A. Conversion of RGB to Gray level image
   B. Conversion of RGB to HSI
3. Histogram Equalization
4. Histogram Specification
5. Filtering in spatial domain
   A) LowPass filtering
   B) HighPass filtering
   C) Median filtering
6. Edge detection using derivative filter mask
   A) Prewitt
   B) Sobel
   C) Laplacian
7. Data compression using Huffman coding
8. Filtering in frequency domain
   A) Lowpass filter
   B) Highpass filter
9. Implementation of edge operators for a real time application
10. Implementation of morphological operations

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Apply the knowledge of enhancement techniques for an Image
- Formulate the extract information from an image
- Design and simulate digital IIR and FIR filters for public health and safety considerations
- Demonstrate the edge and line detection for a real time application
- Select and apply appropriate techniques of histogram for an application

HARDWARE AND SOFTWARE REQUIREMENTS
Hardware: Computers Required: 30 Nos
Software: MATLAB9, LABVIEW, SCILAB
Semester VIII

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Total No. of Credits – 18
PRE-REQUISITES:

COURSE OBJECTIVE:
- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same
- To train the students in preparing project reports
- To prepare the students to face reviews and viva voice examination

PROJECT DESCRIPTION
- Twenty four periods per week shall be allotted in the timetable and this time shall be utilized by the students to receive the directions from the guide, on library reading, laboratory work, and computer analysis of field work as assigned by the guide and also to presenting periodical seminars on the progress made in the project.
- The aim of the project work is 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 or management project or a design problem.
- The progress of the project is evaluated based on a minimum of three reviews.

COURSE OUTCOMES:
After successful completion of this course, the students will be able to
- Identify and solve problems pertaining to Information Technology
- Develop IT based solution for real world problems
- Build the project as a Team or as an individual
- Elaborate their views in terms of preparing reports and presentation skills
- Engage in independent learning for effective implementation of the project
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COURSE OBJECTIVE:

- To develop an in-depth understanding of functional, logic, and object-oriented programming paradigms
- To understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing
- To understand the concepts of object-oriented, event driven and concurrent programming paradigms and develop skills in using these paradigms using Java

UNIT I

OBJECT-ORIENTED PROGRAMMING PARADIGM

Object oriented programming concepts - objects - classes - methods and messages - abstraction and encapsulation - inheritance class hierarchy - polymorphism - dynamic binding - final keyword - abstract classes - Object class - Reflection - interfaces - object cloning - inner classes - proxies - abstract classes - polymorphism.

UNIT II

PROGRAMMING TECHNIQUES


UNIT III

EVENT-DRIVEN PROGRAMMING


UNIT IV

GENERIC PROGRAMMING

Motivation for generic programming - generic classes - generic methods - generic code and virtual machine - inheritance and generics - reflection and generics - exceptions - exception hierarchy - throwing and catching exceptions - Stack Trace Elements - assertions - logging.

UNIT V

CONCURRENT PROGRAMMING

Multi-threaded programming - interrupting threads - thread states - thread properties - thread synchronization - thread-sage Collections - Executors - synchronizers - threads and event-driven programming.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful completion of this course, the student will be able to
- Explain the fundamentals of object oriented programming
- Make use of various types of Programming Techniques
- Make use of event driven programming concepts
- Apply multiple programming paradigms
- Design and develop logic, functional, and concurrent programs
TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- Classify machines of recognize languages
- Employ finite state machines to solve problems in computing
- Explain deterministic and non-deterministic automata
- Comprehend the hierarchy of problems arising in the computer sciences
- Use of turning machine to Recognize the language

UNIT I FUNDAMENTALS
Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic automaton and non-deterministic finite automation, transition diagrams and Language recognizers.

UNIT II REGULAR LANGUAGES
Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expression, conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets.

UNIT III CONTEXT FREE GRAMMARS

UNIT IV TURING MACHINE
Turing Machine, definition, model, design of TM, Computable function, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines. Linear bounded automata and context sensitive languages.

UNIT V COMPUTABILITY THEORY
Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR (0) grammar, decidability of problems, Universal Turing Machine, decidability of posts. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard Problems.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After successful completion of the course, the students will be able to
- Explain the core concepts in automata theory and formal languages
- Identify the power and the limitations of regular languages
- Develop simple automata, regular expressions and context-free grammars
- Make use of Turing machines modeling for simple tasks
- Analyze the efficiency of the Computability theory
TEXT BOOKS:

REFERENCE BOOKS:
15UIT903  ARTIFICIAL INTELLIGENCE AND KNOWLEDGE ENGINEERING

PRE-REQUISITES:

COURSE OBJECTIVE:
- To Study the concepts of Artificial Intelligence
- To Learn the methods of solving problems using Artificial Intelligence
- To Introduce the concepts of Expert Systems and Machine Learning

UNIT I  INTRODUCTION
Introduction - Definition - Future of Artificial Intelligence - Characteristics of Intelligent Agents - Typical Intelligent Agents - Problem solving Approach to Typical AI Problems.

UNIT II  PROBLEM SOLVING METHODS

UNIT III  KNOWLEDGE REPRESENTATION

UNIT IV  MACHINE LEARNING

UNIT V  APPLICATIONS

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain the concepts of AI methods.
- Choose appropriate AI methods to solve a given Problem.
- Identify the suitable knowledge representation for a given problem
- Apply the Machine Learning techniques.
- Develop simple applications using AI approaches.
TEXT BOOKS:

REFERENCE BOOKS:
DISTRIBUTED OPERATING SYSTEMS

15UIT904

PRE-REQUISITES:

COURSE OBJECTIVE:

- To explain the evolution, system models and design issues in distributes OS
- To import a broader sense of knowledge in synchronization and memory concepts
- To demonstrate some insight into the design of ATM networks and client server model

UNIT I  INTRODUCTION TO DISTRIBUTED SYSTEMS

Fundamentals; Distributed computing system – Evolution – system models – distributed operating systems – Design issues.

UNIT II  COMMUNICATION IN DISTRIBUTED SYSTEMS


UNIT III  SYNCHRONIZATION

Clock synchronization – Mutual exclusion – Election algorithms – dead locks, Case study; CHORUS

UNIT IV  DISTRIBUTED SHARED MEMORY AND RESOURCE MANAGEMENT


UNIT V  DISTRIBUTED FILE SYSTEM AND SECURITY


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
- Examine the synchronization related issues in distributed systems
- Make use of the concepts of distributed shared memory and resource management
- Elaborate the process in distributed file systems and security aspects
TEXT BOOKS:

REFERENCE BOOKS:
3. M.L.liu, Distributed Systems Principles and applications”, Pearson Addison Wesley, 2004
PRE-REQUISITES:

COURSE OBJECTIVE:
- To understand the basics of Internet of Things
- To get an idea of some of the application areas where Internet of Things can be applied
- To understand the middleware for Internet of Things
- To understand the concepts of Web of Things
- To understand the concepts of Cloud of Things with emphasis on Mobile cloud computing

UNIT I  INTRODUCTION

UNIT II  IOT PROTOCOLS

UNIT III  WEB OF THINGS

UNIT IV  INTEGRATION
Integrated Billing Solutions in the Internet of Things Business Models for the Internet of Things

UNIT V  APPLICATIONS
The Role of the Internet of Things for Increased Autonomy and Agility in Collaborative Production Environments Resource Management in the Internet of Things: Clustering, Synchronization and Software Agents. Applications—Smart Grid—Electrical Vehicle Charging

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge on basics of IoT to communication and security
- Analyze the basic protocols in wireless sensor network
- Able to realize the revolution of internet in mobile devices, cloud and sensor networks
- Analyze the business needs and translating the requirements into supporting architecture and models
- Integration of IoT with enterprise and user applications.
TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- 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
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
Components for embedded programs – Models of programs – Assemble, 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 PROCESS 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.

UNIT IV SYSTEM DESIGN TECHNIQUES AND NETWORKS

UNIT V CASE STUDY

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course the student will be able to
- Describe the architecture and programming of ARM process and outline the concepts of embedded systems
- Explain the basic concepts of real time Operating system design.
- Use the system design techniques to develop software for embedded systems
- Evaluate embedded solutions for solving real world problems

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:

- To learn the technical, economic and service advantages of next generation networks.
- To learn the basic architecture of a next generation network (NGN) with reference and to understand NGN services.
- To learn and compare the various methods of providing connection-oriented services over a NGN with reference to MPLS, MPLS-TE and to learn the various NGN virtual network services with reference to VPNs.
- To learn multicast, optical networks and layer 2,3, services.
- To learn the NGN management and the adaptive self healing networks.

UNIT I  INTRODUCTION


UNIT II  IMS AND CONVERGENT MANAGEMENT


UNIT III  MPLS AND VPN

Technology overview – MPLS &QoS, MPLS services and components – layer 2 VPN, layer 2 internetworking, VPN services, signaling, layer 3 VPN – Technology overview, Remote Access and IP sec integration with MPLS VPN.

UNIT IV  MULTICAST

MPLS Multicast VPN overview – Applications, examples, IPv6 and MPLS – Technology overview, Future of MPLS-Integrating IP and optical networks, Future layer 3 services, future layer 2 services.

UNIT V  NGN MANAGEMENT


TOTAL: 45 PERIODS

COURSE OUTCOMES:

After the successful Completion of the course, the student will be able to

- Illustrate the principles of IMS and convergent management in next generation networks.
- Compare various methods of providing connection – oriented services over a NGN with reference to MPLS, MPLS – TE and T-MPLS.
- Compare various NGN virtual network services with reference to VPNs, VLANs, pseudo wires, VPLS and typical applications.
- Design routing mechanism meeting the desired QoS in NGN.
TEXT BOOKS:

REFERENCE BOOKS:
15UIT908 PARADIGMS IN GREEN COMPUTING  L  T  P  C

3 0 0 3

COURSE:

PRE-REQUISITES:

COURSE OBJECTIVE:

- To acquire knowledge to adopt green computing practices to minimize negative impacts on the environment
- Skill in energy saving practices in their use of hardware
- Tools that can reduce paper waste and carbon footprint by user, and to know how to minimize equipment disposal requirements.

UNIT I  FUNDAMENTALS


UNIT II  GREEN ASSETS AND MODELING


UNIT III  GRID FRAMEWORK

Virtualizing of IT systems – Role of electric utilities, Telecommuting, teleconferencing and teleporting – Materials recycling – Best ways for green PC – Green Data center – Green grid framework.

UNIT IV  GREEN COMPLIANCE


UNIT V  CASE STUDIES

The Environmentally Responsible Business Strategies (ERBS) – Case study Scenarios for Trial Runs – Case studies – Applying Green IT Strategies and Applications to a Home, Hospital, Packaging Industry and Telecom Sector

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- Explain various issues in Green Computing
- Utilize the importance of technologies that conform to low-power computation
- Use a range of tools to help monitor and design green systems
- Choose an appropriate way to make computing greener and more efficient
- Apply the Green IT strategies and application.
TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES: 15UIT406 COMPUTER NETWORKS

COURSE OBJECTIVE:
- Know the characteristic of wireless channel
- Learn the various cellular architectures concepts
- Understand the concepts behind various digital signaling schemes for fading channels
- Be familiar with various multipath mitigation techniques
- Understand the various multiple antenna systems

UNIT I  WIRELESS CHANNELS 9

UNIT II  CELLULAR ARCHITECTURE 9

UNIT III  DIGITAL SIGNALING FOR FAADING CHANNELS 9
Structure of a wireless communication link, Principles of Offset – QPSK, p/4-DQPSK, minimum Shift Keying, Gaussian Minimum shift Keying, Error performance in fading channels, OFDM principle – Cyclic prefix, Windowing, PAPR.

UNIT IV  MULTIPATH MITIGATION TECHNIQUES 9
Equalization – Adaptive equalization, Linear and Non-Linear equalization, Zero forcing and LMS Algorithms. Diversity – Micro and Macro diversity, Diversity combining techniques, Error probability in fading channels with diversity reception, Rake receiver.

UNIT V  MULTIPLE ANTENNA TECHNIQUES 9
MIMO systems – spatial multiplexing – System model – Pre-coding – Beam forming – transmitter diversity, receiver diversity – Channel state information – capacity in fading and non-fading channels.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Classify the different fading techniques
- Choose the appropriate multiple access techniques for fading channels
- Compare multipath mitigation techniques and analyze their performance
- Design MIMO systems with transmit/receive diversity
TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVE:

- 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 type, 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:
After the successful completion of the course students will be able to
- Apply the knowledge of software engineering methodologies in the development of an enterprise application.
- Build the requirement analysis for an enterprise with consideration for public health, safety and environmental conditions
- Formulate an architectural design for a new enterprise application
- Construct and develop different solution layers with the importance of application framework and designing components
- Apply the knowledge of testing methodologies involved with enterprise application and the process of rolling out an enterprise application

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:
COURSE OBJECTIVE:
- To understand completed software testing life cycle
- To demonstrate understanding of various terms and technologies used in testing domain.
- To demonstrate understanding of usage of testing framework, process and test management

UNIT I  TESTING BASICS  8
Testing as an engineering activity-Role of process in software quality-Testing as a process- basic definitions- software testing principles- the tester’s role in a software development organization-Origins of defects- Defect classes - the defect repository and test design- Defect examples-Developer/ Tester support for developing a defect repository

UNIT II  TEST CASE DESIGN  11
Introduction to testing design strategies- The smarter tester- Test case design strategies- Using black box approach to test case design- Random testing - Equivalence class Partitioning- Boundary value analysis- other black box test design approaches- Black box testing and COTS - Using white box approach to test design- Test adequacy criteria-Coverage and control flow graphs- covering code logic- Paths - Their role in white box based test design- Additional white box test design approaches- Evaluating test adequacy criteria

UNIT III  EXECUTION OF ADEQUACY TEST  8

UNIT IV  BASICS OF AUTOMATION TESTING  9
ATLM-ATLM’s Role in the Software Testing Universe-Software Testing Careers Decision to Automate Test- Automated Test Tool Evaluation and Selection- Test Team Management

UNIT V  TESTING APPLICATIONS  9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the Successful completion of this course, the student will be able to
- Apply the knowledge of software testing principles to solve the defects in real time projects
- Apply appropriate techniques, resources and modern IT tools including prediction and modeling that develop test cases to exercise a software
- Design and conduct various types and levels of software testing for a software project that meet with realistic constraints for societal and environment considerations
- 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:
15UIT912 ADHOC AND SENSOR NETWORKS L T P C 3 0 0 3

PRE-REQUISITES: 15UIT909 WIRELESS COMMUNICATION

COURSE OBJECTIVE:
- 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 INTRODUCTION TO ADHOC NETWORKS 9

UNIT II ADHOC NETWORK ROUTING PROTOCOLS 9

UNIT III QOS AND ENERGY MANAGEMENT 9

UNIT IV INTRODUCTION TO WIRELESS SENSOR NETWORKS 9

UNIT V WSN PROTOCOLS 9

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain the concept of adhoc sensor networks and their architecture
- Analyze various routing protocol design in adhoc networks
- Compare the various energy management schemes in ad hoc networks
- Recognize the efficiency of power and energy required for adhoc sensor network
- Analyze the performance of routing protocols for sensor networks

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES: 15UIT405 DATABASE MANAGEMENT SYSTEMS

COURSE OBJECTIVE:
- To realize the importance of backup and recovery mechanisms
- To study the indexing mechanisms for organizing data
- To learn to troubleshoot database issues
- To understand the need for time series and distributed databases

UNIT I ADMINISTRATION

Introduction to network administration: Network design considerations, network responsibilities for the DBA, network configuration, Overview of oracle net features, Oracle Net Stack Architecture, Data Warehouse Administration.

UNIT II BACKUP, RECOVERY, PERFORMANCE AND SECURITY


UNIT III INDEX TUNING

Types of queries – Data structures – B tree – B+ tree – Hash structures – Bit map indexes- clustering indexes – non clustering indexes – Composite indexes – Hot tables – Comparison of indexing and hashing techniques.

UNIT IV TROUBLESHOOTING

Query plan explainers – performance monitors – Event monitors – Finding “Suspicious” Queries – Analyzing a Query’s access plan – profiling a query execution – DBMS subsystems

UNIT V CASE STUDIES


TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Build a data warehouse
- Comprehend the importance of backup and recovery mechanism
- Compare various indexing mechanism to make effective retrieval from database
- Analyze the performance of query execution
- Design a simple application using database tuning

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- 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
Agents as tools of the information society – Intelligent Software Agents – Agents in Business Area – Agents in Private Area – Definition of intelligent software agents – characteristics.

UNIT II AGENT CLASSIFICATION 9

UNIT III AGENT MODELING 10

UNIT IV AGENT COMMUNICATION 8

UNIT V APPLICATIONS OF AGENTS 10

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain the intelligent software agent and their characteristics
- Identify the appropriate agents for an application
- Develop a simple agent modeling for an application
- Illustrate various agent communication protocols
- Design Agent Base applications

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To know the design and implementation of assemblers.
- To know the design and implementations of linkers and loaders.
- 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 ASSEMBLERS AND MACROS 8
Overview of Language processors – Assemblers: design of two pass assemblers – single pass assemblers MACRO: Macro definition – macro call – macro expansion – nested macro – advanced macro facilities- Design of Macroprocessor

UNIT II LOADERS AND LINKERS 10

UNIT III LEXICAL ANALYSIS AND SYNTAX ANALYSIS 9
Introduction to Compiling – The phases – Cousins – The grouping of phases The role of the lexical analyzer – Syntax Analysis – The role of the parser – Context-free grammars – Writing a grammar – Top down parsing – Bottom-up Parsing – LR papers – Constructing an SLR(1) parsing table

UNIT IV INTERMEDIATE CODE GENERATION 9

UNIT V CODE GENERATION AND OPTIMIZATION 9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Discuss the Assembler and Macros concepts
- Design the Loaders and Linkers
- Describe the principles of a Compiler
- Generate intermediate code
- Evaluate the code optimization techniques
TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:

- To understand the basic concepts of big data, methodologies for analyzing structured and unstructured data
- To understand the basic of big data and analytics and Hadoop.
- To be able to analyze the various technologies & tools associated with Big Data

UNIT I UNDERSTANDING BIG DATA 8

Definition of big data – Uses big data – Characteristics of big data – Challenges with big data – Technology Landscape – Big Data Analytics – Analytics 1.0, analytics 2.0, Analytics 3.0 – Big Data technology Landscape – NoSQL Databases – NoSQL Vs. RDBMS – New SQL – Hadoop – Hadoop 1.0, vs. Hadoop 2.0.

UNIT II INTRODUCTION TO HADOOP 10

Hadoop Overview – Hadoop Distributed File System – Processing Data With Hadoop – Managing Resources and Applications with Yarn – Introduction to Mongoddb

UNIT III HADOOP RELATED TOOLS 12


List of Experiments: 30

1. Data structures in Java: Linked List, Stacks, Queues, Sets, Maps.
2. Install the Hadoop in standalone mode.
3. Implement the frequently used Hadoop shell commands.
4. Running a WordcountMapreduce example in Hadoop 2.4.1 Single-node Cluster in Ubuntu 14.04 (64-bit)
5. Write the Map reduce program for Weather Dataset.
6. Install the Apache Pig
7. Implement the Apache Pig Latin scripts on
   - Describe Operator
   - Basic Grunt shell commands
   - For each operator
   - Order By operator
8. Install the Hive.
9. Execute Hive Scripts and Implement Hive Script in Java

TOTAL: 60 PERIODS
COURSE OUTCOMES:
After the successful completion of the course students will be able to

- Explain big data and use cases from selected business domains.
- Analyze, Install, configure, and run Hadoop and HDFS.
- Perform map-reduce analytics using Hadoop.
- Apply hadoop related tools such as Hbase, Cassandra, pig, and hive for big data analytics.

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- Describe approaches to enterprise application integration
- Understand the integration middleware
- Evaluate the integration approaches suitable for a given problem

UNIT I    INTRODUCTION   8
Requirements for EAI- Challenges in EAI- Integration with legacy systems- Integration with partners-
Heterogeneous environment- Implementation approaches- Web services, messaging, ETL, direct
data integration- Middleware requirements- Approaches to integration- services oriented and
messaging.

UNIT II    INTEGRATION PATTERNS   8
Introduction to integration patterns- Architecture for application integration- integration patterns-Point
to point, broker, message bus, publish/subscribe, challenges in performance, security, reliability-
Case studies.

UNIT III    SERVICE ORIENTED INTEGRATION   10
Business process integration - Composite applications-services-Web services- Service choreography
and orchestration- Business process modeling-BPMN, Business process execution -BPEL-
Middleware infrastructure-Case studies.

UNIT IV    MESSAGING BASED INTEGRATION   9
Messsaging- Synchronous and asynchronous- Message structure- Message oriented middleware-
Reliability mechanisms- Challenges- Messaging infrastructure- Java Messaging Services- Case
studies.

UNIT V    ENTERPRISE SERVICE BUS   10
Enterprise service Bus- routing, scalable connectivity, protocol and message transformations, data
enrichment, distribution, correlation, monitoring-Deployment configurations- Global ESB, Directly
connected, Federated, brokered ESBS- Application server based- Messaging system based-
Hardware based ESBS- Support to SOA, Message based and event based integrations- Case
studies.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain different approaches to integration enterprise applications
- Analyze specifications and appropriate integration approaches
- Develop a suitable service oriented integration design for a given problem
- Identify appropriate integration middleware for a case study
- Apply suitable deployment configuration for a given enterprise service bus
TEXT BOOKS:


REFERENCE BOOKS:


PRE-REQUISITES: 15UIT405 DATABASE MANAGEMENT SYSTEMS

COURSE OBJECTIVE:
- To familiar with a commercial relational database system
- To understand the relational database theory
- To expose various databases

UNIT I  PARALLEL AND DISTRIBUTED DATABASES  10
Database System Architectures: Centralized and Client-server Architectures-Server System architectures - Parallel Systems- Distributed systems- Parallel Databases: I/O parallelism- Inter and intra Query Parallelism- Inter and Intra operation Parallelism- Distributed Database Concepts- Distributed Data Storage- Distributed Transactions- Commit Protocols- Concurrency control- Distributed Query processing.

UNIT II  OBJECT AND OBJECT RELATIONAL DATABASES  10

UNIT III  XML DATABASES AND MOBILE DATABASES  10

List of Experiments  30
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 on 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 form $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 person 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.
   i. Insert details in each object
   ii. Display th 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, deptManager SSN, deptManagerStartDate, deptLocation)
Employee (empname, empSSN, empSex, empSalary, empBirthDate, empDeptNo, empSupervisorSSN, empAddress, empWorksOn) Project (projName, projNo, projLocation, projDeptNo, projWorker)
7. Implement a storage structure for storing XML database and test with the above schema.
8. Create applications using Triggers.
10. Develop an application using mobile database.

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain the Parallel and distributed databases for an application
- Design an application using object relational databases
- Construct an XML database
- Create a mobile database
- Compare various intelligent databases.

TEXT BOOKS:

REFERENCE BOOKS
PRE-REQUISITES:

COURSE OBJECTIVE:
- 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  10
GNU/Linux Architecture, Architectural breakdown of Major Kernel components, Linux distributions
GNU Compiler Tool Chain, Building Software with GNU Make, Make file constructs. Static- Shared-
Dynamic Libraries, Building Packages with Auto make/ Auto conf

UNIT II  FILE HANDLING TOOLS AND GRAPHICS TOOLS  10
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 III  TEXT PROCESSING TOOLS  10
Bash beginnings, Pathnames and Permissions, Useful elements, cron job, Script Versions Text
processing with awk and sed scripts.

Lab Experiment  30
1. Kernel configuration, compilation and installation
2. Virtualization environment
3. Installing Various software packages
4. Write user space drivers using fuse
5. GUI programming
6. Version control system setup and usage
7. Text processing with Perl
8. Running PHP
9. Running Python
10. Set up the complete network interface

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
- Choose an appropriate methods to process text
- Apply various standards, copyright issues and licenses for FOSS

TOTAL: 60 PERIODS
TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES: 15UIT601 Data Warehousing and Data Mining

COURSE OBJECTIVE:
- 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  10

UNIT II  MODELLING, AGGREGATING AND KNOWLEDGE REPRESENTATION  8

UNIT III  EXTRACTION AND MINING COMMUNITIES IN WEB SOCIAL NETWORKS  9

UNIT IV  PREDICTING HUMAN BEHAVIOUR AND PRIVACY ISSUES  9
UNIT V VISUALIZATION AND APPLICATIONS OF SOCIAL NETWORKS


TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course, the students will be able to
- Explain the core concepts of social network analysis
- Develop semantic web related applications
- Make use of methods for web community detection and mining in social networks
- Analyze human behavior in social web and related communities
- Apply the visualization techniques to social networks

TEXT BOOKS

REFERENCE BOOKS
15UIT921        ETHICAL HACKING AND INFORMATION FORENSICS  L  T  P  C
                              3  0  0  3

PRE-REQUISITES: 15UIT501 CRYPTOGRAPHY AND NETWORK SECURITY

COURSE OBJECTIVE:
• To learn various hacking techniques and attacks
• To known how to protect information assets against various hacking
• To perform penetration tests into secure networks for evaluation purposes
• To understand information analysis associated with the nature of forensics

UNIT I        FUNDAMENTALS OF HACKING  9

UNIT II        FOOT PRINTING  9

UNIT III        NETWORK PROTECTION SYSTEM AND HACKING WEB SERVERS  9

UNIT IV        INTRODUCTION TO INFORMATION FORENSICS  9

UNIT V        FORENSIC ANALYSIS AND TOOLS  9

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Illustrate the fundamental key concepts of hacking and roll of hacker
- Compare various types of hacking methods in different services
- Apply penetration test method for protecting different web services
- Examine computer forensic investigation and journaling technique in misuse detection
- Adapt forensic data hiding technique for different forensic services

TEXT BOOKS

REFERENCE BOOKS
PRE-REQUISITES:

COURSE OBJECTIVE:
- To learn the architecture of semantic web
- To understand the implementation of ontology
- To learn the semantic relationships among XML data elements Using Resource Description Framework (RDF)
- To study the OWL Web Ontology Language
- To learn Semantic Web tools and different applications

UNIT I  INTRODUCTION  9

UNIT II  ONTOLOGICAL ENGINEERING  9

UNIT III  STRUCTURING AND DESCRIBING WEB RESOURCES  9

UNIT IV  WEB ONTOLOGY LANGUAGE  9
UNIT V SEMANTIC WEB TOOLS AND APPLICATIONS


TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the courses, the students will be able to
- identify the features of syntactic and semantic web
- Develop a small ontology for specific problem domain
- Explain data in XML with appropriate semantic tags
- Make use of web ontology language
- Apply semantic web tools for an application

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To cater the knowledge of Neural Networks and Fuzzy Logic control
- Be exposed to Link Analysis
- Understand Hadoop and Map Reduce
- Learn document text mining techniques

UNIT I  INTRODUCTION TO NEURO FUZZY AND SOFT COMPUTING

UNIT II  NEURAL NETWORKS

UNIT III  FUZZY LOGIC

UNIT IV  NEURO – FUZZY MODELING

UNIT V  ADVANCED APPLICATIONS

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the Successful completion of the course students will be able to
- Explain the basis of neuro fuzzy systems and soft computing
- Make use of the concept of feed forward network and major task of machine learning technique
- Examine the fuzzy logic operations and rules
- Analyze the various adaptive learning capability
- Apply neuro fuzzy system for an application

TEXT BOOKS

REFERENCE BOOKS:
15UIT924 AGILE SOFTWARE DEVELOPMENT (COMMON TO CSE AND IT) L T P C 3 0 0 3

PRE-REQUISITES:

COURSE OBJECTIVE:
- 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 9

UNIT II AGILE SCRUM FRAMEWORK 9
Introduction to scrum, project phases, Agile Estimation, planning game, product backlog, sprint backing 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 Team, Scrum case study, Tools for Agile project management

UNIT III AGILE TESTING 8
The Agile lifecycle and its impact on testing, Test-Driven Development (TDD) , X unit 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 project management

UNIT IV AGILE SOFTWARE DESIGN AND DEVELOPMENT 10
Agile design practices, role of design principles including single Responsibility principle, open closed principle, Liskov Substitution Principle, interface Segregation principles, Dependency inversion principle in Agile Design, Need and significance of Refactoring, Refactoring Techniques, continuous integration, Automated build tools, Version control

UNIT V INDUSTRY TRENDS 9
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 this course, the student will be able to

- Apply the knowledge of design principles and refactoring techniques to achieve agility
- Function effectively as an individual and as a member or leader in agile framework
- Apply appropriate techniques for test driven development
- Design solution for complex information and communication engineering problems using agile principles
- Formulate testing activities within a agile project to meet the industry needs

TEXT BOOKS

REFERENCE BOOKS:
5. www.it-ebooks.info/tag/agile.
PRE-REQUISITES:

COURSE OBJECTIVE:

- Learn the information retrieval models
- Be familiar with Web Search Engine
- Be exposed to Link Analysis
- Understand Hadoop and Map Reduce
- Learn document text mining techniques

UNIT I  INTRODUCTION


UNIT II  INFORMATION RETRIEVAL


UNIT III  WEB SEARCH ENGINE – INTRODUCTION AND CRAWLING


UNIT IV  WEB SEARCH – LINK ANALYSIS AND SPECIALIZED SEARCH


UNIT V  DOCUMENT TEXT MINING

Information filtering, organization and relevance feedback – Text Mining – Text classification and clustering – Categorization algorithms: naïve Bayes; decision trees; and nearest neighbor – clustering algorithms; agglomerative clustering; k-means; expectation maximization (EM).

TOTAL: 45 PERIODS
COURSE OUTCOMES:

After the successful completion of the course students will be able to
- Make use of Artificial Intelligence techniques in Information Retrieval
- Analyze the various crawling techniques
- Choose an appropriate searching techniques in web services
- Apply document text mining techniques

TEXT BOOKS:


REFERENCE BOOKS:

15UIT926 VISUALIZATION TECHNIQUES

PRE-REQUISITES: 15UIT504 GRAPHICS AND MULTIMEDIA

COURSE OBJECTIVE:
- To Understand the basic Concepts of Visualization
- To expose the foundations and computer visualization
- To familiarize with multi dimensionally and emerging techniques

UNIT I VISUALIZATION
Introduction-Issues-Data Representation – Data Presentation - Interaction

UNIT II FOUNDATIONS FOR DATA VISUALIZATION
Visualization stages – Experimental Semiotics based on Perception Gibson’s Affordance theory- A Model of Perceptual Processing – Types of Data

UNIT III ARCHITECTURAL VIEWS
Non-Computer Visualization – Computer Visualization Exploring Complex Information Spaces – Fisheye Views – Applications – Comprehensible Fisheye views – Fisheye views for 3D data – Non Linear magnification – Comparing Visualization of Information Spaces – Abstraction in computer Graphics – Abstraction in user interfaces

UNIT IV MULTIDIMENSIONAL VISUALIZATION

UNIT V CASE STUDIES
Small interactive calendars – Selecting one from many – Web browsing through a key hole – Communication analysis – Archival analysis

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course, the students will be able to
- Explain the basic principles of visualization techniques
- Identify the foundations of experimental semiotics and types of data.
- Analyze the Non-Computer Visualization and Computer Visualization
- Compare the multiple dimensions of visualization
- Analyze the suitable visualization tools for an application
TEXT BOOKS:

REFERENCE BOOKS:
15UIT927 MOBILITY ENGINEERING

L T P C
3 0 0 3

PRE-REQUISITES: 15UIT908 WIRELESS COMMUNICATION

COURSE OBJECTIVE:
- Learn knowledge on various mobile technologies available and their future trends
- Understand about the devices, platform, various layers involved in Mobile Architecture
- Understand about Enterprise mobility Solution layers and Architecture
- Learn Mobile apps using Android OS
- Understand applications of mobile testing in the Industries

UNIT I INTRODUCTION TO MOBILITY

UNIT II ENTERPRISE MOBILITY ADAPTATION AND MARKETING CHANNEL

UNIT III ENTERPRISE MOBILITY LAYERS AND SOLUTION ARCHITECTURE

UNIT IV MOBILE APPLICATION DEVELOPMENT ENVIRONMENT

UNIT V MOBILITY TESTING AND APPLICATIONS

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of the course, the students will be able to
- List the challenges in enterprise mobility
- Analyze the various types of marketing
- Explain the enterprise mobility layers
- Develop mobile apps using Android OS
- Examine the mobility scenario for an application

TEXT BOOKS:

REFERENCE BOOKS:
15UIT928  NATURE AND BIO INSPIRED COMPUTING  L  T  P  C
                                                3  0  0  3

PRE-REQUISITES:

COURSE OBJECTIVE:
- To explain how biological systems exploit natural processes
- To design and implement simple bio-inspired algorithms
- To understand how large numbers of agents can self-organize and adapt

UNIT I  INTRODUCTION  9

UNIT II  ANT COLONY OPTIMIZATION  9

UNIT III  APPLICATIONS  9

UNIT IV  SWARM INTELLIGENCE  9
Biological foundations of Swarm Intelligence – Swarm Intelligence in Optimization – Particle Swarms for dynamic optimization problems

UNIT V  COMPUTING PARADIGMS  9
Biological Inspired computing to Natural Computing – Integration of Evolutionary Computation Components in Ant Colony Optimization – Particle Swarm Optimization based on Socio-cognition.

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Utilize the knowledge about the Nature and Bio inspired Computing
- Explain the computational complexity of search heuristics using biologically inspired computing
- Discover the state-of-the-art of present technology
- Analyze the swarm intelligence techniques
- Construct the reconfigurable architectures and computational Intelligence techniques.
TEXT BOOKS


REFERENCE BOOKS:

PRE-REQUISITES:

COURSE OBJECTIVE:
- To get through understanding of the kernel
- To understand the file organization and management
- To have knowledge of various system calls, process architecture, process control, scheduling and memory management

UNIT I  GENERAL OVERVIEW OF THE SYSTEM

UNIT II  BUFFER CACHE

UNIT III  SYSTEM CALLS FOR FILE SYSTEM

UNIT IV  THE STRUCTURE OF PROCESSES

UNIT V  PROCESS SCHEDULING AND MEMORY MANAGEMENT POLICIES

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After Completion of the course, the students will be able to
- Analyze the basic structure and services of UNIX operating systems
- Demonstrate Buffer and File system of UNIX
- Compare various system calls for file system
- Apply the structure of system processes
- Categorize process scheduling and memory management schemes

TEXT BOOKS:

REFERENCE BOOKS:
PROGRAMMING WITH PYTHON

PRE-REQUISITES:

COURSE OBJECTIVE:
- To learn how to identify Python object types.
- To learn how to design object oriented programs with Python Classes.
- To learn how to use exception handling in Python applications for error handling.
- To learn how to use class inheritance in Python for reusability.
- To learn how to read and write files in Python.
- To learn how to design and program python applications.

UNIT I  GETTING STARTED WITH PYTHON

UNIT II  FUNCTIONS AND EXCEPTION

UNIT III  MODULES AND CLASS

UNIT IV  FILES AND DATA BASES
File I/O operations – Directory Operations – Reading and Writing in structured Files: CSV and JSON – Data manipulation using Oracle, MySQL and SQLite

UNIT V  GUI AND WEB
UI design: Tkinter – Events – Socket Programming – Sending email – CGI: Introduction to CGI Programming, GET and POST Methods, File Upload

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to

- Apply the knowledge of Python Programming elements to solve and debug logical Problems
- Demonstrate Programs using functions and exceptions
- Real time Applications using Object Oriented Concepts
- Analyze Various techniques used to store and retrieve data in files and databases
- Develop an application that meet with realistic constraints for public health and safety, cultural, societal and environmental considerations user GUI Principles

TEXT BOOKS:

REFERENCE BOOKS

WEB REFERENCES:
1. Python tutorial URL:, https://docs.python.org/3/tutorial/
2. Advanced Python URL:, https://www.learnpython.org/
3. Python basic tutorial URL:, www.pyschools.com/
COURSE OBJECTIVE:
- To provide the importance of the software design process
- To assess Unified Modeling Language and use the UML design diagrams
- To learn basic OO analysis and design skills through case study
- To learn the appropriate usage of design patterns.

UNIT I INTRODUCTION
Case study: Develop a Problem statement

UNIT II OBJECT ORIENTED ANALYSIS
Objects Analysis – Use case Diagram – Identifying use cases and relationships – Class Diagram – Identifying Attributes and Methods
Case study: Analyzing Use case Driven Process

UNIT III OBJECT ORIENTED DESIGN
Case study: Draw the UML Diagrams for Real Time Application

UNIT IV OBJECT ORIENTED METHODOLOGIES
Rumbaugh Methodology – Booch Methodology – Jacobson Methodology – Patterns – Frameworks – Unified Approach
Case Study: Identify the User Interface, Domain Objects, and Technical services
(Code generation)

UNIT V OBJECT ORIENTED TESTING
Case study: Perform testing for simple applications

TOTAL: 45 PERIODS
COURSE OUTCOMES:

After completion, the student will be able to

- Apply the knowledge of Object Oriented software development
- Analyze object oriented concepts by creating use case and class diagrams
- Apply appropriate UML diagrams for Object Oriented design
- Identify Object Oriented methodologies to develop OO Design patterns and frameworks
- Apply various testing strategies for real world applications

TEXT BOOKS


REFERENCE BOOKS

COURSE OBJECTIVE:

- 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 impart the knowledge of Backup and Archive in virtualized and non-virtualized Environment

UNIT I  STORAGE SYSTEMS
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
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 REPLICATION
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
Cloud Computing – Cloud computing, its benefits, characteristics, deployment models and services. Cloud challenges and migration considerations.
UNIT V SECURING AND MANAGING STORAGE INFRASTRUCTURE

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 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:
15UCS925 BUSINESS INTELLIGENCE AND ITS APPLICATIONS  
L T P C  
3 0 0 3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce business intelligence terminologies and framework
- To impart the knowledge on basics of data integration (Extraction Transformation Loading)
- To explain the concepts of multi-dimensional data modeling.
- To review the basics of enterprise reporting different data analysis tools and techniques.

UNIT I INTRODUCTION TO BUSINESS INTELLIGENCE  

UNIT II BASICS OF DATA INTEGRATION (EXTRACTION TRANSFORMATION LOADING)
Concepts of data integration need and advantages of using data integration, introduction to common data integration approaches, introduction to ETL using SSIS, Introduction to data quality, data profiling concepts and applications.

UNIT III INTRODUCTION TO MULTI-DIMENSIONAL DATA MODELING
Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. Multi-dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using SSAS.

UNIT IV BASICS OF ENTERPRISE REPORTING
Introduction to enterprise reporting, concepts of dashboards, balanced scorecards, introduction to SSRS Architecture, enterprise reporting using SSRS.

UNIT V FUTURE OF BUSINESS INTELLIGENCE

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
• Describe the need for Business Intelligence.
• Demonstrate technology and processes associated with Business Intelligence framework.
• Identify the metrics, indicators and make recommendations to achieve the business goal in a given business scenario.
• Design an enterprise dashboard that depicts the key performance indicators which helps in decision making
• Illustrate the concepts for the future of business intelligence.

TEXT BOOKS:

REFERENCE BOOKS:
### INTER DISCIPLINARY ELECTIVE COURSES

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<td>15UGM953</td>
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SMART MANUFACTURING
(Common to IT & Mech)

PRE-REQUISITES:

COURSE OBJECTIVE:
- To introduce the smart connected systems using Internet of Things, Cloud and Industrial Automation
- To use devices in IoT Technology
- To familiarize the concepts of designing and developing various service models (IaaS, Paas and SaaS) and deployment models (Public, Private and Hybrid clouds).

UNIT I INDUSTRY 4.0
Introduction to Industrial revolutions - Industry 4.0 environment - Drivers of industry 4.0 - Digital integration in smart factory - Cyber Physical System, Internet of Things and Services - New technologies for future manufacturing - Benefits and Challenges of Industry 4.0

UNIT II ADDITIVE MANUFACTURING AND 3D PRINTING

UNIT III ROBOTS IN MANUFACTURING

UNIT IV INTERNET OF THINGS

UNIT V CLOUD SERVICES AND FILE SYSTEM

TOTAL: 45 PERIODS
COURSE OUTCOMES:

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

- Explain about the industrial revolutions, IoT, benefits and challenges of Industry 4.0
- Describe an overview of additive manufacturing for industrial products
- Explain about applications of robots in manufacturing industry and social impact
- Design IoT Components that meet with realistic constraints for societal and environmental considerations.
- Apply the knowledge of virtualization techniques to provide Iaas, Saas, Paas.

TEXT BOOKS:


REFERENCE BOOKS:

BIG DATA AND IOT IN MEDICAL APPLICATIONS
(Common to IT & Bio-Medical)

L T P C
3 0 0 3

PRE-REQUISITES:

COURSE OBJECTIVE:

- To introduce the basics of Internet of things (IoT) and protocols
- To explain the concepts of Web of Things and Cloud of Things
- To discuss the healthcare operations and recent development

UNIT I INTRODUCTION TO BIGDATA
9

UNIT II DATA ANALYSIS
9

UNIT III INTRODUCTION TO IoT
9

UNIT IV INTRODUCTION TO HEALTH CARE OPERATIONS
9
A systems look at health care – opportunities and challenges – Integrated framework for operations management – Evidence Based Medicine and Pay for Performance – Hospital business operations

UNIT V RECENT DEVELOPMENTS
9
Techniques and tools – Map Reduce paradigm and the Hadoop system – IoT: Clustering, Synchronisation and Software Agents. Applications, Social Media Analytics – Recommender Systems – Fraud Detection – Big Data in Medicine and Healthcare

TOTAL: 45 PERIODS
COURSE OUTCOMES:

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

- Analyze various protocols for IoT and a middleware for IoT.
- Implement the different models for network dynamics.
- Identify the various sources of Big Data, new algorithms for collecting Big Data from various sources.
- Design algorithms for pre-processing Big Data and to extract data from structured and unstructured data for analytics.
- Apply IoT in medicine and health care applications.

TEXT BOOKS:


REFERENCES:

## MULTIDISCIPLINARY ELECTIVE COURSE

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PRE-REQUISITES:

COURSE OBJECTIVE:
- To expose the students to the concept of Agriculture Automation and Farm Mechanization
- To learn about the different types of primary and secondary tillage implements, farm equipment and ploughing methods.
- To introduce the concepts of Automatic Systems and IoT applications
- To train the students to explore and use new technologies in Agriculture

UNIT I
INTRODUCTION TO FARM MECHANIZATION & AGRICULTURE AUTOMATION 8
Sources of farm power- merits & demerits of different farm power- farm mechanization-concept – scope-constraints & scope – selection factors. Mechanization in farm operations. Introduction - agriculture automation.

UNIT II
TILLAGE IMPLEMENTS & AUTOMATION IN SOWING, PLANTERS 10

UNIT III
SYSTEMS OF AUTOMATION 8

UNIT IV
IOT IN AGRICULTURE 10

UNIT V
AGRICULTURAL ROBOT 9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After successful completion of this course the students will be able to:
- Understand the importance of Farm mechanization concept of Agriculture Automation.
- Classify the various tillage implements, seed drills, automation in Sowing and planters
- Apply the knowledge of different systems to automate irrigation.
- Apply the knowledge of IoT to design smart systems for automating Agriculture.
- Apply the knowledge of robots to automate crop cultivation in Agriculture
TEXT BOOKS:

REFERENCE BOOKS:
# ONE CREDIT COURSES

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PRE-REQUISITES:

COURSE OBJECTIVE:
- To familiarize the students with the characteristics of IT IMS
- To learn the Technology drivers of infrastructure evolution

UNIT I
IT IMS-operation and management of an enterprise IT environment. Hardware, Software, network resource, servers, data centers and required for the existence. This discipline of managing & maintaining hardware, network systems and applications and is commonly referred as infrastructure management services (IMS).

UNIT II
Information Technology has become critical in every business, right from banking, finance, insurance, automobile, aviation, media, and entertainment and so on. Usage of computers, hardware devices and network is rapidly growing. For businesses, it is becoming very vital to keep the hardware, networks and applications functionally up to date and running in 24 X 7 mode.

UNIT III
Today it is one of the most rapidly growing disciplines in information technology arena and it is being seen as the third wave in Indian IT industry. Introduction evolution of IT infrastructure. IT IMS market size. Recent trends in IT infrastructure management. Infrastructure components. Technology drivers of infrastructure evolution. IT IMS-industries expectation from an engineer. Employability skills essential for an engineer to be part of the domain – IMS. IT IMS Indian scenario job role & opportunities in IT IMS industry.

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain the Infrastructure management service
- Analyze the need of Hardware and Network in a business
- Apply the employability skills essential for an engineer to be part of the domain - IMS

TOTAL: 15 PERIODS
15UCS861 SOFTWARE PROJECT MANAGEMENT  L  T  P  C
1 0 0 1

PRE-REQUISITES:

COURSE OBJECTIVE:
- To familiarize the students with the characteristics of a project and project management principles
- To summarize competency in the management of a project plan, especially in monitoring and controlling the project schedule and tracking project progress

UNIT I PROJECT EVALUATION AND PROJECT PLANNING  5

UNIT II ACTIVITY PLANNING  5

UNIT III PROJECT MANAGEMENT AND CONTROL  5

TOTAL: 15 PERIODS

COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Explain the process involved in software project management.
- Prepare the activity plan to manage real-world challenges.
- Apply appropriate mechanisms for tracking the software projects.

TEXT BOOKS:

REFERENCE BOOKS:
UNIT I    BASIC 3D MODELING TECHNIQUES  4
Model with Primitives Reference Coordinate Systems and, Applying Transforms and Sub-Object Mode, Cloning and Grouping and Poly Modeling, Creating Shapes with Splines, Editing Meshes and Creating Complex Objects

UNIT II    ENHANCING MODELS WITH MATERIALS  4
Understanding Bitmap Texture Maps, Adding Materials to Objects & Material Libraries, Editing Materials & Map scalar Modifiers, Modeling with displacement Maps

UNIT III   INTRODUCTION TO ANIMATION  3
Copying Key frames, Path Animation and Trax Editor, Anticipation and Momentum in Knife Throwing, Setting Up the Scene and Beginning the Soldier Model

UNIT IV    CHARACTER ANIMATION  4
Character Modelling and Texturing, Skeleton and Iks and Keys, Export the character and its animations, Load the Character in Virtools, Material & texture tuning, Merge animations & add behaviors.

TOTAL: 15 PERIODS

COURSE OUTCOMES:
After successful completion of the course the student will able to
- Discuss the principles of narrative and timing in relation to 3D animation
- Create texture, illuminate and render images and backgrounds in the production of simple 3D animation sequences, using 3D animation software.
- Present and critique 3D animation concepts.

TEXT BOOKS:
UNIT I  HISTORY OF PHP & PHP VARIABLE  2
Client side scripting, Server side scripting, Characteristics of PHP, Syntax of PHP and Hello World program, Data types and variables, PHP Server variables, PHP Constants, Arrays & String

UNIT II  OPERATORS  2
Arithmetic operators, Comparison operators, Logical operators, string operators, Array operators

UNIT III  BRANCHING & LOOPING  2
If-Else, Nested If – Else, For, While, Do – While, Switch

UNIT IV  PHP-FUNCTIONS  2
In build Function, User Defined Function, and Calendar Function

UNIT V  ADVANCE PHP  7
PHP Session, PHP Cookies, File Upload, File Handlings, PHP Form Handling, Do-Get (), Do-Post(), PHP – Database Connectivity

TOTAL: 15 PERIODS

COURSE OUTCOMES:
After successful completion of the course the student will able to
- Develop functional PHP script
- Understand the use of PHP with HTML
- Understand the ability to post and publish a PHP website.
- Develop Web Applications

TEXT BOOKS:
15UIT864 ANDROID PROGRAMMING –I  L  T  P  C
1 0 0 1

PRE-REQUISITES:

COURSE OBJECTIVE:
- To understand the essentials of mobile apps development
- To understand the fundamental concept of designing and developing

UNIT I INTRODUCTION TO ANDROID
Introduction to android (features, applications), Environment setup, Architecture, Applications Component, Hello world example

UNIT II ACTIVITY CREATION
Activities, Services, Media player, Broadcast receivers

UNIT III COMPONENT FUNCTIONALITIES
Content providers, Intents & filters, Event handling

UNIT IV LAYOUTS
Ul layouts, Relative, linear, table, Grid view, Ul controls, Notifications

TOTAL: 15 PERIODS

COURSE OUTCOMES:
After successful completion of the course the student will able to
- Understand the existing state of mobile app development via researching existing apps, and formulating new ideas.
- Display proficiency in coding on a mobile programming platform.
- Understand the limitations and features of developing for mobile devices.

REFERENCE LINKS:
1. https://www.bignerdranch.com/we-write/android-programming
15UIT865 ANDROID PROGRAMMING –II

PRE-REQUISITES:

COURSE OBJECTIVE:
- To understand the fundamental concept of designing and developing
- To learn the various testing process.

UNIT I CUSTOM COMPONENTS 4
Sending Email, Sending SMS, Phone Calls, Audio Manager

UNIT II SENSORS 4
Network Connection, Image Switcher, Image view, Gestures

UNIT III INTERNAL STORAGE 3
Sqlite Database creation, Sqlite Database Access and Modification File Storage

UNIT IV PHP/SQL 4
Mysql integration with android, server side integration, push notifications, screen cast.

TOTAL: 15 PERIODS

COURSE OUTCOMES:
After successful completion of the course the student will able to
- Use the development tools in the Android development environment
- Display proficiency in coding on a mobile programming platform.
- Create a complete Mobile app with a significant programming component, involving the sensors and hardware features of the phone.

REFERENCE LINKS:
1. https://www.bignerdranch.com/we-write/android-programming
PRE-REQUISITES:

COURSE OBJECTIVE:
- To learn the python fundamentals
- To learn the database fundamentals
- To learn python database integration

UNIT I PROGRAMMING FUNDAMENTALS 5

UNIT II DATABASE FUNDAMENTALS 5
Data and Need for DBMS - Relational Model and Keys - Database Development Life Cycle- Data Requirements - Logical Database Design - Physical Database Design - Normalization - Implementation with SQL - SQL - Built-in Functions - SQL - GroupBy and Having Clauses

UNIT III PYTHON DATABASE INTEGRATION 5
Python Database Integration – Pre-requisites and Installation – SELECT Operation – CREATE and INSERT Operation – UPDATE Operation – DELETE Operation – Exception Handling

COURSE OUTCOMES:
After Successful completion of the course the student will able to
- Illustrate basic concepts of python programming
- Illustrate basic concepts of Database Fundamental
- Apply database integration with Python

COURSE MATERIAL
SELF LERNING MODE LINK: https://campusconnect.infosys.com/Content/FPContent.aspx
## OPEN ELECTIVES

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PRE-REQUISITES:

COURSE OBJECTIVE:
- Identify major components including motherboards, memory, drives, peripheral devices
- Introduce troubleshooting and maintaining the computer system
- Provide opportunities to develop basic techniques with respect the hardware of a computer system

UNIT I INTRODUCTION

UNIT II PERIPHERAL DEVICES

UNIT III PC HARDWARE OVERVIEW
Introduction – Hardware BIOS DOS Interaction – The PC family – PC Hardware – Inside the System Box – Motherboard Logic – Memory Space – Peripheral Interfaces and Controllers – Keyboard Interface – CRT Display interface – FDC-HDC.

UNIT IV INSTALLATION AND PREVENTIVE MAINTENANCE

UNIT V TROUBLESHOOTING

TOTAL: 45 PERIODS
COURSE OUTCOMES:

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

- Apply the knowledge of working principles of various hardware devices and functions of OS.
- Distinguish the characteristic features of various peripheral devices.
- Identify and analyze the problems on Internal and External components of Computer Hardware.
- Apply the installation procedures to maintain data security and integrity.
- Analyze the computer faults using various diagnosis techniques.

TEXT BOOKS:


REFERENCE BOOKS:

COURSE OBJECTIVE:
- Understand the concept of social network
- Learn knowledge in market and strategic interaction in network
- Learn the effects of social networks

UNIT I   INTRODUCTION TO SOCIAL NETWORK  9

UNIT II   STRUCTURAL AND LOCATIONAL PROPERTIES  9

UNIT III   SOCIAL NETWORK ANALYSIS  9

UNIT IV   MARKET AND STRATEGIC INTERACTION IN NETWORK  9

UNIT V   NETWORK DYNAMICS  9

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Understand the basics of social networks.
- Apply the knowledge of structural and locational properties to find the roles and network positions
- Analyze the concepts of web analysis
- Analyze the market and strategic interaction in social networks.
- Analyze the performance effects of dynamic networks.

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:

- To set high forensics and ethical standards for cyber security, digital and computer forensics
- To know the hackers and the counter measures against malicious attacks
- To know the Cyber Forensics to Law Enforcement

UNIT I  INTRODUCTION TO CYBER FORENSICS  9

UNIT II  NETWORK FORENSIC INVESTIGATION  10

UNIT III  INTERNET AND EMAIL CRIME INVESTIGATION  10

UNIT IV  MOBILE FORENSICS  9

UNIT V  CYBER CRIME LAW  7

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Demonstrate the fundamentals of cyber Forensics technology and its types
- Make use of network components for forensic investigation
- Categories the internet and email crime investigation based on web attacks
- Examine the performance of mobile evidence extraction technique for android forensic
- Analyze the laws, acts and penalties of cybercrime regulation authorities

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:

- Acquire skills in generating computer graphics and animated pictures
- Acquire skills and mastery in the use of different software producing graphics and animation.
- Impart real-life advertisement exposure in an organization

UNIT I  FUNDAMENTALS  9
History of Animation, Introduction to Animation, Terms used in Animation, Types of Animation - Skills for Animation Artist - Basic Principles of Animation - Animator's Drawing Tools - Rapid Sketching & Drawing.

UNIT II  ANIMATION  9
Developing Animation Character - Anatomy & Body Language - Introduction to equipment required for animation - Developing the characters with computer animation, D virtual drawing for animation, sequential movement drawing - Thumbnails, motion studies, drawing for motion - Essentials & qualities of good animation characters.

UNIT III  2D ANIMATION  9
Overview of Flash - Introduction to the flash interface - Setting stage dimensions, working with panels, panel layouts - Introduction to drawing and drawing tools in Flash - Panels - Description, modifying, Saving & deleting a panel - Layers & Views.

UNIT IV  3D ANIMATION  9
Introduction - Context for 3D Studio Max - Exploring the Max Interface - Controlling & Configuring the view ports - Working with Files, importing exporting - Creating & editing primitive objects.

UNIT V  MODELING  9
Accessing sub objects and using modeling helpers - Introduction to modifier & using modifier stack - Drawing & Editing 2D Spines & shapes - Modeling with polygon & Patch - Using the Graphic Modeling & Painting with objects.

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to

- Apply the knowledge of principles of animation and techniques to create the own video and PPT creation.
- Apply the knowledge of computer animation to develop the characters.
- Select and apply the appropriate techniques to implement the 2D Animation.
- Select and apply the appropriate techniques to implement the 3D Animation.
- Apply the knowledge of modeling task to design an application.

TEXT BOOKS:

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To understand the basic structure and operation of a digital Computer
- To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point addition, subtraction, multiplication & Division
- To study in detail the different types of control and the concept of pipelining
- To study the hierarchical memory system including cache memories and virtual Memory
- To study the different ways of communicating with I/O devices and standard I/O Interfaces

UNIT I BASIC STRUCTURE OF COMPUTERS
Functional units - Basic operational concepts - Bus structures - Performance and Metrics - Memory Locations & addresses, Memory operations - Instructions and instruction sequencing - Hardware - Software Interface - Instruction set architecture - Addressing modes - RISC - CISC.

UNIT II COMPUTER ARITHMETIC
Addition and subtraction of signed numbers - Design of fast adders - Multiplication of positive numbers - Signed operand multiplication and fast multiplication - Integer division

UNIT III PROCESSOR AND CONTROL UNIT
Basic MIPS implementation - Building data path - Control Implementation scheme - Pipelining - Pipelined data path and control - Handling Data hazards & Control hazards - Superscalar Operation.

UNIT IV PARALLELISM
Instruction-level-parallelism - Parallel processing challenges - Flynn’s classification - Hardware multithreading - Multi-core processors

UNIT V MEMORY AND I/O SYSTEMS
Memory hierarchy - Memory technologies - Cache basics - Measuring and improving cache performance - Virtual memory, TLBs - Input/output system, programmed I/O, DMA and interrupts, Buses

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After the successful completion of this course, the student will be able to
- Summarize the basic components of a computer, including CPU, memories, and input/output, and their organization.
- Solve the arithmetic operations of binary number system
- Analyze pipelined control units
- Explain parallel processing concepts and its challenges
- Analyze the performance of various memory

TEXT BOOKS

REFERENCE BOOKS
PRE-REQUISITES:

COURSE OBJECTIVE:

- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram
- To make a study of SQL and relational database design
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design

UNIT I  INTRODUCTION  10
Introduction to File and Database systems – Database system structure - Database users and administrator – Data models – Introduction to Network and Hierarchical Models – ER model – Introduction to Relational database.

UNIT II  RELATIONAL MODEL  10

UNIT III  DATA STORAGE AND QUERY PROCESSING  10

LIST OF EXPERIMENTS:  30
1. Data Definition, Table Creation, Constraints.
2. Insert, Select Commands, Update & Delete Commands.
3. Nested Queries & Join Queries
4. Views
5. High level programming language extensions (Control structures, Procedures and Functions).
6. Front end tools
7. Forms
8. Triggers
9. Menu Design
10. Reports.

TOTAL: 30+30 PERIODS
COURSE OUTCOMES:

- Understand fundamentals of data models and database system using ER diagram.
- Apply the SQL query in relational database
- Choose an appropriate normalization techniques
- Analyze various storage techniques.
- Apply query processing techniques

TEXT BOOKS:


REFERENCE BOOKS:

PRE-REQUISITES:

COURSE OBJECTIVE:
- To describe the working of Internet based applications
- To design and develop demos using Alice tool
- To design and test simple programs in C language
- To document artifacts using common quality standards
- To design simple data store using RDBMS concepts and implement
- To develop a working website with all above learning

UNIT I COMPUTER ARCHITECTURE

UNIT II PROBLEM SOLVING

UNIT III DATA PROCESSING

UNIT IV OBJECT ORIENTED ANALYSIS

UNIT V NETWORKING

TOTAL: 45 PERIODS
COURSE OUTCOMES:
After successful completion of this course, the student will be able to
- Describe working of Internet based applications
- Design and develop demos using Alice tool
- Design and test simple programs in C language
- Document artifacts using common quality standards
- Design simple data store using RDBMS concepts and implement
- Develop a working website with all above learning

TEXT BOOKS

REFERENCE BOOKS:
PRE-REQUISITES:

COURSE OBJECTIVE:
- To design a stylistic webpage using HTML and CSS
- To know the basic knowledge of word press and Dreamweaver
- To validate webpage creation using java script and PHP

UNIT I HTML BASICS  8

UNIT II CASCADING STYLE SHEETS FOR STYLING  10

UNIT III WORD PRESS & ADOBE DREAMWEAVER  8

UNIT IV CLIENT-SIDE PROGRAMMING - JAVA SCRIPT  10

UNIT V SERVER-SIDE PROGRAMMING - PHP  9
Introduction of PHP - Basic Syntax – Expressions and Control flow in PHP - PHP functions and objects - PHP arrays - Accessing MySql using PHP

TOTAL: 45 PERIODS

COURSE OUTCOMES:
After the successful completion of the course students will be able to
- Apply the knowledge of HTML to create webpage
- Make use of CSS style sheet for a web application
- Design and manage pages and posts using Word press and Adobe Dreamweaver
- Identify and Analyze client side programming using java script
- Analyze the server side programming using PHP and identify the database connection
TEXT BOOKS:


REFERENCE BOOKS:

4. http://www.w3schools.com
# MANDATORY COURSES

<table>
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PRE-REQUISITE:
COURSE OBJECTIVES:
- To inculcate the values of Humanism, Culture and to have an awareness of Human Rights
- To impart knowledge and develop a sensitivity to the diverse Indian culture

UNIT I
- Unit I: Introduction – Value education - Definition - Why values? - need for inculcation - sources of values-
  Personal values, Social values, Professional values, Moral values and Behavioral values.

UNIT II
- Unit II: Values needed for life - love & Compassion, Truth & Tolerance, Fairness & Obedience – Respect
  Empathy – Protection – Humility & Harmony – Principles of happy living – Stress management

UNIT III
- Unit III: Social values and personality – Role models – National leaders – freedom fighters, Social reformers &
  Value based anecdotes

UNIT IV
- Unit IV: Social values-Five responsibilities: to self family, environment, society and universe- peace within,
  family & universe; Unethical standards in words and how to correct in deeds, in thought, its deleterious
  effects in society, deterioration of culture and traditional values- remediation for better understanding of
  such values and its implications

UNIT V
  – Peace and non violence – the role of media in value building - Consumer awareness-Case Study

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: