B.E-COMPUTER SCIENCE AND ENGINEERING

CHOICE BASED CREDIT SYSTEM (CBCS)

Syllabus
2017-2018

KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
(Established under section 3 of UGC Act, 1956)

COMPUTER SCIENCE AND ENGINEERING
ENGINEERING

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(Deemed to be University)
(Established under section 3 of UGC Act, 1956)
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COURSE OBJECTIVES:

- To enable students to attain fluency and accuracy to inculcate proficiency in professional communication to meet the growing demand in the field of Global communication.
- To help students acquire their ability to speak effectively in real life situations.
- To inculcate the habit of reading and to develop their effective reading skills.
- To ensure that students use dictionary to improve their active and passive vocabulary.
- To enable students to improve their lexical, grammatical and communicative competence.

LEARNING OUTCOMES:

Students undergoing this course will be able to

- Use English language for communication: verbal & non-verbal.
- Enrich comprehension and acquisition of speaking & writing ability.
- Gain confidence in using English language in real life situations.
- Improve word power: lexical, grammatical and communication competence.

Unit-I LSRW SKILLS & GRAMMAR

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (9)

Listening – Types of listening- Listening to class reading - Video tapes/ Audio tapes. Speaking – Introduction on self. Reading - Reading for comprehension – Reading different kind of passages like descriptive, narrative, objective, conversational and argumentative. Writing – Formal and Informal letters- Letters to the Editor.

Grammar & Vocabulary (Function Grammar & Technical Vocabulary)

Parts of Speech - Tenses - Articles. Vocabulary - Word Formation – Word expansion (Root word) - Prefix and Suffix.

Unit – II LSRW SKILLS & GRAMMAR

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (8)

Grammar & Vocabulary (Function Grammar & Technical Vocabulary)

WH questions – Yes/No Question - Subject Verb agreement. Vocabulary – Compound Nouns/Adjectives – Irregular verbs.

Unit - III LSRW SKILLS & GRAMMAR

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (8)


Grammar & Vocabulary (Function Grammar & Technical Vocabulary)

Preposition – Infinitive & Gerund. Vocabulary – Foreign words used in English – British and American usage.

Unit- IV LSRW SKILLS & GRAMMAR, CAREER ORIENTED

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (10)

Listening – Responding to questions – Reading in class for complete understanding and for better pronunciation. Speaking – Debate- Presentations in seminars. Reading – Making inference from the reading passage – Predicting the content of reading passages. Writing - Interpreting visual materials (tables, graphs, charts, etc) & Instruction writing.

Grammar & Vocabulary (Function Grammar & Technical Vocabulary)

Sentence pattern – Voice (active and passive voice). Vocabulary – One word substitution.

Unit- V LSRW SKILLS & GRAMMAR, FIELD WORK

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (10)


Grammar & Vocabulary (Function Grammar & Technical Vocabulary)

Direct and Indirect speech – Conditional sentences - Auxiliary verbs. Vocabulary – Abbreviations & Acronyms.
Note: Students shall have hands on training in improving listening skill in the language laboratory @ 2 periods per each unit.

Total Hours-45

TEXT BOOK:


REFERENCES:


WEBSITES:

1. www.learnerstv.com – Listening/ Speaking/ Presentation
2. www.usingenglish.com – Writing/ Grammar
3. www.englishclub.com – Vocabulary Enrichment/ Speaking
4. www.ispeakyouspeak.blogspot.com – Vocabulary Enrichment/ Speaking
5. www.teachertube.com – Writing Technically
COURSE OBJECTIVES:
- To develop analytical skills for solving different engineering problems.
- To understand the concepts of Matrices and vector differentiation.
- To solve problems by applying Differential Calculus and Differential equations.

LEARNING OUTCOMES:
The student will be able to
- apply advanced matrix knowledge to Engineering problems.
- improve their ability in solving geometrical applications of differential calculus problems
- improve their ability in vector differentiation.

UNIT I  MATRICES (12)

UNIT II DIFFERENTIAL CALCULUS (12)
Limits, Continuity (Concepts only)- Differentiation- Differentiation Techniques: standard formulae, product rule, quotient rule, chain rule, method of substitution, implicit functions and successive differentiation.

UNIT III GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS (12)

UNIT IV DIFFERENTIAL EQUATIONS (12)
Introduction to Ordinary differential equations: Linear ordinary differential equations of second and higher order with constant coefficients.

Introduction to Partial differential equations: Linear Partial differential equations of second and higher order with constant coefficients.

UNIT V VECTOR DIFFERENTIATION (12)
Vectors-Differentiation of vectors – scalar and vector point functions –vector operator – vector operator applied to scalar point functions: Gradient; vector operator applied to vector point functions: Divergence and curl; Physical interpretation of divergence and curl, solenoidal and irrotational vectors.

Total Hours : 60
TEXT BOOKS:


REFERENCES:


WEBSITES:

1. www.efunda.com
2. www.mathcentre.ac.uk
3. www.intmath.com/matrices-determinants
COURSE OBJECTIVE:

- To enhance the fundamental knowledge in Physics and its applications relevant to various branches of Engineering and Technology

LEARNING OUTCOME:

- The students will have the knowledge on the basics of physics related to properties of matter, fiber optics, quantum, crystal physics and that knowledge will be used by them in different engineering and technology applications

UNIT I PROPERTIES OF MATTER AND THERMODYNAMICS (9)

Three types of modulus of elasticity – basic definitions, relation connecting the modulii (Derivation), Poisson’s ratio- Torsional pendulum- bending of beams - bending moment – uniform and non uniform bending


UNIT II LASER AND FIBER OPTICS (9)

Introduction – emission and absorption process- Einstein’s coefficients derivation. Types of LASER -CO₂, Semiconductor LASER- Applications of LASER in industry and medicine. Total internal reflection – modes of propagation of light in optical fibers – numerical aperture and acceptance angle – derivations, types of optical fibers (Material, refractive index and mode) – fiber optical communication system (block diagram)

UNIT III QUANTUM PHYSICS (9)

Introduction to quantum theory – Black body radiation- dual nature of matter and radiation – de Broglie wavelength, uncertainty principle – Schrödinger’s wave equation – time dependent and time independent equations – particle in one dimensional box- physical significance of wave function, scanning electron microscope.

UNIT IV CRYSTAL PHYSICS (9)

Lattice – unit cell – Bravais lattice – calculation of number of atoms per unit cell, atomic radius, coordination number, packing factor for SC, BCC, FCC and HCP structures- crystal defects – point, line and surface defects

UNIT V ULTRASONICS AND NUCLEAR PHYSICS (9)

Production of ultrasonics by piezoelectric method – Non Destructive Testing – pulse echo system through transmission and reflection modes - A,B and C – scan displays, Medical applications – Sonogram

**Total Hours - 45**

**TEXT BOOK:**


**REFERENCES:**


**WEBSITES:**

1. [www.nptel.ac.in](http://www.nptel.ac.in)
2. [www.physicsclassroom.com](http://www.physicsclassroom.com)
3. [www.oyc.yale.edu](http://www.oyc.yale.edu)
4. [www.physics.org](http://www.physics.org)

*common to semester 1 & 2*
COURSE OBJECTIVES:

- To understand about the water technology.
- To get the information on electrochemical cells, batteries, fuels and combustion.
- To study about the corrosion and protective coatings.
- To gain knowledge on adsorption phenomena.

LEARNING OUTCOME:

- This course will create an impact on the students and make them to realize the modern utility on electrochemical cells, batteries, fuels and combustion process, corrosion and adsorption methods.

UNIT I  WATER TECHNOLOGY  (9)

UNIT II  ELECTROCHEMISTRY AND STORAGE DEVICES  (9)

UNIT III  FUELS AND COMBUSTION  (9)
UNIT IV  CORROSION SCIENCE  

Chemical and Electrochemical corrosion - Galvanic corrosion - Differential aeration corrosion - Corrosion control - Sacrificial anode and Impressed current cathodic methods - Corrosion inhibitors - Protective coatings – Organic coatings-Paints - Constituents and functions –Inorganic coatings- Metallic coatings - Electroplating (Au) and Electro less plating (Ni) - Surface conversion coating - Hot dipping- Anodizing of Al 

UNIT V  SURFACE CHEMISTRY AND PHASE RULE   


Phase Rule: Definition -Phase diagrams – one component water system, two component Ag-Pb system. 

Total Hours: 45 

TEXT BOOKS: 


REFERENCES: 


WEBSITES: 

5. http://www.chem.qmul.ac.uk/surfaces/sec 

*common to semester 1 & 2
COURSE OBJECTIVE:
- To introduce students to the foundations of problem-solving. Also to develop basic programming skills necessary for engineering education.

LEARNING OUTCOMES:
- Develop algorithms for mathematical and scientific problems
- Explore alternate algorithmic approaches to problem solving
- Understand the components of computing systems
- Choose the structures to solve mathematical and scientific problems
- Write programs to solve real world problems using object oriented features

UNIT I  INTRODUCTION  (9)
General problem solving concepts, approaches and challenges, problem solving with computers, problem solving tools: flowcharts, algorithms, data structures, Pseudo code. Various Approaches : Solve by analogy, Decompose the task into smaller subtasks, Building block approach, Merging solutions, Algorithmic thinking, Choice of appropriate data structures, Implementation of the Pseudo-code, implementing the code, Testing the solution

UNIT II  FUNDAMENTAL ALGORITHMS  (9)
Exchanging the Values – Counting – Summation of Set of Number – Factorial Computation – Sine Computation – Fibonacci Sequence – Reversing the Digits of an Integer – Base Conversion – Character to Number Conversion- Algorithm Comparison

UNIT III  FACTORING METHODS  (9)
Finding the Square Root of a Number – Smallest Divisor of an Integer – GCD of Two Integers – Generating Prime Numbers – Computing the Prime Factors of an Integer – Generation of Pseudo-Random Numbers – Raising a Number to a Large Power – Computing the Nth Fibonacci Number- Algorithm Comparison

UNIT IV  ARRAY TECHNIQUES  (9)
Array Order Reversal – Array Counting or Histogramming – Finding the Maximum Number in a Set – Removal of Duplicates from an Ordered Array – Partitioning an Array – Finding the kth Smallest Element– Longest Monotone Subsequence- Algorithm Comparison

UNIT V  MERGING, SORTING AND SEARCHING  (9)
Two Way Merge - Sorting by Selection, Exchange, Insertion, and Partitioning - Binary Search – Hash Searching- Algorithm Comparison

Total Hours: 45
TEXTBOOK

REFERENCES
17BECS105      BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OBJECTIVES:

- To impart the basic knowledge about the Electric circuits.
- To understand the working of various Electrical Machines.
- To know about various measuring instruments.
- To understand the basic concepts in semiconductor devices and digital electronics.

LEARNING OUTCOME:

- The students shall develop an intuitive understanding of the circuit analysis, basic concepts of electrical machines, basics of electronics and be able to apply them in practical situation.

UNIT I      ELECTRIC CIRCUITS & MEASUREMENTS (9)

Ohm’s Law – Kirchoff’s Laws – Steady State Solution of DC Circuits – Introduction to AC Circuits

UNIT II      ELECTRICAL MACHINES (9)

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors,
Single Phase Transformer, single phase induction Motor.

UNIT III     MEASURING INSTRUMENTS (9)

Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters),
Dynamometer type Watt meters and Energy meters.

UNIT IV     SEMICONDUCTOR DEVICES AND APPLICATIONS (9)

and Full wave Rectifiers – Voltage Regulation. Bipolar Junction Transistor – CB, CE, CC Configurations
and Characteristics

UNIT V      DIGITAL ELECTRONICS (9)

Number systems – binary codes - logic gates - Boolean algebra, laws & theorems- simplification of
Boolean expression - implementation of Boolean expressionsusing logic gates - standard forms of Boolean
expression.

Total Hours: 45
TEXT BOOKS

REFERENCES
COURSE OBJECTIVE:
- To provide students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence.

LEARNING OUTCOME:
- The students will be outfitted with hands-on knowledge in quantitative chemical analysis of water quality parameters and corrosion measurement.

LIST OF EXPERIMENTS – CHEMISTRY

1. Estimation of alkalinity of Water sample.
2. Estimation of hardness of Water by EDTA
3. Estimation of chloride in Water sample (Argentometric method)
4. Determination of corrosion rate by weight loss method.
5. Conductometric Titration (Simple acid base).
6. Conductometric Titration (Mixture of weak and strong acids).
7. Conductometric Titration using BaCl₂ vs Na₂ SO₄.
8. pH Titration (acid & base).
9. Potentiometric Titration (Fe²⁺ / KMnO₄ or K₂Cr₂O₇).
10. Estimation of Ferric ion by Spectrophotometry.
11. Determination of water of crystallization of a crystalline salt (Copper sulphate).
12. Determination of molecular weight and degree of polymerization using Viscometry.

Total Hours: 45

*common to semester 1 & 2
COURSE OBJECTIVE:

- To develop basic laboratory skills and demonstrating the application of physical principles.

LEARNING OUTCOME:

- The students will have the knowledge on Physics practical experiments and that knowledge will be used by them in different engineering and technology applications.

LIST OF EXPERIMENTS – PHYSICS

1. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer.
3. Determination of Young’s modulus of the material – Non uniform bending (or) Uniform bending.
5. Spectrometer Dispersive power of a prism.
7. Particle size determination using Diode Laser
10. Determination of thickness of a thin wire – Air wedge method
11. Determination of Band Gap of a semiconductor material.
12. Determination of Specific resistance of a given coil of wire – Wheatstone Bridge

Total Hours: 45

*common to semester 1 & 2
COURSE OBJECTIVES:

- To develop in students, graphic skills for communication of concepts, ideas and design of engineering products.
- To expose them to existing national standards related to technical drawings.

LEARNING OUTCOMES:

On completion of the course the students will be able to:

- perform free hand sketching of basic geometrical constructions and multiple views of objects
- do orthographic projection of lines and plane surfaces.
- draw projections and solids and development of surfaces
- prepare isometric and perspective sections of simple solids
- demonstrate computer aided drafting

UNIT I  INTRODUCTION (9)

Introduction to Engineering Drawing, Bureau of Indian Standards (BIS), Layout of drawing sheets, sizes of drawing sheets, different types of lines used in drawing practice geometric constructions, principles of dimensioning – linear, angular, aligned system, unidirectional system, parallel dimensioning, chain dimensioning, location dimension and size dimension.

UNIT II  SCALES AND PLANE CURVES (8)

SCALES: Reducing Scale, Enlarging Scale, Plain Scale, Diagonal Scale and Vernier Scale. Conics – Construction of Ellipse, Parabola and Hyperbola by eccentricity method

UNIT III  FREE HAND SKETCHING (9)

Representation of Three Dimensional objects – General principles of orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT IV  PROJECTION OF POINTS, LINES AND PLANE SURFACES (8)

Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations – Traces–Projection of polygonal surface and circular lamina inclined to both reference planes.

UNIT V  PROJECTION OF SOLIDS (8)

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

Introduction to Drafting Software/Package (Not for Exam) (3)
Basic operation of drafting packages, use of various commands for drawing, dimensioning, editing, modifying, saving and printing/plotting the drawings. Introduction to 3D primitives.

**Total Hours: 45**

**TEXT BOOKS**
2. VTU A Primer on Computer Aided Engineering Drawing Belgaum 2006

**REFERENCES**

**WEB SITES**
COURSE OBJECTIVE:
- To familiarize with open source office packages
- To write programs for Understand the basic concept of C Programming, and its different modules that includes conditional and looping expressions, Arrays, Strings and Functions.

LEARNING OUTCOMES:
- Study, analyze and understand logical structure of a computer program, and different constructs to develop a program in ‘C’ language

THEORY:
What is computer- Computer Components- What is C- C Character set- Constants, Variables and Keywords-General form of C Program - Relational and Logical Operators - Selection Structures- If and nested if - Switch Case - Loops-Definition and types- Functions- Arrays- Introduction to Strings-Pointers.

PRACTICALS:
1. Working with word Processing, Spreadsheet and presentation software in Linux
2. Programming in Scratch:
   Practicing fundamental concepts of programming like sequence, selection decision statements, working of loops and event driven programming
3. C Programming:
   Practicing programs to get exposure to basic data types, algebraic expressions, Conditional statements, Input and Output Formatting, Decision Statements, Switch Case, Control structures, arrays, Strings and function, implementation of pointers.

REFERENCES:

Total Hours: 45
COURSE OBJECTIVES:

- To help students comprehend the role of listening skills in effective communication.
- To familiarize students with verbal and non-verbal communication.
- To expose students to neutral accent.
- To develop emotional intelligence skills in them for enhancing their self-esteem.
- To assist them in setting goals and developing positive attitude.
- To enable students to acquire decision making skills, problem solving skills and assertive skills.

LEARNING OUTCOMES:

Students undergoing this course will be able to

- Design and deliver a persuasive presentation that convinces the audience of the topic’s relevance and overcomes resistance, using appropriate visual support and adhering to a specified time limit.
- Use a strategic communication model and critical thinking to identify objectives, analyze audiences, and choose the most effective structure and style for delivering strategically sound written and spoken messages.
- Practice principles of effective business writing and document design in all written documents.
- Build an understanding of different organizational cultures, business practices, and social norms to communicate more effectively in domestic and cross-cultural business contexts.
- Develop their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their job.

UNIT I


UNIT II


UNIT III

UNIT - IV

Difference between goals and dreams - SMART goal setting - 3 Ds of goal setting- Determination, Discipline and Direction - Developing the right attitude - Motivation - Intrinsic and Extrinsic motivation - Dealing with change - Dedication - Taking responsibilities - Decision making.

UNIT – V

Intrapersonal skills - Self-analysis - Thought process – Interpersonal skills - Confidence building - Resolving conflicts- Analytical skills - Team Building - Leadership skills - Planning/organizing - Ability to work independently - Professional ethics - Communicating via e-mail. Ethical perspectives and their implications for responsible communication - Proposal Presentation

Total Hours: 45

TEXT BOOK:

1. Meenakshi Raman ; Prakash Singh Business Communication Oxford University Press 2012

REFERENCES:


WEBSITES:

2. www.ispeakyouspeak.blogspot.com
4. www.learning-development.hr.toolbox.com
6. http://mybcommlab.com to test your understanding of the concepts presented in each chapter and explore additional materials that will bring the ideas to life in videos, activities, and an online multimedia e-book.
COURSE OBJECTIVES:

- To motivate learners to acquire listening & speaking skills in both formal and informal context.
- To focus on question forms & to make them understand the importance of using question tags and also the functional use of transformation of sentences.
- To improve their reading habit and to train them in critical and analytical reading.
- To equip them to write for academic as well as work place context.
- To enable students to face interviews.

LEARNING OUTCOMES:

Students undergoing this course will be able to

- Acquire second language: speaking convincingly, expressing their opinions clearly, negotiating and arguing using appropriate communicative strategies.
- Enhance them reading texts critically and analytically.
- Develop writing effectively, persuasively and producing different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
- Enrich the ability to face interviews with confidence.

UNIT-1 LSRW SKILLS & GRAMMAR

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (9)


Grammar & Vocabulary (Function Grammar & Technical Vocabulary)

Regular & Irregular verbs - Kinds of sentences - Question tags. Homonyms and Homophones.

UNIT-II LSRW SKILLS & GRAMMAR

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (9)

Listening – Note Taking- Improving grasping ability. Speaking – Welcome address - Vote of thanks - Master of ceremony. Reading – Active and Passive reading - Reading for vocabulary- Reading for a purpose. Writing - Writing a review (Film review) - Summary of a story. Grammar & Vocabulary (Function Grammar & Technical Vocabulary)
UNIT – III LSRW SKILLS & GRAMMAR

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (9)

**Listening** – Barriers to listening (Physical, Psychological, Linguistic & Cultural). **Speaking** – Stress, Pause and Intonation. **Reading** – Rapid reading – Skimming, Scanning and Surveying. (SQ3R) **Writing** - Essay writing -Minutes of meeting - Agenda

**Grammar & Vocabulary (Function Grammar & Technical Vocabulary)**

Active and Passive voice - Purpose expression. Same words used as noun and verb - Often misspelt and confused words.

UNIT-IV LSRW SKILLS & GRAMMAR, CAREER ORIENTED

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (9)

**Listening** – Listening to telephone conversation - Viewing model interviews. **Speaking** – Group Discussion - Correlation between verbal & non-verbal communication. **Reading** – Reading comprehension (short & long text) - Reading job advertisements and profile of a company. **Writing** – Checklist preparation.

**Grammar & Vocabulary (Function Grammar & Technical Vocabulary)**

**Grammar** - Numerical expressions – Collocations. Singular and Plural (Nouns)

UNIT- V LSRW SKILLS & GRAMMAR, FIELD WORK

Receptive Skills (Listening, Reading and Scanning) & Productive Skills (Writing, Speaking and Representing) (9)

**Listening** – Types of listening- Improving listening comprehension. **Speaking** - Oral presentation - Vocal communication techniques - Voice, quality, volume, pitch etc., **Reading** -Note making - Making notes from books/ any forms of writing materials. **Writing** - Describing process & products - Recommendation writing – Short essays writing-

**Grammar & Vocabulary (Function Grammar & Technical Vocabulary)**

Transformation of sentences (Simple, Compound & Complex).Collection of Technical Vocabularies with their meanings.
Note: Students shall have hands on training in improving listening skill in the language laboratory @ 2 periods per each unit.

Total Hours: 45

TEXT BOOK:


REFERENCES:


WEB SITES:

1. www.learnerstv.com – Listening/ Speaking/ Presentation
2. www.usingenglish.com – Writing/ Grammar
3. www.englishclub.com – Vocabulary Enrichment/ Speaking
4. www.ispeakyouspeak.blogspot.com – Vocabulary Enrichment/ Speaking
5. www.teachertube.com – Writing Technically
COURSE OBJECTIVES:

- To have knowledge in integral calculus and Vector calculus
- To expose to the concept of Analytical function and Complex integration.

LEARNING OUTCOMES:

The student will be able to

- solve problems in Fluid Dynamics, Theory of Elasticity, heat and mass transfer etc.
- find the areas and volumes using multiple integrals
- improve their ability in Vector calculus
- expose to the concept of Analytical function.
- apply Complex integration in their Engineering problems

UNIT I INTEGRAL CALCULUS (12)


UNIT II MULTIPLE INTEGRALS (12)

Double integral – Cartesian coordinates – Polar coordinates – Area as double integrals- Change the order of integration – Triple integration in Cartesian co-ordinates.

UNIT III VECTOR INTEGRATION (12)

Integration of vectors – line integral- surface integral- volume integral- Green’s theorem - Gauss divergence theorem and Stoke’s theorems (Statement Only), hemisphere and rectangular parallelopipeds problems.

UNIT IV ANALYTIC FUNCTIONS (12)

Analytic functions - Cauchy-Riemann equations in Cartesian and polar forms – Sufficient condition for an analytic function (Statement Only) - Properties of analytic functions – Constructions of an analytic function - Conformal mapping: w = z+a, az, 1/z and bilinear transformation.

UNIT V COMPLEX INTEGRATION (12)

Complex Integration - Cauchy’s integral theorem and integral formula (Statement Only) – Taylor series and Laurent series - Residues – Cauchy’s residue theorem (Statement Only) - Applications of Residue theorem to evaluate real integrals around unit circle and semi-circle (excluding poles on the real axis).

Total Hours: 60
TEXT BOOKS:


REFERENCES:


WEBSITES:

1. www.efunda.com
2. www.mathcentre.ac.uk
3. www.sosmath.com/diffeq/laplace/basic/basic.html
4. www.mathworld.wolfram.com
COURSE OBJECTIVES:

- To give a comprehensive insight into natural resources, ecosystem and biodiversity.
- To educate the ways and means of the environment
- To protect the environment from various types of pollution.
- To impart some fundamental knowledge on human welfare measures.

LEARNING OUTCOME:

- Students will prepare themselves to go eco friendly and help preserving the nature and environment.

UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES (9)

Definition, Scope and Importance – Need for public awareness -Forest resources: Use and over-exploitation, deforestation- Water resources-Use and over-utilization of surface and ground water, floods, drought, conflicts over water- Land resources-Land as a resource, land degradation, man induced landslides, soil erosion and desertification –Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources- Food resources-World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture- Energy resources-Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources- role of an individual in conservation of natural resources.

UNIT II ECOSYSTEM (9)

Chemistry and Environment- Environmental segments, Composition and Structure of atmosphere- Concept of an ecosystem- Structure, components and function of an ecosystem Energy flow in the ecosystem – Food chain, Food web and Ecological pyramids, Structure and function of Terrestrial ecosystem (Forest, Desert and Grassland ecosystem) and Aquatic ecosystem (Fresh water and Marine ecosystem)

UNIT III BIODIVERSITY (9)

Introduction to biodiversity, Definition- Genetic diversity, Species diversity and Ecosystem diversity, Biogeographical classification of India, Importance of biodiversity-Value of biodiversity - Hot Spots of biodiversity-Threats to biodiversity - Endangered and Endemic Species of India – Conservation of biodiversity- In-Situ and Ex-Situ conservation of biodiversity.
UNIT IV   ENVIRONMENTAL POLLUTION

Definition – causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution and Thermal pollution. Solid waste management-causes, effects and control measures of urban and industrial wastes– Role of an individual in prevention of pollution–Disaster management-earthquake, tsunami, cyclone and landslides.

UNIT V   SOCIAL ISSUES AND ENVIRONMENT


Total Hours: 45

TEXT BOOKS:

1. Dr. Ravikrishnan, A Environmental Science Sri Krishna Hi tech Publishing Company Private Ltd., Chennai 2012

REFERENCES:


WEBSITES:

2. http://nptel.ac.in/courses.php?disciplineId=120
LEARNING OUTCOMES:
- Write small programs related to simple/moderate mathematical and logical problems in C
- Study, analyze and understand simple data structures and how to use it in C language
- Identify and understand the working of different operating systems like windows and Linux etc.

UNIT I INTRODUCTION TO C LANGUAGE (8)
Character Set, Variables And Identifiers, Keywords- Built-In Data Types- Arithmetic Operators And Expressions, Constants And Literals, Simple Assignment Statement- Basic Input/Output Statement-Simple 'C' Programs, usage of const keyword

UNIT II CONDITIONAL STATEMENTS AND LOOPS (8)
Logical and Relational Operators- If Statement, If-Else Statement- Loops: While Loop, Do While, For Loop- Nested Loops, Infinite Loops- Switch Statement

UNIT III ARRAYS (9)
One Dimensional Arrays- Array Manipulation; Searching, Insertion, Deletion Of An Element From An Array- Finding The Largest/Smallest Element In An Array- Two Dimensional Arrays, -Addition / Multiplication Of Two Matrices- Strings As Array Of Characters.

UNIT IV POINTERS AND FUNCTIONS (10)

UNIT V USER DEFINED DATATYPES AND FILES (10)

Total Hours: 45
REFERENCES:
COURSE OBJECTIVES:

- To provide an awareness to Computing and C Programming
- To know the correct and efficient ways of solving problems
- To learn to develop algorithm for simple problem solving

LEARNING OUTCOMES:

- Able to understand the basic terminology used in computer programming
- Able to write, compile and debug programs in C language.
- Able to use different data types in a computer program.
- Able to design programs involving decision structures, loops and functions.
- Able to understand the dynamics of memory by the use of pointers.

List of Experiments

1. Write a C program to find Factorial of a given number using do while loop.
2. Write a C Program to print Fibonacci series using while loop.
3. Write a C Program to check a given number is Prime or Not.
4. Write a C Program to compute the sum of even numbers for a given n value.
5. Write a C Program to check the given string is Palindrome or Not.
6. Write a C Program to check the given number is Armstrong or Not using functions.
7. Write a C Program to count the number of vowels from the given string using switch case.
8. Write a C Program to read a line of text from keyboard and print the number of characters, words and spaces.
9. Write a C Program to print the student’s record using structure.
10. Write a C Program to find factorial of a number using recursion function.

Total Hours: 45
COURSE OBJECTIVE:
- To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

LEARNING OUTCOMES:
- Ability to fabricate carpentry components and pipe connections including plumbing works.
- Ability to use welding equipments to join the structures
- Ability to fabricate electrical and electronics circuits

PART – A (CIVIL & MECHANICAL)

1. WELDING (6)
   i. Preparation of arc welding of butt joints, lap joints and tee joints.

2. BASIC MACHINING (6)
   i. Simple Turning and Taper turning
   ii. Drilling and Tapping

3. SHEET METAL WORK (6)
   i. Model making – Trays, funnels, etc.

4. DEMONSTRATION ON (4)
   i. Smithy operations
   ii. Foundry operations
   iii. Plumbing Works
   iv. Carpentry Works

PART –B (ELECTRICAL & ELECTRONICS)

5. ELECTRICAL ENGINEERING (10)
   i. Study of electrical symbols and electrical equipments.
   ii. Construct the wiring diagram for Stair case wiring.
   iii. Construct the wiring diagram for Residential house wiring using switches, fuse, indicator, lamp and energy meter.
   iv. Measurement of electrical quantities – voltage, current, power & power factor in R load.
   v. Measurement of energy using single phase energy meter.

6. ELECTRONICS ENGINEERING (13)
   i. Study of Electronic components – Resistor (color coding), capacitors and inductors.
   ii. Soldering practice – Components Devices and Circuits – Using general purpose PCB.
   iii. Study of logic gates AND, OR, NOT, NOR and NAND.
   iv. Study of HWR and FWR.

Total Hours: 45
REFERENCES

17BECS301 DISCRETE STRUCTURES

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COURSE OBJECTIVES:

- To develop critical and analytical thinking.
- Ability to undertake problem identification, formulation and solution.
- Help students to attain the fundamental mathematical knowledge and reasoning skills they need to be successful in upper-level computing subjects.

LEARNING OUTCOMES:

- The student will gain the fundamentals about the logic of a programme.
- Enrichment of the knowledge in applications of expert system, in data base.
- Gaining the adequate concepts in class of functions, lattices, Number theory and graph theory.

UNIT - I SET THEORY AND FUNCTIONS (13)

UNIT - II MATHEMATICAL LOGIC (13)

UNIT - III LATTICES AND BOOLEAN ALGEBRA (12)

UNIT - IV NUMBER THEORY (12)
Theory of Numbers – Prime – Composite – Perfect amicable numbers – The Sieve of Eratosthenes – Number of primes is infinite – Resolution of composite numbers in to prime factors – Divisor of a given number – Euler’s function $\phi(N)$ – Highest power of prime $p$ contained in $n!$ – Congruence – Fermat’s theorem – Generalization of Fermat’s theorem – Wilson’s theorem – Lagrange’s theorem. (Statements and simple problems only)
UNIT – V  GRAPH THEORY                                            (10)
Graphs and graph models – Graph terminology and special types of graphs – Representation graphs and graph-isomorphism – Connectivity – Matrix Representation of Graphs – Trees.

TEXT BOOKS:

REFERENCES:
1. Bernard Kolman, Robert, C., Busby and Sharan Cutler Ross Discrete Mathematical Structures
5. Narsingh Deo Graph Theory with Applications to Engineering and Computer Science PHI Learning Pvt. Ltd., New Delhi. 2004

WEBSITES:
2. www.mathworld.wolfram.com
3. www.nptel.com

Total Hours: 60
COURSE OBJECTIVES:

- Understand the properties of various data structures
- Identify the strengths and weaknesses of different data structures
- Design and employ appropriate data structures for solving computing problems
- Possess the knowledge of various existing algorithms
- Analyze and compare the efficiency of algorithms
- Possess the ability to design efficient algorithms for solving computing problems

LEARNING OUTCOMES:

- An understanding of the basic data structures.
- An understanding of the basic search and sort algorithms.
- The appropriate use of a particular data structure and algorithm to solve a problem.
- The ability to estimate big-O timings.

UNIT-1   Introduction to Data Structures and Algorithms (7)

Arrays, Structures, Pointers to structures and Strings - Algorithm Development - Complexity Analysis - Recursion

UNIT-II   Linear Data Structures (9)

Abstract Data Type (ADT) - Definition - List ADT – Linked List - Operations - Creation - Insertion - Deletion - Doubly Linked List - Stack ADT - Definition - Implementation - Operations and Applications - Queue ADT - Definition - Implementation, Operations and Applications

UNIT-III Sorting and Searching (10)

Bubble sort - Selection Sort - Insertion Sort - Merge Sort - Quick Sort - Running Time analysis of each sort – Linear Search - Binary Search - Hash Search Table

UNIT-IV   Non Linear Data Structures-I (10)


UNIT-V    Non Linear Data Structures-II (9)

Graph - Definition - Terminologies - Graph Representations - Graph Traversals - Basic Algorithms - Shortest Path Algorithm - Minimum Spanning Tree Construction Algorithms - Prim”s and Kruskal”s - Biconnectivity - Graph Applications

Total Hours: 45
TEXT BOOKS:


REFERENCES:


WEBSITES:

COURSE OBJECTIVES:

- To introduce basic postulates of Boolean algebra and shows the correlation between boolean expressions
- To introduce the methods for simplifying Boolean expressions
- To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits
- To introduce the concept of memories and programmable logic devices.
- To illustrate the concept of synchronous and asynchronous sequential circuits

LEARNING OUTCOMES:

- Understand number systems and codes
- Understand basic postulates of Boolean algebra and shows the correlation between Boolean expressions
- Understand the methods for simplifying Boolean expressions
- Understand the formal procedures for the analysis and design of combinational circuits and sequential circuits
- Understand the concept of memories and programmable logic devices.

UNIT -I  BOOLEAN ALGEBRA AND LOGIC GATES  (9)

Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems - Boolean functions – Simplifications of Boolean functions using Karnaugh map and tabulation methods – Logic gates

UNIT- II  COMBINATIONAL LOGIC  (9)

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

UNIT -III  DESIGN WITH MSI DEVICES  (9)

Decoders and encoders - Multiplexers and demultiplexers - Memory and programmable logic - HDL for combinational circuits
UNIT IV  SYNCHRONOUS SEQUENTIAL LOGIC  
Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters - HDL for sequential logic circuits, Shift registers and counters.

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

Total Hours: 45

TEXT BOOKS:

REFERENCES:

WEBSITES:
COURSE OBJECTIVES:

- Understand the concepts of object-oriented, event driven, and concurrent Programming paradigms.
- Develop skills in using these paradigms using Java.
- Analyze and compare the efficiency of algorithms.
- Possess the ability to design efficient algorithms for solving computing problems.

LEARNING OUTCOMES:

- Able to use a simple Java programming environment, compile programs and interpret compiler errors.
- Able to understand and use the fundamental data types.
- Able to design classes and organise them into packages.
- Able to test programs to ensure that they perform as intended.

UNIT I  Fundamentals of Object-Oriented Programming with JAVA (9)


UNIT II  Classes, Objects and Methods (9)

Defining a Class-Creating Objects-Accessing Class Members-Constructors-Methods Overloading-Static Members-Nesting of Methods-Final Variables and Methods- Final Classes- Finalize Methods-Visibility Control

UNIT III  Inheritance and Interfaces (9)

Motivation - Inheritance: Extending a Class – Types of Inheritance - Overriding Methods - Interfaces in Java (Interface and Implement) - Multiple inheritance – Examples

UNIT IV  Managing Errors and Exception Handling (9)


UNIT V  Input /Output Streams (9)

Motivation - I/O Streams - Concept of Streams- Stream Classes- Byte Stream Classes- Character Stream Classes-Using Streams-Other Useful I/O Classes- Using the File Class- Input /Output Exceptions-Creation of Files-Reading/Writing Characters-Reading/Writing Bytes - Handling Primitive Data Types - Concatenating and Buffering Files-Random Access Files-Interactive Input and Output-Other Stream classes.

Total Hours: 45
TEXT BOOKS:

REFERENCES:

WEBSITES:
COURSE OBJECTIVES:

- To have an understanding of foundations of design of assemblers, loaders, linkers, and macro processors.
- To know the design and implementation of assemblers.
- To know the design and implementation of linkers and loaders.
- To have an understanding of macro processors.

LEARNING OUTCOME:

- Learns programming in assembly language, including its relationship to computer architecture, macros, segmentation, memory management, linkages, etc.

UNIT-I Introduction (9)
System software and machine architecture – The Simplified Instructional Computer (SIC) - XE - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT-II Assemblers (9)

UNIT-III Loaders and Linkers (9)

UNIT-IV Macro Processors (9)

Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES:

2. www.tenouk.com/ModuleW.html
17BECS305B  Programming with Java Script

COURSE OBJECTIVES:

- Understand and use basic programming syntax using JavaScript
- Understand and use JavaScript to enhance HTML documents.
- Understand the Java Scripts Object Model.
- Understand and use predefined JavaScript objects.

LEARNING OUTCOMES:

- Describe the origins of JavaScript and list its key characteristics.
- Communicate with users using JavaScript.
- Define and call JavaScript functions.
- Control program flow.
- Identify and use the JavaScript language objects.
- Use JavaScript with HTML form controls.
- Define and utilize cookies.
- Create custom JavaScript objects.

UNIT I  Programming Fundamentals
What is JavaScript? Brief history - Common use cases - Runtime environments - Overview of language features - Running JavaScript in the browser and at the command line - Debugging JavaScript in the browser - Authoring and debugging code - The roles and relationships between HTML, CSS, and JavaScript

UNIT II  The Javascript Language
Basic data types, variables, objects, and mathematical operations - Control structures, conditionals, looping, functions - Data and data structures: Objects, Arrays, Dates and other built-in data objects - More data structures: Functions, objects, and data - JSON - Advanced control structures

UNIT III  Javascript and the behavior of Web pages
Making Web pages behave: manipulating the DOM - Working with Browser Events - Script loading, responding to keyboard input or mouse activity, scrolling - Forms and AJAX - Using Javascript Libraries for Advanced Behavior: jQuery and others - Animations, AJAX, form and data handling

UNIT IV  Javascript Libraries and Advanced Applications
Understanding How Libraries Work - Library Architecture and design patterns - Writing a JQuery plugin - Other kinds of libraries - Media players, layout managers - Writing your own library - Javascript and multimedia

UNIT V  Security

Total Hours: 45
TEXT BOOKS:

REFERENCES:

WEBSITES:
COURSE OBJECTIVES:

- A competence to design, write, compile, test and execute straightforward programs using a high level language;
- An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
- Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
- Demonstrate the ability to use simple data structures like arrays in a Java program.

LEARNING OUTCOMES:

- Understand the principles of OOP;
- Be able to demonstrate good object-oriented programming skills in Java;
- Understand the capabilities and limitations of Java;
- Be able to describe, recognise, apply and implement selected design patterns in Java;
- Be familiar with common errors in Java and its associated libraries.

LIST OF EXPERIMENTS

1. Create Java package with simple stack and queue class
2. Write a Java program to perform Complex number manipulation
3. Write a Java program for Date class similar to java.util package
4. Write a Java program for implementing dynamic polymorphism in java
5. Write a Java program for ADT stack using Java interface
6. Write a Java program for DNA file creation
7. Develop a simple paint like program using applet
8. Develop a scientific calculator using java
9. Developing a template for linked list
10. Develop a multi threaded producer consumer Application
11. Write a Java program for generating prime numbers and Fibonacci series
12. Write a Java program for Multithreaded GUI application

Total Hours: 45
COURSE OBJECTIVES:

- To verify operation of logic gates and flip flops
- To design and construct digital circuits

LEARNING OUTCOMES:

- Able to gain knowledge in designing digital circuits
- Familiarize with design and construction of digital circuits
- Familiarize with simulation of digital circuits using VHDL

LIST OF EXPERIMENTS

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

Total Hours: 45
COURSE OBJECTIVES:

- Analyze performance of algorithms.
- Choose the appropriate data structure and algorithm design method for a specified application.
- Determine which algorithm or data structure to use in different scenarios.
- Demonstrate understanding of the abstract properties of various data structures such as stacks, queues, lists, trees and graphs.
- Demonstrate understanding of various sorting algorithms, including bubble sort, selection sort, heap sort and quick sort.
- Understand and apply fundamental algorithmic problems including Tree traversals.
- Graph traversals, and shortest paths.
- Program multiple file programs in a manner that allows for reusability of code.

LEARNING OUTCOMES:

- Able to understand the importance of structure and abstract data type, and their basic usability in different applications through different programming languages.
- Able to analyze and differentiate different algorithms based on their time complexity.
- Able to understand the linked implementation, and its uses both in linear and non-linear data structure.
- Able to understand various data structure such as stacks, queues, trees, graphs, etc. to solve various computing problems.

LIST OF EXPERIMENTS

1. Implementation of List using Arrays
2. Implementation of Singly Linked List
3. Implementation of Linked Stack
4. Implementation of Linked Queue
5. Implementation of any two stack applications
6. Implementation of Insertion Sort
7. Implementation of Merge Sort
8. Implementation of Quick Sort
9. Implementation of Insertion operation in Binary Search Tree
10. Implementation of Tree Traversals
11. Implementation of Hashing with any one collision resolution method
12. Implementation of Dijkstra’s Shortest Path Algorithm

Total Hours: 45
COURSE OBJECTIVES:

- Understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- Learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- Know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- Possess the knowledge about the emerging trends in the area of distributed DB- OO DB- Data mining and Data Warehousing and XML.

LEARNING OUTCOMES:

On successful completion of this module, the student should:

- Have gained knowledge and understanding of what is involved in the design of a database.
- Have gained knowledge and understanding of the models used for structuring data in database systems.
- Be able to implement a database and report on the process.
- Be able to query a database.

UNIT-I  Introduction and Conceptual Modeling


UNIT-II  Relational Model

SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design-Relational Models-Design issues – Functional dependences and Normalization for Relational Databases (up to BCNF).

UNIT- III  Data Storage and Query Processing


UNIT- IV  Transaction Management

UNIT- V  Current Trends


Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES:

COURSE OBJECTIVES:

- To discuss the basic structure of a digital computer and to study in detail the organization of the Control unit, the Arithmetic and Logical unit, the Memory unit and the I/O unit.
- To have a thorough understanding of 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 and floating-point addition, subtraction, multiplication & division.
- To study in detail the different types of control and the concept of pipelining.

LEARNING OUTCOMES:

The main goal of the course is for students to:

- Be able to understand simple circuits from logic formula.
- Understand the basics of assembly language.
- Understand the main concepts of computer architecture
- Be able to explain how the various parts of a modern computer function and cooperate.
- Be able to exploit the advantages of an advanced computer memory having virtual memory and Cache.
- Implement assembly programs that accomplish basic computational and I/O operations.

UNIT- I    Basic structure of computers (9)
Functional units - Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT- II    Arithmetic unit (9)
Addition and substraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT- III    Basic processing unit (9)

UNIT- IV    Memory system and i/o organization (9)
UNIT- V Multiprocessor architecture


Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES:

1. www.eastaughs.fsnet.co.uk/cpu/structure-alu.htm
COURSE OBJECTIVES:

- To introduce the h/w architecture, instruction set and programming of 8086 microprocessor.
- To introduce the peripheral interfacing of microprocessors.
- To introduce the h/w architecture of ARM processor.
- To introduce the h/w architecture, instruction set, programming and interfacing of 8051 microcontroller.

LEARNING OUTCOMES:

- Adequate knowledge about the architecture and programming of 8085 microprocessor.
- Adequate knowledge about the architecture of ARM processor.
- Adequate knowledge about the architecture and programming of 8086 microprocessor.
- Adequate knowledge about the architecture, programming and interfacing of 8051 microcontroller.

UNIT -I  THE 8085 MICROPROCESSOR (9)
Introduction to 8085 – Microprocessor architecture – Instruction set – Programming the 8085 – Code conversion.

UNIT- II  8086 SOFTWARE ASPECTS (9)

UNIT- III  8086 SYSTEM DESIGN (9)
8086 signals and timing – MIN/MAX mode of operation – Addressing memory and I/O – Multiprocessor configurations – System design using 8086

UNIT- IV  I/O INTERFACING (9)
Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications.
UNIT- V  MICROCONTROLLERS

Architecture of 8051 – Signals – Operational features – Memory and I/O addressing – Interrupts – 
Instruction set – Applications.

Total Hours: 45

TEXT BOOKS:

1. Ramesh S.Gaonkar Microprocessor– Architecture Programming and Applications with the 8085 
Penram International publishing private limited. 2008
2. Ray A.K & K.M.Bhurchandi Advanced Microprocessors and peripherals– Architectures 
Programming and Interfacing TMH 2006

REFERENCES:

1. Douglas V.Hall Microprocessors and Interfacing Programming and Hardware TMH
2. 2003
3. Yu-cheng Liu Glenn A.Gibson Microcomputer systems: The 8086 / 8088 Family architecture, 
Programming and Design, PHI 2008
4. Mohamed Ali Mazidi, Janice Gillispie Mazidi The 8051 microcontroller and embedded systems, 
Pearson education 2007

WEBSITES:

COURSE OBJECTIVES:

- Evaluate storage architectures and key data center elements in classic, virtualized and cloud environments.
- Explain physical and logical components of a storage infrastructure including storage subsystems, RAID and intelligent storage systems.
- Describe storage networking technologies such as FC-SAN, IP-SAN, FCoE, NAS and object-based, and unified storage.
- Understand and articulate business continuity solutions – backup and replications, along with archive for managing fixed content.
- Explain key characteristics, services, deployment models, and infrastructure components for a cloud computing environment.

LEARNING OUTCOMES:

- Describe and apply storage technologies.
- Identify leading storage technologies that provide cost-effective IT solutions for medium to large scale businesses and data centers.
- Describe important storage technologies’ features such as availability, replication, scalability and performance.
- Work in project teams to install, administer and upgrade popular storage solutions.
- Identify and install current storage virtualization technologies.
- Manage virtual servers and storage between remote locations.

UNIT I  Storage System  (9)

Introduction to information storage, Virtualization and cloud computing, Key data center elements, Compute, application, and storage virtualization, Disk dive & flash drive components and performance, RAID, Intelligent storage system and storage provisioning (including virtual provisioning).

UNIT II  Storage Networking Technologies and Virtualization  (9)

Fibre Channel SAN components, FC protocol and operations, Block level storage virtualization, iSCSI and FCIP as an IP-SAN solutions, Converged networking option – FCoE, Network Attached Storage (NAS) – components, protocol and operations, File level storage virtualization, Object based storage and unified storage platform.

UNIT III  Backup, Archive and Replication  (9)

Business continuity terminologies, planning and solutions, Clustering and multipathing to avoid single points of failure, Backup and recovery – methods, targets and topologies, data deduplication and backup in virtualized environment, fixed content and data archive, Local replication in classic and virtual environments, Remote replication in classic and virtual environments, Three-site remote replication and continuous data protection.
UNIT IV    Cloud Computing    (9)

Characteristics and benefits, Services and deployment models, Cloud infrastructure components, Cloud migration considerations.

UNIT V    Securing and Managing    (9)

Storage Infrastructure Security threats, and countermeasures in various domains, Security solutions for FC-SAN, IP-SAN and NAS environments, Security in virtualized and cloud environments, Monitoring and managing various information infrastructure components in classic and virtual environments, Information lifecycle Management (ILM) and storage tiering.

Total Hours: 45

TEXT BOOKS:


REFERENCES:


2. Information Storage and Management: Storing, Managing, and Protecting Digital Information, EMC Education Services, Wiley, January 2010
COURSE OBJECTIVES:

The student should be made to:

- Learn the algorithm analysis techniques.
- Become familiar with the different algorithm design techniques.
- Understand the limitations of Algorithm power.
- Develop a base for advanced study in Computer Science.

LEARNING OUTCOMES:

At the end of the course, the student should be able to:

- Design algorithms for various computing problems.
- Analyze the time and space complexity of algorithms.
- Critically analyze the different algorithm design techniques for a given problem.
- Ability to decide the appropriate data type and data structure for a given problem.
- Ability to select the best algorithm to solve a problem by considering various problem characteristics, such as the data size, the type of operations, etc.

UNIT I INTRODUCTION


UNIT II BRUTE FORCE AND DIVIDE-AND-CONQUER


UNIT III DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE


UNIT IV BACK TRACKING AND BRANCH AND BOUND

UNIT V  NP HARD AND NP COMPLETE

Basic Concepts- Non Deterministic algorithms-NP Hard and NP Complete Classes-Cool’s Theorem

Total Hours: 45

TEXT BOOK:

REFERENCES:
4. http://nptel.ac.in/
COURSE OBJECTIVES:

- To have an introductory knowledge of automata, formal language theory and computability.
- To have an understanding of finite state and pushdown automata.
- To have a knowledge of regular languages and context free languages.
- To know the relation between regular language, context free language and corresponding recognizers.
- To study the Turing machine and classes of problems.

LEARNING OUTCOMES:

- To have an introductory knowledge of automata, formal language theory and computability.
- To have an understanding of finite state and pushdown automata.
- To have a knowledge of regular languages and context free languages.
- To know the relation between regular language, context free language and corresponding recognizers.
- To study the Turing machine and classes of problems.

UNIT- I  Introduction To Automata  

Basics of String and Alphabets - Finite Automata (FA) – Deterministic Finite Automata (DFA)– Non-deterministic Finite Automata (NFA) – Conversion of NFA to DFA- Finite Automata with Epsilon transition-Equivalence and Minimization of Automata

UNIT- II  Regular Expressions And Languages  

Regular Expression – FA and Regular Expressions – Proving languages not to be regular –Pumping lemma for regular sets - Closure properties of regular languages- Decision Properties of Regular Languages

UNIT- III  Context-Free Grammar And Languages  


UNIT IV  Properties of Context Free Grammar  

Normal forms for Context Free Grammar- Chomsky Normal Form- The Pumping lemma for Context free Languages- Closure properties of Context Free Languages-Inverse Homomorphism-Decision Properties of CFL
UNIT- V Turing Machine

Turing Machines – Introduction- Definition – Turing machine construction- Storage in Finite control- Multiple tracks- Subroutines- Checking of Symbols – Two way infinite tape- Undecidability .

Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES:

COURSE OBJECTIVES:

- Understand the concepts of object-oriented, event driven, and concurrent programming paradigms
- Develop skills in using these paradigms using Java.

LEARNING OUTCOMES:

After completion of this course, the students would be able to

- concurrent object-oriented programming in Java
- event-driven programming
- event handling in the context of Java GUI programming

Theory:
Creating Threads-Extending the Thread Class- Thread states -Stopping and Blocking a Thread-Life Cycle of a Thread- Thread Exceptions- Thread Priority- Synchronization


Preparing to Write Applets-Building Applet Code-Applet Life Cycle-Creating an Executable Applet-Designing a Web Page-Applet Tag-Adding Applet to HTML File-Running the Applet-Getting Input from the User-Event Handling-The Graphics Class

Sockets – secure sockets – custom sockets –Java Messaging services


List of Experiments

- Write a java program to implement the concept of threading by extending Thread Class
- Write a java program to implement the concept of thread priority.
- Write a java program to implement the methods of thread States.
- Write a java program to implement the concept of thread Synchronization.
- Write a java program to implement the concept of Object Cloning.
- Write a java program to implement the concept of Reflection.
- Write a java program to implement the concept of inner Classes.
- Write a java program to implement the concept of Generic Classes and Generic Methods.
- Write a Java Program to demonstrate Keyboard event in Applet
- Write a Java Program to demonstrate Mouse events in Applet.
- Write a Java Program to draw different shapes using Graphics Class in Applet
- Write a Java program to create Client-Server network for Chatting between Client and Server.
- Write a java program and test that program using JUnit Testing in Eclipse
TEXT BOOKS:

REFERENCES:

WEBSITES:

\[
\text{Total Hours: 45}
\]
COURSE OBJECTIVES:

- Master the basic concepts and appreciate the applications of database systems.
- Master the basics of SQL and construct queries using SQL.
- Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.
- Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
- Master sound design principles for logical design of databases, including the E-R method and normalization approach.
- Master the basics of query evaluation techniques and query optimization.

LEARNING OUTCOMES:

After completion of this course, the students would be able to

- Understand, appreciate and effectively explain the underlying concepts of database technologies.
- Design and implement a database schema for a given problem-domain.
- Normalize a database.
- Populate and query a database using SQL DML/DDL commands.
- Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS.
- Programming PL/SQL including stored procedures, stored functions, cursors, packages.
- Design and build a GUI application.

LIST OF EXPERIMENTS

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High-level language extension with Triggers.
5. Procedures and Functions.
6. Embedded SQL.
7. Database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.
11. Database connectivity using JDBC.
12. Database connectivity using ODBC.

Total Hours: 45
COURSE OBJECTIVES:
- Describe what makes a system a real-time system.
- Explain the presence of and describe the characteristics of latency in real-time systems.
- Summarize special concerns that real-time systems present and how these concerns are addressed.

LEARNING OUTCOMES:
- Students have knowledge about the applications of embedded systems
- Students have knowledge about the development of embedded software

List of Experiments

1. Use of 8-bit and 32-bit Microcontrollers (such as 8051 Microcontroller, ARM2148 / ARM2378, LPC 2141/42/44/46/48), Microcontroller and C – compiler (Keil), Arduino IDE:
   I) Interface Input – Output and other units such as: Relays, LEDs, LCDs, Switches, keypads, Stepper Motors, Sensors, ADCs, Timers.
   II) Demonstrate Communications: RS232, IIC and CAN protocols,
   II) Develop Control Applications such as: Temperature controller, Elevator controller, Traffic Controller.

2. Development and Porting of Real time applications on to Target machines such as Intel or other Computers using any RTOS.
   I) Understanding Real Time Concepts using any RTOS through demonstration of:
      a) Timing
      b) Multi-tasking
      c) Semaphores
      d) Message Queues
      e) Round-Robin Task Scheduling
      f) Preemptive Priority based Task Scheduling
      g) Priority Inversion
      h) Signals
   II) Applications development using any RTOS:
      a) Any RTOS Booting.
      b) Application Development under any RTOS.
TEXT BOOKS:

REFERENCES:
COURSE OBJECTIVES:

- To have a thorough knowledge of processes, scheduling concepts, memory management, I/O and file systems in an operating system.
- To have an overview of different types of operating systems.
- To know the components of an operating system.
- To have a thorough knowledge of process management.
- To have a thorough knowledge of storage management.
- To know the concepts of I/O and file systems.

LEARNING OUTCOMES:

- Understand device and I/O management functions in operating systems as part of a uniform device abstraction.
- Have an understanding of disk organization and file system structure.
- Be able to give the rationale for virtual memory abstractions in operating systems.
- Understand the main principles and techniques used to implement processes and threads as well as the different algorithms for process scheduling.
- Understand the main mechanisms used for inter-process communication.
- Understand the main problems related to concurrency and the different synchronization mechanisms available.

UNIT- I  Introduction  (9)


UNIT –II  Scheduling  (9)


UNIT- III  Deadlocks  (9)

UNIT- IV Virtual Memory


UNIT- V File Systems


TEXT BOOKS:

REFERENCES:

WEBSITES:
2. www.ee.surrey.ac.uk/Teaching/Unix/
17BECS502 Computer Networks

COURSE OBJECTIVES:
- Understand the division of network functionalities into layers.
- Be familiar with the components required to build different types of networks
- Be exposed to the required functionality at each layer
- Learn the flow control and congestion control algorithms

LEARNING OUTCOMES:
- To introduce the concepts, terminologies and technologies used in modern days data communication and computer networking.
- To understand the concepts of data communications.
- To study the functions of different layers.
- To introduce IEEE standards employed in computer networking

UNIT- I Fundamentals & Link layer (9)
Building a network - ISO / OSI model - Requirements - Layering and protocols - Internet Architecture - Network software - Performance ; Link layer Services - Framing - Error Detection - Flow control

UNIT –II Media access & Internetworking (9)
Media access control - Ethernet (802.3) - Wireless LANs - 802.11 - Bluetooth - Switching and bridging - Basic Internetworking (IP, CIDR, ARP, DHCP, ICMP )

UNIT –III Routing (9)
Routing (RIP, OSPF, metrics) - Switch basics - Global Internet (Areas, BGP, IPv6), Multicast - addresses - multicast routing (DVMRP, PIM)

UNIT- IV Transport layer (9)
Overview of Transport layer - UDP - Reliable byte stream (TCP) - Connection management - Flow control - Retransmission - TCP Congestion control - Congestion avoidance (DECbit, RED) - QoS - Application requirements

UNIT –V Application layer (9)
Traditional applications -Electronic Mail (SMTP, POP3, IMAP, MIME) - HTTP - Web Services - DNS – SNMP

TEXT BOOKS:

Total Hours: 45
REFERENCES:

WEBSITES:
COURSE OBJECTIVES:

- To introduce the methodologies involved in the development and maintenance of software over its entire life cycle.
- To be aware of Different life cycle models and requirement dictation process

LEARNING OUTCOMES:

- Plan and deliver an effective software engineering process, based on knowledge of widely used development lifecycle models.
- Employ group working skills including general organization, planning and time management and inter-group negotiation.
- Translate a requirements specification into an implementable design, following a structured and organised process.
- Formulate a testing strategy for a software system, employing techniques such as unit testing, test driven development and functional testing.
- Evaluate the quality of the requirements, analysis and design work done during the module.

UNIT -I Software Process (9)


UNIT- II Software Requirements (9)


UNIT- III Design Concepts and Principles (9)


UNIT- IV Testing (9)

UNIT- V Software Project Management


Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES:

COURSE OBJECTIVES:

- Understand fundamental underlying principles of computer networking
- Understand details and functionality of layered network architecture
- Apply mathematical foundations to solve computational problems in computer networking
- Utilizing Network tools and simulator

LEARNING OUTCOMES:

- Understands computer networking concepts and vocabulary
- Understands the concept of protocols
- Has received experience with real implementations of the concepts

LIST OF EXPERIMENTS

1. Implementation of Sliding Window Protocol.
2. Study of Socket Programming and Client - Server model
3. Write a code simulating ARP /RARP protocols.
4. Write a code simulating PING and TRACEROUTE commands
5. Create a socket for HTTP for web page upload and download.
6. Write a program to implement RPC (Remote Procedure Call)
7. Implementation of Subnetting .
8. Applications using TCP Sockets like Echo client and echo server
9. Applications using TCP and UDP Sockets like File Transfer
10. Study of Network simulator (NS3), Wireshark

Total Hours: 45
COURSE OBJECTIVES:

- Grasp a fundamental understanding of computer and operating systems
- Learn basic shell programming
- Understand memory management
- Understand process concurrency and synchronization
- Learn the scheduling policies of operating systems

LEARNING OUTCOMES:

- Identify the services provided by operating system
- Understand the internal structure of an operating system and be able to write programs
- Understand and solve problems involving key concepts and theories in operating systems

LIST OF EXPERIMENTS

(Implement the following on LINUX platform. Use C for high level language implementation)

1. Shell programming  
   - command syntax  
   - write simple functions  
   - basic tests
2. Shell programming  
   - loops  
   - patterns  
   - expansions  
   - substitutions
3. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
4. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
5. Write C programs to simulate UNIX commands like ls, grep, etc.
6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
7. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
8. Implement the Producer – Consumer problem using semaphores.
9. Implement some memory management schemes – I
10. Implement some memory management schemes – II
11. Case study: “awk” Scripting Language

Total Hours: 45
COURSE OBJECTIVE:

The objectives of the course are to:

- Practicing the different types of case tools such as Rational Rose / other Open Source to be used for all the phases of Software development life cycle.

LEARNING OUTCOME:

- The students understands the process to be followed in the software development life cycle

LIST OF EXPERIMENTS

1. Implementation of Student Marks Analyzing System
2. Implementation of Quiz System
3. Implementation of Online Ticket Reservation System
4. Implementation of Payroll System
5. Implementation of Course Registration System
6. Implementation of Expert Systems
7. Implementation of ATM Systems
8. Implementation of Stock Maintenance

Total Hours: 45
COURSE OBJECTIVES:
- At the end of the course the student will be able to design and implement a simple compiler.
- To understand, design and implement a lexical analyzer.
- To understand, design and implement a parser.
- To understand, design code generation schemes

LEARNING OUTCOMES:
To be able to:
- Build lexical analyzers and use them in the construction of parsers;
- Express the grammar of a programming language;
- Build syntax analyzers and use them in the construction of parsers;
- Perform the operations of semantic analysis;
- Discuss the merits of different optimization schemes.

UNIT- I   Introduction to compiling
(9)

UNIT- II   Syntax Analysis
(9)

UNIT –III  Intermediate code generation
(9)

UNIT- IV   Code generation
(9)

UNIT- V   Code optimization and run time environments
(9)

Total Hours: 45
TEXT BOOKS:


REFERENCES:


WEBSITES:

2. http://www.mactech.com/articles/mactech/Vol.06/06.04/LexicalAnalysis/index.html
COURSE OBJECTIVES:

- Encryption techniques and key generation techniques
- Authentication and security measures
- Intrusion and filtering analysis

LEARNING OUTCOMES:

The main goal of the course is for students to:

- Identify some of the factors driving the need for network security.
- Identify and classify particular examples of attacks.
- Identify physical points of vulnerability in simple networks.

UNIT I     Conventional and Modern Encryption


UNIT II     Public Key Encryption

Number Theory – Prime number – Modular arithmetic – Euclid”s algorithm – Fermat”s and Euler”s theorem – Primality – Chinese remainder theorem – Discrete logarithm – Public key cryptography and RSA – Key distribution – Key management – Diffie Hellman key exchange – Elliptic curve cryptography

UNIT III     Authentication


UNIT IV     Security Practice

Authentication applications – Kerberos – X.509 Authentication services - E-mail security – IP security - Web security

UNIT V     System Security

Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls design principles – Trusted systems – Practical implementation of cryptography and security

Total Hours: 45
TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVES:

- Understand the advanced concepts of wireless mobile networks
- Apply transactions for complex models
- Explore the modern design structures of pervasive computing
- Analyze various advanced mobile network models

LEARNING OUTCOMES:

- Outline the basic problems, performance requirements of pervasive computing applications and the trends of pervasive computing and its impacts on future computing applications and society.
- Analyze and compare the performance of different data dissemination techniques and algorithms for mobile real-time applications.
- Analyze the performance of different sensor data management and routing algorithms for sensor networks.
- Develop an attitude to propose solutions with comparisons for problems related to pervasive computing system through investigation.

UNIT I  Introduction to Mobile Computing

Mobility of bits and bytes – Wireless the beginning – Mobile computing- Dialogue control-Networks – Middleware and gateways- Application and services- Developing mobile computing applications-Security- Standards- Players in wireless space- Architecture for mobile computing-Three tier architecture- Design considerations-Mobile computing through internet-Making existing applications mobile enabled-Developing IVR application.

UNIT II  Mobile Technologies


UNIT III  Mobile Networking Wireless


UNIT IV  Introduction to Pervasive Computing

UNIT V Pervasive Computing Application Device


Total Hours - 45

TEXT BOOKS:


REFERENCES:


COURSE OBJECTIVES:

- Artificial Intelligence aims at developing computer applications, which encompasses perception, reasoning and learning and to provide an in-depth understanding of major techniques used to simulate intelligence.
- To provide a strong foundation of fundamental concepts in Artificial Intelligence.
- To provide a basic exposition to the goals and methods of Artificial Intelligence.
- To enable the student to apply these techniques in applications which involve perception, reasoning and learning.

LEARNING OUTCOMES:

- Understand the history, development and various applications of artificial intelligence.
- Familiarize with propositional and predicate logic and their roles in logic programming.
- Understand the programming language Prolog and write programs in declarative programming style.
- Learn the knowledge representation and reasoning techniques in rule-based systems, case based systems, and model-based systems.
- Appreciate how uncertainty is being tackled in the knowledge representation and reasoning process, in particular, techniques based on probability theory and possibility theory (fuzzy logic).

UNIT I Introduction and Problem Solving


UNIT II Informed Search and Game Playing


UNIT III Knowledge and Reasoning

UNIT IV  Acting Logically


UNIT V  Learning and Communication


Total hours: 45

TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVES:

- To serve as an introductory course to undergraduate students with an emphasis on the design aspects of Data Mining and Data Warehousing.
- To introduce the concept of data mining with in detail coverage of basic tasks, metrics, issues, and implication.
- To introduce the concept of data warehousing with special emphasis on architecture and design.

LEARNING OUTCOMES:

- Understand why there is a need for data warehouse in addition to traditional operational database system.
- Identify components in typical data warehouse architectures.
- Understand why there is a need for data mining and in what ways it is different from traditional statistical techniques.
- Understand the details of different algorithms.
- Solve real data mining problems to find interesting patterns.
- Understand a typical knowledge discovery process.

UNIT I DATA WAREHOUSING (9)


UNIT II BUSINESS ANALYSIS (9)


UNIT III DATA MINING (9)


UNIT IV ASSOCIATION RULE MINING AND CLASSIFICATION (9)

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 Backpropagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction - Measuring the Dispersion of Data: Range, Quartiles, Variance, Standard Deviation, and Interquartile Range using WEKA.
UNIT V CLUSTERING AND APPLICATIONS AND TRENDS IN DATA MINING (9)
Cluster Analysis - Types of Data – Categorization of Major Clustering Methods - K- means – Partitioning Methods – Hierarchical Methods - Density-Based Methods – Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data - Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications. Use WEKA for cleaning and integration

Total hours:45

TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVES:

- To understand the concepts of object oriented analysis and design
- To understand the object oriented life cycle.
- To know how to identify objects, relationships, services and attributes through UML.

LEARNING OUTCOMES:

- To understand the use-case diagrams.
- To know the Object Oriented Design process.
- To know about software quality and usability.

UNIT- I INTRODUCTION (9)


UNIT- II OBJECT ORIENTED METHODOLOGIES (9)


UNIT- III OBJECT ORIENTED ANALYSIS (9)

Identifying use cases - Object Analysis - Classification – Identifying Object relationships - Attributes and Methods.

UNIT- IV OBJECT ORIENTED DESIGN (9)


UNIT- V SOFTWARE QUALITY AND USABILITY (9)

Designing Interface Objects – Software Quality Assurance – System Usability - Measuring User Satisfaction

Total hours:45

TEXT BOOKS:
2. Martin Fowler Martin Fowler PHI/Pearson Education 2007
REFERENCES:


COURSE OBJECTIVES:

- Learn to program and programming paradigms brought in by Python with a focus on File Handling and Regular Expressions.

LEARNING OUTCOMES:

- Able to walk through the algorithm
- Improve programming skills
- Appreciate Python Programming Paradigm
- Hands on Regular Expression
- Write to file handling scripts

Theory Introduction and overview (10)

Introduction, What is Python, Origin, Comparison, Comments, Operators, Variables and Assignment, Numbers, Strings, Lists and Tuples, Dictionaries, if Statement, while Loop, for Loop and the range() Built-in Function, Files and the open() Built-in Function, Errors and Exceptions, Functions, Classes, Modules. Syntax and Style Statements and Syntax, Variable Assignment, Identifiers, Basic Style Guidelines, Memory Management, Python Application Examples.

LIST OF EXPERIMENTS:

1. Create a calculator program.
2. Explore String functions.
3. Implement sequential search.
4. Implement Selection sort.
5. Implement Stack.
6. Creating a CSV File based on user input.
7. Reading a CSV File already created and check for a specific pattern.

Total Hours: 45

REFERENCES:

COURSE OBJECTIVES:

- Use various symbolic knowledge representations to specify domains and reasoning tasks of a situated software agent.
- Use different logical systems for inference over formal domain representations, and trace how a particular inference algorithm works on a given problem specification.
- Use key logic-based techniques in a variety of research settings

LEARNING OUTCOME:

- Communicate scientific knowledge at different levels of abstraction

LIST OF EXPERIMENTS:

1. Implementation of Decision tree
2. Implementation of Regression Models
3. Implementation of Multi-Layer Perceptron
4. Classification using SVM
5. Implementation of Ada Boosting
6. Bagging using Random forests
7. Implementation of PCA for Dimensionality Reduction
8. Implementation of Factor Analysis
9. Implementation of K-Nearest Neighbor
10. Implementation of Hidden Markov modeling

Total Hours: 45
COURSE OBJECTIVE:

- To enable the students to create an awareness on engineering ethics, to install moral and social values and loyalty and to appreciate the rights of others.

LEARNING OUTCOMES:

- To Discuss and communicate the management evolution and how it will affect future managers.
- Identify and evaluate social responsibility and ethical issues involved in business situations and logically articulate own position on such issues.
- To Practice the process of management's four functions: planning, organizing, leading, and controlling.
- To evaluate leadership styles to anticipate the consequences of each leadership style.
- To understand the nature of professional responsibility and be able to identify the ethical elements in decisions.
- To develop critical thinking skills and professional judgment and understand practical difficulties of bringing about change.
- To develop a professional ethical identity to carry forward in their working life.
- To Demonstrate the ability to provide a self-analysis in the context of an entrepreneurial career
- To Demonstrate the ability to find an attractive market that can be reached economically.

UNIT I ENGINEERING ETHICS (9)


UNIT II FACTORS OF CHANGES (9)

Forces that shape culture, social control – Meaning, Agencies, Institution, Customs, Values, Folkways, Norms and Laws. Social changes – Meaning and nature – Theories.

UNIT III HISTORICAL DEVELOPMENT, PLANNING, ORGANISING (9)

UNIT IV  DIRECTING AND CONTROLLING  (9)


UNIT V  ENTREPRENEURSHIP AND MOTIVATION  (9)


TEXT BOOKS:


REFERENCES:


WEBSITES:

COURSE OBJECTIVES:

- To learn the basic web concepts and Internet protocols.
- To understand CGI Concepts & CGI Programming.
- To familiarize with Scripting Languages.
- To study DHTML, XML, SERVELETS AND JSP.

LEARNING OUTCOMES:

- Demonstrate an understanding of the components of a computer information networked system, including application and software, communication protocols, and networking hardware and software.
- Create, install and update sophisticated web sites. Install and manage server software and other server side tools.
- Demonstrate critical thinking in the understanding, evaluation and application of technology solutions to a variety of real-life situations.
- Articulate ethical and professional standards as they apply to the use of the computer systems and computer based data.

UNIT I Introduction (9)


UNIT II Common gateway interface programming (9)


UNIT III Scripting languages (9)


UNIT IV Dynamic HTML (9)

UNIT V Servlets and JSP

JSP Technology Introduction-JSP and Servelets- Running JSP Applications Basic JSP- JavaBeans Classes and JSP-Tag Libraries and Files- Support for the Model-View- Controller Paradigm- Case Study-Related Technologies.

Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES:

2. www.comptechdoc.org/
COURSE OBJECTIVES:

- To learn the basic web concepts and Internet protocols.
- To develop web page using HTML
- To familiarize with Scripting Languages.
- To study DHTML, XML, SERVELETS AND JSP.

LEARNING OUTCOMES:

- Create, install and update sophisticated web sites.
- Install and manage server software and other server side tools.
- Articulate ethical and professional standards as they apply to the use of the computer systems and computer based data.

LIST OF EXPERIMENTS

1. Develop a web page using HTML with containing map with hot spots that hyperlinks to related information.
2. Develop a web page and use various CSS formatting options on the text.
3. Develop a web page and use external CSS formatting with different formatting options than the ones” used in the previous experiment.
4. Develop a XSL parser for an XML document for data display.
5. Using CSS to format an XML Document
6. Develop a mechanism to validate user input at the client side using JavaScript.
7. Program to set a cookie using JavaScript
8. Develop a computer program that utilizes Java Applet technology to demonstrate some functions.
9. Developing a Java Applet that utilizes the Sound function and is included in the HTML document
10. Develop a mini web application of your choosing.

Total Hours: 45
COURSE OBJECTIVES:

- To explain the basics of software testing
- To highlight the strategies for software testing
- To stress the need and conduct of testing levels
- To identify the issues in testing management
- To bring out the ways and means of controlling and monitoring testing activity

LEARNING OUTCOMES:

- Understand complete software testing life cycle.
- Demonstrate understanding of various terms and technologies used in testing domain.
- Demonstrate understanding of usage of testing framework, process and test management.
- Demonstrate understanding of generating test plan and designing test cases.
- Demonstrate understanding of test management process.
- Given a business scenario, identify and write the test plan, design test cases, document test cases using an open source test management tool.
- Demonstrate understanding of defect management life cycle and ability to use an open source tool for defect management.
- Demonstrate understanding of test data management.
- Demonstrate understanding of automation testing.
- Given a web application for testing, create test script and execute automated tests using an open source automation testing tool.
- Ability to explore and get certified for ISTQB-foundation level certificate.

UNIT- I  Introduction  (9)

Introduction to Testing – why and what, Why is testing necessary? What is testing? Role of Tester, Testing and Quality, Overview of STLC, Software Testing Life Cycle - V model, SDLC vs STLC, different stages in STLC, document templates generated in different phases of STLC, different levels of testing, different types of testing

UNIT -II  Static Testing  (9)

Static Testing, Static techniques, reviews, walkthroughs, Basics of test design techniques, various test categories, test design techniques for different categories of tests. Designing test cases using MS-Excel.
UNIT-III Test Management

Test management, Documenting test plan and test case, effort estimation, configuration management, project progress management. Use of Testopia for test case documentation and test management. Defect management, Test Execution, logging defects, defect lifecycle, fixing / closing defects. Use of Bugzilla for logging and tracing defects.

UNIT- IV Test Data Management

Test Data Management, Test Data Management –Overview, Why Test Data Management, Test Data Types, Need for Test Data Setup, Test Data Setup Stages, Test data management Challenges. Creating sample test data using MS-Excel, Basics of Automation testing, Introduction to automation testing, why automation, what to automate, tools available for automation testing

UNIT- V Basics of Automation Testing Using Selenium

Basics of Automation testing using Selenium, Introduction to Selenium, using Selenium IDE for automation testing, using Selenium Web driver for automation testing, understanding TestNG framework with Selenium Web driver for automation testing

Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES

1. http://docs.seleniumhq.org/docs/
VALUE ADDED COURSES
OBJECTIVE:

Yoga Education Helps To Develop The Self Discipline, Self Control, Awareness, Concentration And Higher Level Of Consciousness.

AIM : To Enable The Student To Have Physical Health And Mental Health.

UNIT- I

Introduction To Yoga- Meaning Of Yoga – Concept Of Yoga- Aim And Objectives Of Yoga –History Of Yoga - Systems Of Yoga.- Stages (Or) Limbs Of Yoga

UNIT- II


UNIT- III


UNIT- IV


UNIT- V


REFERENCES:


Any business has to be developed from scratch. As entrepreneur one should learn various avenues of promoting the given business along with ethics which is other side of the coin. This course is meant to inculcate to develop a business plan connected with ethics.

**Objective:**
To explain relevance of Ethics while taking business decisions.

**Unit I**

**Unit II**
Business Plan Process - Sources of Information – Online Resources - Offline Resources - Sources of Market Research - Benefits of market study - Coverage of market study.

**Unit III**

**Reference books:**

2. Rhonda Abrams “The business plan in a day” Prentice Hall.
3. Business plan preparation - Entrepreneurship Development Institute of India
COURSE OBJECTIVES:

- Assemble/setup and upgrade personal computer systems
- Perform installation, configuration, and upgrading of microcomputer hardware and software.

LEARNING OUTCOME:

- Diagnose and troubleshoot microcomputer systems hardware and software, and other peripheral equipment.

UNIT I  Introduction


UNIT II  Peripheral Devices


UNIT III  PC Hardware Overview


UNIT IV  Installation and Preventive Maintenance


UNIT V  Troubleshooting


TEXT BOOK:

REFERENCES:

COURSE OBJECTIVES:

- Describe those aspects of mobile programming that make it unique from programming for other platforms,
- Critique mobile applications on their design pros and cons,
- Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces,
- Program mobile applications for the Android operating system that use basic and advanced phone features, and Deploy applications to the Android marketplace for distribution.

LEARNING OUTCOMES:

- Ability to install Android in Eclipse
- Understanding of the Android environment to develop projects
- Ability to develop simple Android projects
- Understanding of the android widgets and inclusion of it in projects
- Ability to create android application for playing audio and video files

LIST OF EXPERIMENTS

2. Creating and Running Android Virtual Device (AVD)
3. Running Hello World Android Project
4. Working with different Android User Interface
5. A simple android application to study various android widgets like text box, buttons, toggle Buttons and Images
6. Working with Android Activity life cycle
7. Working with intents
8. Working with fragments
9. Working with TTS engine in Android
10. A simple android application for playing audio and video files

Total Hours: 30
17BECS561 SOFT SKILLS

COURSE OBJECTIVE:

- To elevate the students into productivity powerhouses who can employ life skills to better their performances

UNIT I (4)

Overview to communication, self Introduction, Presentation on their own topic, Extempore, Group Activity

UNIT II (3)

Group Discussion, Do's and Don’ts of Group Discussion, Body language, Grooming and Resume, Resume correction

UNIT III (4)

Introduction to HRM – Questions - Do's and Don’t's - Interview - Mock GD - Stress Management

UNIT IV (4)

Personality Development - Presentation skills, Interpersonal skills, Critical thinking, Confidence building and Stress management.

Total Hours:15

REFERENCES

COURSE OBJECTIVES:

- Describe how networks impact our daily lives.
- Describe the role of data networking in the human network.
- Identify the key components of any data network.
- Describe the characteristics of network architectures: fault tolerance, scalability, quality of service and security.
- Devices that make up the network.

LEARNING OUTCOMES:

- To identify and describe internet architecture, structure, functions, components, and models;
- To describe the use of OSI and TCP layered models;
- To identify and describe the nature and roles of protocols and services at the application, network, data link, and physical layers;
- To describe principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations;
- To build simple LAN topologies by applying basic principles of cabling, device configuration, and IP subnetting

UNIT-1


UNIT-2

UNIT-3


UNIT-4


Total Hours:15

REFERENCES:

COURSE OBJECTIVES:

- To describe the architecture, components, and operation of routers, and explains the principles of routing and routing protocols.
- To students analyze, configure, verify, and troubleshoot the primary routing protocols RIPv1, RIPv2, EIGRP, and OSPF.
- To recognize and correct common routing issues and problems. Model and analyze routing processes.

LEARNING OUTCOMES:

- To describe the purpose, nature, and operations of a router; describe the purpose and nature of routing tables;
- To describe the purpose and procedure of configuring static routes;
- To design and implement a classless IP addressing scheme for a given network;
- To describe the basis features and concepts of link-state routing protocols;
- To configure and verify basic RIPv1, RIPv2, single area OSPF, and EIGRP operations in a small routed network.

UNIT-1 (3)

UNIT-2 (3)

UNIT-3 (3)
UNIT-4

UNIT-5

Total Hours:15

REFERENCES:
COMPUTER SCIENCE AND ENGINEERING

PROFESSIONAL ELECTIVES
COURSE OBJECTIVES:

- To extend the students' knowledge of algorithms and data structures, and to enhance their expertise in algorithmic analysis and algorithm design techniques.
- Expected to learn a variety of useful algorithms and techniques and able to apply those algorithms and techniques to solve problems.

LEARNING OUTCOMES:

- Solve problems using the procedural, functional, and object-oriented programming paradigms.
- Differentiate amongst the classic algorithms and data structures.
- Evaluate contemporary legal, social, and ethical issues in computing professions.

UNIT I  
**Fundamentals**  
(9)


UNIT II  
**Heap Structures**  
(9)


UNIT III  
**Trees**  
(9)


UNIT IV  
**Set & Graph Algorithms**  
(9)

Set ADT- Union & Find data structure and Applications- Graph traversals-DFS, BFS, Bi connected components, Cut vertices, Graph Matching, Network flow Problems

UNIT V  
**Geometric Algorithms**  
(9)


**Total Hours: 45**

TEXT BOOKS:

REFERENCES:


COURSE OBJECTIVES:

- To do an advanced study of the Instruction Set Architecture, Instruction Level Parallelism with hardware and software approaches, Memory and I/O systems and different multiprocessor architectures with an analysis of their performance.
- To study the ISA design, instruction pipelining and performance related issues.
- To do a detailed study of ILP with dynamic approaches.
- To do a detailed study of ILP with software approaches.
- To study the different multiprocessor architectures and related issues.
- To study the Memory and I/O systems and their performance issues.

LEARNING OUTCOMES:

- To design and construct application specific solutions in the field of computer architecture.
- To appreciate that the solution to any problem in computer architecture is likely to be quickly invalidated by time and to strive for solutions that minimize the effects of this reality.
- To develop confidence in specifying computational requirements and formulating original solutions in a timely manner.

UNIT I Pipelining and ILP


UNIT II Advanced Techniques for Exploiting ILP


UNIT III Multiprocessors

UNIT IV   Multi-Core Architectures  

UNIT V   Memory Hierarchy Design  
Introduction - Optimizations of Cache Performance - Memory Technology and Optimizations - Protection: Virtual Memory and Virtual Machines - Design of Memory Hierarchies - Case Studies.

Total Hours: 45

TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVE:

- To understand most important design patterns and apply object-oriented techniques for designing reusable, maintainable and modifiable software.

LEARNING OUTCOME:

- To familiarize the student with techniques for designing reusable combinations of Java classes and organizing their cooperation to produce modular and maintainable Java programs.

UNIT I \ INTRODUCTION

History and Origin of Patterns – Applying Design Patterns – Prototyping – Testing.

UNIT II \ DESIGN PATTERNS

Kinds of Pattern – Quality and Elements – Patterns and Rules – Creativity and Patterns – Creational Patterns – Structural Patterns – Behavioral Patterns, Factory Patterns

UNIT III \ FRAMEWORKS

State and Strategy of Patterns. Singleton, Composite, Functions and the Command Patterns, Adaptor, Proxy Pattern, Decorator Pattern – Pattern Frameworks and Algorithms.

UNIT IV \ CATALOGS

Pattern Catalogs and Writing Patterns, Patterns and Case Study

UNIT V \ ADVANCED PATTERNS

Anti-Patterns - Case Studies In UML and CORBA, Pattern Community

Total Hours: 45

TEXT BOOKS:

1. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides, Design Patterns: Elements of Reusable Object-oriented Software, Pearson Education, 2015

2. James W- Cooper, Java Design Patterns – A Tutorial, Addison-Wesley, 2015

REFERENCES:


COURSE OBJECTIVES:

- Understand and describe current and emerging database models and technologies.
- Design and implement relational database solutions for general applications.
- Develop database scripts for data manipulation and database administration.
- Understand and perform common database administration tasks, such as database monitoring, performance tuning, data transfer, and security.
- Understand the concepts and practices of data warehouse and OLAP.

LEARNING OUTCOMES:

- Able to understand the background and knowledge of some advanced topics in database that have become key techniques in modern database theory and practices; typical topics are distributed concurrency control, database recovery, query optimization, spatial databases.
- Able to understand the background and knowledge of some contemporary topics in database research; typical topics are data mining, uncertainty data management, XML data.
- Able to understand the background and knowledge of some contemporary topics in information management, typical topics are cloud computing, web information management, social network technology.

UNIT I Relational Model Issues (9)


UNIT II Distributed Databases (9)


UNIT III Object Oriented Databases (9)


UNIT IV Emerging Systems (9)

UNIT V Current Issues


Total Hours: 45

TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVES:

To learn the fundamentals of Operating Systems

- To gain knowledge on Distributed operating system concepts that includes architecture,
- Mutual exclusion algorithms, Deadlock detection algorithms and agreement protocols To
gain insight on to the distributed resource management components viz. the

LEARNING OUTCOME:

- Algorithms for implementation of distributed shared memory, recovery and commit
protocols To know the components and management aspects of Real time, Mobile
operating systems

UNIT I       FUNDAMENTALS OF OPERATING SYSTEMS

Overview – Synchronization Mechanisms – Processes and Threads - Process Scheduling – Deadlocks:

UNIT II       DISTRIBUTED OPERATING SYSTEMS

Issues in Distributed Operating System – Architecture – Communication Primitives – Lamport’s Logical
clocks – Causal Ordering of Messages – Distributed Mutual Exclusion Algorithms – Centralized and
Distributed Deadlock Detection Algorithms – Agreement Protocols.

UNIT III      DISTRIBUTED RESOURCE MANAGEMENT

Distributed File Systems – Design Issues - Distributed Shared Memory – Algorithms for Implementing
Distributed Shared memory–Issues in Load Distributing – Scheduling Algorithms – Synchronous and
Asynchronous Check Pointing and Recovery – Fault Tolerance – Two-Phase Commit Protocol –

UNIT IV       REAL TIME AND MOBILE OPERATING SYSTEMS

Basic Model of Real Time Systems - Characteristics- Applications of Real Time Systems – Real Time
Task Scheduling - Handling Resource Sharing - Mobile Operating Systems – Micro Kernel Design -

UNIT V       CASE STUDIES

Linux System: Design Principles - Kernel Modules - Process Management Scheduling – Memory
Management - Input-Output Management - File System - Interprocess Communication. i iOS and
Android: Architecture and SDK Framework - Media Layer - Services Layer - Core OS Layer – File
System.

Total Hours: 45
TEXT BOOK:


REFERENCES:

COURSE OBJECTIVES:

- To cover the fundamental concepts of the C# language and the .NET framework.
- The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the framework.
- The student will gain programming skills in C# both in basic and advanced levels.
- By building sample applications, the student will get experience and be ready for large-scale projects.

LEARNING OUTCOMES:

The main goal of the course is for students to:

- Write clear and effective C# code.
- Access data using ADO.NET
- Develop web applications using ASP.NET Web Forms.
- Develop and use ASP.NET Web Services.

UNIT I Introduction (9)


UNIT II Assemblies (9)


UNIT III Interfaces and Collections (9)


UNIT IVIO Namespace and ADO .NET (9)


Total Hours: 45

TEXT BOOK:


REFERENCE:

COURSE OBJECTIVES:

- Write servlets using the Java programming language (Java servlets)
- Understand and manage HTTP sessions in a web application
- Create servlet filters and listeners
- Write pages created with Java Server Pages technology (JSP pages)
- Create easy-to-maintain JSP pages using the Expression Language and the JSP Standard Tag Library (JSTL)
- Use integrated development environments (IDEs) and application servers for Java EE development and deployment

LEARNING OUTCOMES:

- Construct and deploy small-to-medium scale web applications found in intranet and low-volume commercial sites by using JavaServer Page (JSP page) technology and servlets.
- Apply Model-View-Controller (MVC) architecture to projects in EE environments.
- Create servlet filters and listeners.
- Understand and manage HTTP sessions in a web application.
- Create easy-to-maintain JSP pages using Expression Language and the JSP Standard Tag Library (JSTL).
- Analyze, design, develop and deploy web applications with Java EE 6 SDK and the application server Oracle WebLogic Server

UNIT I SERVLETS (9)
Web Application - Java Servlets - Servlet Lifecycle - Servlet Context - Session management - Building the first Servlet - Deploying the Servlet

UNIT II INTRODUCTION TO JSP (9)
Introduction to Java Server Pages - Features of JSP - Basic HTML Tags - JSP Tag library - JSP Page Life cycle - Developing a Simple Java server Page - JSP Processing Model - Comments and Character Coding - MVC architecture - 3-tier architecture - Advantages of JSP over competing technologies

UNIT III JSP SCRIPTING ELEMENTS AND DIRECTIVES (9)

UNIT IV JSP ACTIONS AND CUSTOM TAGS (9)
JSP Actions - include Action - forward Action - plugin Action - Java Beans - Bean Related – Actions - Custom Tag - Types of Tags - Creating Custom Tags
UNIT V ADVANCE CUSTOM TAGS AND JSTL


Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES:

1. www.jsptut.com/
2. www.tutorialspoint.com/jsp/
3. www.javatpoint.com/jsp-tutorial
COURSE OBJECTIVES:

- To study the concept of menus, windows, interfaces.
- To study about business functions.
- To study the characteristics and components of windows.
- To study the various controls for the windows.
- To study about various problems in windows design with color, text, graphics
- To implement the basics and in-depth knowledge about UID. It enables the students to take up the design the user interface, design, menu creation and windows creation and connection between menu and windows.

LEARNING OUTCOMES:

- To demonstrate knowledge of some theories of design of user interfaces
- To demonstrate knowledge of different interaction styles
- To be able to analyze a user interface from a communication perspective
- To demonstrate an awareness of the relation between interaction design and users expectations

UNIT-I Introduction (9)

Introduction- Importance-Human-Computer interface-characteristics of graphics interface-Direct manipulation graphical system - web user interface-popularity-characteristic & principles.

UNIT-II UI Design Process (9)


UNIT-III UI Controls (9)


UNIT-IV Web Page Designing (9)


UNIT-V UI Tests (9)


Total Hours: 45
TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVES:

- 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
- To understand the IOT protocols

LEARNING OUTCOMES:

- Upon completion of the course, the students will be able to Identify and design the new models for market strategic interaction
  Design business intelligence and information security for WoB
- Analyze various protocols for IoT
- Design a middleware for IoT
- Analyze and design different models for network dynamics

UNIT I INTRODUCTION

UNIT II IOT PROTOCOLS

UNIT III WEB OF THINGS

UNIT IV INTEGRATED

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, Synchronisation and Software Agents. Applications - Smart Grid – Electrical Vehicle Charging

Total Hours: 45
TEXT BOOK:


REFERENCES:

1. Architecting the Internet of Things - Dieter Uckelmann; Mark Harrison; Florian Michahelles-(Eds.) – Springer – 2011
2. Networks, Crowds, and Markets: Reasoning About a Highly Connected World - David Easley and Jon Kleinberg, Cambridge University Press - 2010
3. The Internet of Things: Applications to the Smart Grid and Building Automation by - Olivier Hersent, Omar Elloumi and David Boswarthick - Wiley -2012
COURSE OBJECTIVES:

- To create in-depth awareness of packet routing in computer communication networks
- To provide comprehensive details of routing algorithms, protocols and architectures of routers followed by the concepts of MPLS towards the next generation routing

LEARNING OUTCOMES:

- To be able to explain basic network routing concepts and algorithms
- To be able to explain how the Internet protocol suite operates describe the functions of various protocols
- To be able to explain the concept and usage of node addressing classify addresses into network layers

UNIT I  Introduction

ISO OSI Layer Architecture, TCP/IP Layer Architecture, Functions of Network layer, General Classification of routing, Routing in telephone networks, Dynamic Non hierarchical Routing (DNHR), Trunk status map routing (TSMR), real-time network routing (RTNR), Distance vector routing, Link statersouting, Hierarchical routing.

UNIT II  Internet Routing

Interior protocol: Routing Information Protocol (RIP), Open Shortest Path First(OSPF), Bellman Ford Distance Vector Routing, Exterior Routing Protocols: Exterior Gateway Protocol (EGP) and Border Gateway Protocol (BGP). Multicast Routing: Pros and cons of Multicast and Multiple Unicast Routing, Distance Vector Multicast Routing Protocol (DVMRP), Multicast Open Shortest Path First (MOSPF), MBONE, Core Based Tree Routing.

UNIT III  Routing In Optical Wdm Networks

Classification of RWA algorithms, RWA algorithms, Fairness and Admission Control, Distributed Control Protocols, Permanent Routing and Wavelength Requirements, Wavelength Rerouting-Benefits and Issues, Lightpath Migration, Rerouting Schemes, Algorithms- AG, MWPG.

UNIT IV  Mobile - IP Networks


UNIT V  Mobile Ad –Hoc Networks

Internet-based mobile ad-hoc networking communication strategies, Routing algorithms – Proactive routing: destination sequenced Distance Vector Routing (DSDV), Reactive routing: Dynamic Source Routing (DSR), Ad hoc On-Demand Distance Vector Routing (AODV), Hybrid Routing: Zone Based Routing (ZRP).

Total Hours: 45
TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVES:

- To understand the basic concepts in distributing computing in operating systems
- To enable the students to involve in research activities in recent trends
- To make the students to get idea of distributed operating systems

LEARNING OUTCOMES:

The main goal of the course is for students to:

- Identify the differences among: concurrent, networked, distributed, and mobile.
- Understand Resource allocation and deadlock detection and avoidance techniques.
- Understand Remote procedure calls.
- Understand IPC mechanisms in distributed systems.
- Design and build newer distributed file systems for any OS.

UNIT I   Fundamentals


UNIT II   Remote Procedure Calls


UNIT III   Distributed Shared Memory


UNIT IV   Synchronization and Management


UNIT V   Distributed File Systems


Total Hours: 45
TEXT BOOK:


REFERENCES:

COURSE OBJECTIVES:

- To learn various techniques for mining data streams
- To understand the models used for recognition of objects in videos.
- To learn Event Modelling for different applications.
- To acquire the knowledge of extracting information from surveillance videos.

LEARNING OUTCOMES:

- Work with big data platform and its analysis techniques.
- Design efficient algorithms for mining the data from large volumes.
- Work with surveillance videos for analytics.
- Design of optimization algorithms for better analysis and recognition of objects in a scene.
- Model a framework for Human Activity Recognition

UNIT I INTRODUCTION TO BIG DATA & DATA ANALYSIS (9)

Introduction to Big Data Platform – Challenges of Conventional systems – Web data- Evolution of Analytic scalability- analytic processes and tools- Analysis Vs Reporting- Modern data analytic tools-
Data Analysis: Regression Modeling- Bayesian Modeling- Rule induction.

UNIT II MINING DATA STREAMS (9)

Introduction to Stream concepts- Stream data model and architecture – Stream Computing- Sampling data in a Stream- Filtering Streams- Counting distinct elements in a Stream- Estimating moments-
Counting oneness in a window- Decaying window- Real time Analytics platform(RTAP) applications-case studies.

UNIT III VIDEO ANALYTICS (9)

Introduction- Video Basics - Fundamentals for Video Surveillance- Scene Artifacts - Object Detection and Tracking: Adaptive Background Modelling and Subtraction- Pedestrian Detection and Tracking-
Vehicle Detection and Tracking- Articulated Human Motion Tracking in Low- Dimensional Latent Spaces

UNIT IV BEHAVIOURAL ANALYSIS & ACTIVITY RECOGNITION (9)

Event Modelling- Behavioural Analysis- Human Activity Recognition-Complex Activity Recognition-
Activity modelling using 3D shape, Video summarization, shape based activity models- Suspicious Activity Detection
UNIT V HUMAN FACE RECOGNITION & GAIT ANALYSIS

Introduction: Overview of Recognition algorithms – Human Recognition using Face: Face Recognition from still images, Face Recognition from video, Evaluation of Face Recognition Technologies- Human Recognition using gait: HMM Framework for Gait Recognition, View Invariant Gait Recognition, Role of Shape and Dynamics in Gait Recognition

TEXT BOOK:


REFERENCES:

COURSE OBJECTIVES:

- To understand the concepts of sensor networks
- To learn how to program sensor motes
- To understand the challenging issues in each layer of sensor networks

LEARNING OUTCOMES:

- Apply knowledge of wireless sensor networks to various application areas.
- Ability to Design, implement and maintain wireless sensor networks.
- Ability to formulate and solve problems creatively.

UNIT I  Fundamentals of Sensor Networks (9)

Introduction and Overview - Overview of sensor network protocols, architecture, and applications, Challenges, Main features of WSNs; Research issues and trends, Platforms-Standards and specifications-IEEE802.15.4/Zigbee, Hardware: Telosb, Micaz motes, Software: Overview of Embedded operating systems-Tiny OS, Introduction to Simulation tools- TOSSIM, OPNET, Ns-2.

UNIT II  Communication Characteristics and Deployment Mechanisms (9)

Wireless Communication characteristics - Link quality, fading effects, Shadowing, Localization, Connectivity and Topology - Sensor deployment mechanisms, Coverage issues, Node discovery protocols.

UNIT III  Mac Layer (9)

Fundamentals of Medium access protocol- Medium access layer protocols - Energy efficiency, Power allocation and Medium access control issues.

UNIT IV  Network Layer and Transport Layer (9)


UNIT V  Middleware and Security Issues (9)

Middleware and Application layer -Data dissemination, Data storage, Query processing, Security - Privacy issues, Attacks and Countermeasures

Total Hours :45

TEXT BOOKS:


REFERENCES:


COURSE OBJECTIVES:

To gain understanding of the basic principles of service orientation
- To learn service oriented analysis techniques
- To learn technology underlying the service design
- To learn advanced concepts such as service composition, orchestration and Choreography
- To know about various WS-* specification standards

LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to
- Look up information using man pages.
- Use a debugger and a program profiler; benchmark program execution and identify both critical and dead code.
- Use structures to pass information and document structures using labelled diagrams.
- Set up callback routines such as those used in handling signals.
- Create a C program and a script that interprets command line options.
- Develop test data and test scripts.

UNIT I Introduction


UNIT II Services

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

UNIT III Analysis


UNIT IV SOA

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

WS-BPEL basics – WS-Coordination overview - WS-Choreography, WS-Policy, WS- Security

Total Hours: 45

TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVES:

- To understand software metrics and measurement.
- To explain quality assurance and various tools used in quality management.
- To learn in detail about various quality assurance models.
- To understand the audit and assessment procedures to achieve quality.

LEARNING OUTCOMES:

- Identify the fundamental issues that a project manager has to consider, and describe, chiefly in the context of software development projects, what approaches exist to manage these issues.
- Identify and analyze software project activities using contemporary work breakdown techniques.
- Identify and apply selected techniques for estimating the effort and duration of project activities.
- Construct a schedule of project activities using contemporary planning techniques.
- Construct a quality model for a software development project, including identification of suitable quality attributes, suitable metrics for measuring these, and suitable threshold values for these metrics to indicate acceptable quality.

UNIT I Software Process and People Management

Process Maturity – Capability Maturity Model (CMM) – Variations in CMM - Productivity improvement process. Organization structure – Difficulties in people management - Effective team building – Role of Project manager - Team structures – Comparison of different team structures.

UNIT II Software Metrics

Role of metrics in software development - Project metrics – Process metrics – Data gathering - Analysis of Data for measuring correctness, integrity, reliability and maintainability of Software products.

UNIT III Project Management


UNIT IV Risk Management

Risk analysis and management - Types of Risk involved - RMM plan.

**TEXT BOOK:**


**REFERENCES:**

COURSE OBJECTIVES:

- To understand the internals of the TCP/IP protocols
- To understand how TCP/IP is actually implemented
- To understand the interaction among the protocols in a protocol

LEARNING OUTCOME:

- Having learned about computer networks, this subject helps the students to learn TCP/IP protocol in depth considering design alternatives and implementation techniques.

UNIT- I  INTRODUCTION  (9)

UNIT- II  TCP  (9)
Services – header – connection establishment and termination- interactive data flow- bulk data flow-timeout and retransmission – persist timer - keepalive timer- futures and performance

UNIT- III  IP IMPLEMENTATION  (9)
IP global software organization – routing table- routing algorithms-fragmentation and reassembly-error processing (ICMP) –Multicast Processing (IGMP)

UNIT- IV  TCP IMPLEMENTATION I  (9)
Data structure and input processing – transmission control blocks- segment format- comparison-finite state machine implementation-Output processing- mutual exclusion-computing the TCP data length

UNIT- V  TCP IMPLEMENTATION II  (9)
Timers-events and messages- timer process- deleting and inserting timer event- flow control and adaptive retransmission-congestion avoidance and control – urgent data processing and push function.

Total Hours:45
TEXT BOOK:


REFERENCES:

1. Forouzan, TCP/IP protocol suite (2nd Edition), TMH, 2005
COURSE OBJECTIVES:

- To explore the fundamental concepts of big data analytics
- To learn to analyze the big data using intelligent techniques.
- To understand the various search methods and visualization techniques.
- To learn to use various techniques for mining data stream.
- To understand the applications using Map Reduce Concepts.

LEARNING OUTCOMES:

- Understanding of Big Data and Hadoop ecosystem
- Understanding fundamentals of Hadoop ecosystem and NoSQL technologies
- Working with Hadoop Distributed File System (HDFS)
- Ability to write MapReduce programs and implementing HBase
- Ability to write Hive and Pig scripts

UNIT I      Introduction to Big Data

Introduction to BigData Platform –Challenges of Conventional Systems -Intelligent data analysis –

UNIT II     Mining Data Streams

Introduction To Streams Concepts –Stream Data Model and Architecture -Stream Computing -

UNIT III    Hadoop

History of Hadoop-The Hadoop Distributed File System –Components of Hadoop-Analyzing the Data with Hadoop-Scaling Out-Hadoop Streaming-Design of HDFS-Java interfaces to HDFSBasics-Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort –Task execution -Map Reduce Types andFormats-Map Reduce Features

UNIT IV     Hadoop Environment

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive – fundamentals of HBase and ZooKeeper – IBM InfoSphere BigInsights and Streams. Visualizations – Visual data analysis techniques, interaction techniques; Systems and applications.

Total Hours: 45

TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVES:
- This unit gives an introduction to Ad-Hoc Wireless Networks, Issues, and Classification of MAC Protocols.
- This unit gives a detailed description of Different types of AdHoc Routing Protocols and TCP over AdHoc Protocol.
- This unit provides in-depth knowledge about Sensor Network Architecture, its Applications and MAC Protocols for sensor networks.
- This unit begins with a discussion of Different Issues in Wireless Sensor Routing. It also covers Indoor and outdoor Localization and Quality of Service in WSN.
- This unit emphasize on Necessity for Mesh Networks, IEEE 802.11s Architecture and different types of Mesh Networks

LEARNING OUTCOMES:
- Identify the basic problems, limitations, strengths and current trends of mobile computing
- Explain the current wireless networking mechanisms for mobile computing
- Analyse and critique the performance of different networks and algorithms for mobile Computing
- Develop an attitude to propose solutions with comparisons for problems related to mobile computing through investigation of different protocols and mobile/wireless networks

UNIT I  Ad-Hoc MAC

UNIT II  Ad-Hoc Network Routing & TCP

UNIT III  WSN –MAC

UNIT IV  WSN Routing, Localization & QOS

UNIT V  Mesh Networks

Total Hours: 45
TEXT BOOK:


REFERENCES:

COURSE OBJECTIVES:
- To analyze the components of cloud computing and its business perspective.
- To collaborate with real time cloud services.
- To analyze the case studies to derive the best practice model to apply when developing and deploying cloud based applications.

LEARNING OUTCOMES:
- Understand and appreciate the technological impact of service and cloud computing for future enterprises, and the technologies underpinning it.
- Apply systematic and principled practices to designing, implementing and deploying service and cloud-oriented computing.
- Review and assess the risks, opportunities, costs and steps towards migrating existing systems to service and cloud computing.

UNIT- I Cloud Introduction


UNIT-II Cloud Services and File System

Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service – Communication as services. Service providers - Google App Engine, Amazon EC2, Microsoft Azure, Sales force. Introduction to MapReduce, GFS, HDFS, Hadoop Framework.

UNIT-III Collaborating with Cloud


UNIT-IV Virtualization for Cloud

Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization – System Vm, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - Hypervisors – Xen, KVM , VMWare, Virtual Box, Hyper-V.
UNIT-V Security, Standards, and Applications


Total Hours: 45

TEXT BOOK:


REFERENCES:

COURSE OBJECTIVES:

- To understand the basics of Information Security
- To know the legal, ethical and professional issues in Information Security
- To know the aspects of risk management
- To study the critical need for ensuring Information Security in Organizations

LEARNING OUTCOMES:

- Learn to select appropriate techniques to tackle and solve problems in the discipline of information security management;
- Learn the importance of security and its management for any modern organization
- Learn how an information security management system should be planned, documented, implemented and improved, according to the BSI standard on information security management.

UNIT I Introduction (9)


UNIT II Security Investigation (9)

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III Security Analysis (9)

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV Logical Design (9)


UNIT V Physical Design (9)


Total Hours: 45
TEXT BOOK:


REFERENCES:

COURSE OBJECTIVE

- Simplilearn’s DevOps practitioner course is designed to allow you to apply the latest in devops methodology to automate your software development lifecycle right out of the class.
- You will master Configuration Management, Continuous Integration and Continuous Deployment, Continuous Delivery, Continuous Monitoring using DevOps tools-Git, Docker, Jenkins, Puppet and Nagios in practical, hands on and interactive approach.
- The course is centered around makes use of Docker containers.
- This technology is revolutionizing the way apps are deployed on the cloud today and is a critical skillset to master in the cloud age.

INTENDED OUTCOME

- An understanding of devops and the modern devops toolset
- The ability to automate all the aspects of a modern code delivery and deployment pipeline using:
  - Source code management tools
  - Build tools
  - Test automation tools
  - Containerization through Docker
  - Configuration management tools
  - Monitoring tools

Unit-1: Introduction to Devops

What is DevOps? What are its components? Agile and DevOps: How do they inter-relate?-An understanding of DevOps-An understanding of the technical challenges in DevOps- An understanding of security issues-An understanding of the difference between requirements and architecture-How to write user acceptance tests-Hands on Projects/Tools covered: 1. Setup of the cloud environment. Demo is done with Google cloud, but devOps is agnostic of cloud type (AWS, Azure and GCP will all function the same way) 2. Tools: GCP/AWS/Azure

Unit-2: Managing source code and automating builds

How to manage change by setting up and using a source control system-How to automate the process of assembling software components with build tools-How to automate the building of the whole system with continuous integration tools-The major differences between popular tools: CVS, SVN, and Git-How to use Eclipse editor, Advantages of the Eclipse editor-Hands on Projects/Tools covered: 1. Concepts: Ticketing, Subversion, Using GIT, Java Profiling 2. Jenkins and Git 3. Tools Covered: SCCS and CVS, Subversion, Git, Maven, Make, JaCoCo, Ant, jUnit for Unit test, SonarQube, Sqale, Structure 101 4. Hands on: Setup of Java sample program, Maven, path setup, Run Maven goals, Eclipse,
Unit- 3: Automated testing and Test driven development


Unit-4: Containerization using Docker


Unit-5: Continuous integration

Continuous integration with Team city-Integration of Eclipse with Teamcity-Continuous integration with Jenkins

REFERENCE BOOKS:

COURSE OBJECTIVE:

- Develop resource description framework data
- Work with SPARQL queries
- Familiar with the applications of semantic web technology

LEARNING OUTCOMES:

- Show an understanding of the basic principles of different theoretical models of distributed knowledge-based systems, and assess their applicability to specific knowledge-sharing tasks.
- Describe the motivations for, and effectiveness of, inference techniques in the implementation of distributed knowledge-based systems.
- Critically assess the adequacy of relevant standards (WSDL, RDF, OWL, etc) as a basis for building practical systems.
- Demonstrate an understanding of how the architecture and design of distributed knowledge-based systems interacts with wider social and technological developments.

UNIT I Introduction


UNIT II Rdf and Querying the Semantic Web

RDF data model-syntaxes-Adding semantics - RDF schema-RDF and RDF schema in RDF schema-An axiomatic semantics for RDF and RDF schema-Querying the semantic web-SPARQL-Basics-Filters-Constructs-Organizing result sets-Querying schemas.

UNIT III Ontology


UNIT IV Logic and Inference


UNIT V Applications of Semantic Web Technologies

Good relations-BBC artists-BBC world cup 2010 website-Government data, Newyork times-Sigma and sindiceopen Calais-schema.org-Future of semantic web

Total Hours - 45
TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVE:
- To understand the practices and technology to start an online business

LEARNING OUTCOME:
- To know how to build and manage an e-business

UNIT I INTRODUCTION (9)
Traditional commerce and E commerce – Internet and WWW – role of WWW – value chains – strategic business and Industry value chains – role of E commerce.

UNIT II INFRASTRUCTURE FOR E COMMERCE (9)

UNIT III WEB BASED TOOLS FOR E COMMERCE (9)

UNIT IV SECURITY (9)

UNIT V INTELLIGENT AGENTS (9)

Total Hours - 45

TEXT BOOKS:
1. Ravi Kalakota, “Electronic Commerce”, Pearson Education,

REFERENCES:
COURSE OBJECTIVES:

- The students will be able to interpret the contributions of human factors and technical constraints on human–computer interaction. Evaluate the role of current HCI theories in the design of software.
- Apply HCI techniques and methods to the design of software.
- Categorize and carefully differentiate various aspects of multimedia interfaces.
- Design and develop issues related to HCI for real application.

LEARNING OUTCOMES:

- Understand key aspects of human psychology which can determine user actions at and satisfaction of the interface.
- Describe the key design principles for user interfaces.
- Set up and carry out a process to gather requirements for, engage in iterative design of, and evaluate the usability of a user interface.
- Describe how user interface development can be integrated into an overall software development process.
- Understanding of the ethical issues involved in testing user interfaces.

UNIT I Design Process


UNIT II Design and Evaluation of Interactive Systems


UNIT III Models


UNIT IV Experimental Design and Statistical Analysis of HCI


UNIT V Theories


Total Hours: 45

TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVES:

- To provide the student with knowledge of various levels of analysis involved in NLP.
- To understand language modeling.
- To gain knowledge in automated natural language generation and machine translation.

LEARNING OUTCOMES:

- Compose key NLP elements to develop higher level processing chains
- Assess / Evaluate NLP based systems
- Choose appropriate solutions for solving typical NLP sub problems (tokenizing, tagging, parsing)
- Describe the typical problems and processing layers in NLP

UNIT I  Overview and Language Modeling


UNIT II  Word Level and Syntactic Analysis


UNIT III  Semantic Analysis and Discourse Processing


UNIT IV  Natural Language Generation and Machine Translation


UNIT V  Information Retrieval and Lexical Resources


Total Hours: 45
TEXT BOOKS:


REFERENCES:

Course Objectives

- Get strategic understanding of Digital Marketing
- Understand how to use it for branding and sales
- Understand its advantages & limitations
- Become familiar with Best Practices, Tools & Technologies
- Blend digital with offline marketing
- Plan & manage digital marketing budget
- Manage Reporting & Tracking Metrics
- Understand the future of Digital Marketing and prepare for it

INTENDED OUTCOME

- Define and outline key concept related to digital marketing including e-business models, e-consumer behaviour, online marketing communications, website design and social media marketing.
- Critically assess the role that digital marketing can play in business strategy
- Develop tactical decisions concerning effective product, pricing, distribution and promotion decisions in digital marketing
- Reflect on the practical implementation of a digital marketing strategy from a critical and evaluative perspective

Unit-1: Introduction to Digital Marketing

Unit-2: Search Engine Optimisation
Stakeholders in Search-Customer Insights-On & off-page Optimisation-Meta Tags, Layout, Content Pdates-Inbound Links & Link Building

Unit-3: Search Marketing and Web Site Analytics
Campaign Management-Conversion Tracking & Analytics-Keyword Selection-Conversion Metrics: CPA, CTR, Goal Configuration &Funnels-Intelligence Reporting-Conversions, Bounce Rate, Traffic Sources, Scheduling etc

Unit-4: Social Media
What is Social Media Marketing?-Overview of Facebook, Twitter,LinkedIn, Blogging, Youtube and Flickr Building Brand Awareness Using Social Media, Social Media Management-Insights and Analytics-Best Practice Examples & case Studies
Unit-5: Email Marketing, Display advertising, Mobile Marketing, Strategy & Planning

Reference Books:
4. Philip Kotler , Marketing 4.0: Moving from Traditional to Digital Hardcover, 2017.
OPEN ELECTIVES OFFERED BY
COMPUTER SCIENCE AND ENGINEERING
COURSE OBJECTIVES:

- To introduce the Java programming language and explore its current strengths and weaknesses.
- To study the way that object-oriented concepts are implemented in the Java programming language.
- To write working Java code to demonstrate the use of applets for client-side programming.

LEARNING OUTCOMES:

- The way that exceptions are detected and handled in the Java programming language.
- Working of Java code that demonstrates multiple threads of execution.

UNIT I        Introduction (9)

UNIT II       HTML (9)

UNIT III      PERL (9)

UNIT IV      Client-Server programming (9)
UNIT V Internet Telephony


Total Hours: 45

TEXT BOOKS:

REFERENCES:
COURSE OBJECTIVES:

- To study the graphics techniques and algorithms.
- To study the multimedia concepts and various I/O technologies.

LEARNING OUTCOMES:

- To enable the students to develop their creativity
- To impart the fundamental concepts of Computer Animation and Multimedia.

UNIT I  
Introduction  
(9)


UNIT II  
Creating Animation in Flash  
(9)


UNIT III  
3D Animation & its Concepts  
(9)


UNIT IV  
Motion Caption  
(9)


UNIT V  
Concept Development  
(9)

Story Developing – Audio & Video – Color Model – Device Independent Color Model – Gamma and Gamma Correction - Production Budgets- 3D Animated Movies.

Total Hours: 45

TEXT BOOK:

REFERENCES:
1. Principles of Multimedia – Ranjan Parekh, 2007, TMH. (Unit I, Unit V)
COURSE OBJECTIVES:
- Assemble/setup and upgrade personal computer systems
- Perform installation, configuration, and upgrading of microcomputer hardware and software.
- Install/connect associated peripherals.

LEARNING OUTCOME:
- Diagnose and troubleshoot microcomputer systems hardware and software, and other Peripheral equipment.

UNIT I Introduction


UNIT II Peripheral Devices


UNIT III PC Hardware Overview


UNIT IV Installation and Preventive Maintenance


UNIT V Troubleshooting


Total Hours: 45
TEXT BOOK:


REFERENCES:

COURSE OBJECTIVES:

• Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
• Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.

INTENDED OUTCOMES:

• Be aware of the important topics and principles of software development.
• Have the ability to write a computer program to solve specified problems.
• Be able to use the Java SDK environment to create, debug and run simple Java programs

UNIT I  INTRODUCTION TO JAVA  (9)

UNIT II  PACKAGES  (9)

UNIT III  I/O STREAMS  (9)

UNIT IV  EXCEPTION HANDLING  (9)

UNIT V  MOTIVATION FOR GENERIC PROGRAMMING  (9)
TEXT BOOK:


REFERENCES:


WEBSITES:

OPEN ELECTIVES OFFERED BY SCIENCE AND HUMANITIES
COURSE OBJECTIVES:

- To gain knowledge in measures of central tendency.
- To provide necessary basic concepts in probability and random processes.

LEARNING OUTCOMES:

- Learners acquire skills in handling situations involving more than one random variable and functions of random variables.
- The students will have an exposure of various distribution functions, correlation and spectral densities.

UNIT- I MEASURES OF CENTRAL TENDENCY AND PROBABILITY (9)

Measures of central tendency – Mean, Median, Mode - Standard Deviation Probability - Random variable - Axioms of probability - Conditional probability - Total probability – Baye’s theorem.

UNIT- II STANDARD DISTRIBUTIONS (9)

Functions of a random variable - Binomial, Poisson, Uniform, Exponential, Gamma(one Parameter only) and Normal distributions - Moment generating functions, Characteristic function and their properties – Chebyshev’s inequality.

UNIT -III TWO DIMENSIONAL RANDOM VARIABLES (9)

Joint distributions - Marginal and conditional distributions - Probability mass function - Probability density functions – Covariance - Correlation and regression

UNIT- IV CLASSIFICATION OF RANDOM PROCESS (9)

Definition and examples - first order, second order, strictly stationary, wide – sense stationary and Ergodic processes - Markov process - Binomial, Poisson and Normal processes - Sine wave process.

UNIT -V CORRELATION AND SPECTRAL DENSITIES (9)


Total Hours: 45
TEXT BOOK:


REFERENCES:

1. Ross, S A first Course in Probability Pearson Education, New Delhi (Chap 2 to 8) 2012

WEBSITES:

1. www.cut-theknot.org/probability.shtml
2. www.mathcentre.ac.uk
3. www.mathworld. Wolfram.com
COURSE OBJECTIVES:

- To know the fundamentals of fuzzy Algebra.
- To know the basic definitions of fuzzy theory
- To know the applications of fuzzy Technology.

LEARNING OUTCOME:

- The Engineers will have an exposure on various topics such as fuzzy algebra, fuzzy theory and fuzzy technology.

UNIT I   FUZZY SETS  (9)

UNIT II   OPERATIONS ON FUZZY SETS  (9)
Operations on Fuzzy Sets Operations on [0,1] – Fuzzy negation, triangular norms, tconorms, fuzzy implications, Aggregation Operations, Fuzzy Functional Equations

UNIT III   FUZZY RELATIONS  (9)
Fuzzy Relations Fuzzy Binary and n-ary relations – composition of fuzzy relations – Fuzzy Equivalence Relations – Fuzzy Compatibility Relations – Fuzzy Relational Equations

UNIT IV   FUZZY MEASURES  (9)

UNIT V   FUZZY INFERENCE  (9)
Approximate Reasoning Fuzzy Decision Making - Fuzzy Relational Inference – Compositional rule of Inference - Efficiency of Inference - Hierarchical

Total Hours: 45
TEXT BOOK:


REFERENCES:


WEBSITES:

1. www.mathcentre.ac.uk
2. www.mathworld. Wolfram.com
3. www.calvin.edu/~pribeiro/othrlnks/Fuzzy/fuzzysets.htm
COURSE OBJECTIVES:

- To know the fundamentals of linear Algebra.
- To study about the linear transformations
- To introduce the concepts of inner product spaces

LEARNING OUTCOMES:

The student will be able to

- Recognize the underlying theory of vector spaces over a field and inner product spaces over real or complex numbers
- Visualize linear transformations as matrix form
- Articulate the importance of Linear Algebra and its applications in branches of Mathematics

UNIT I VECTOR SPACES
General vector spaces, real vector spaces, Euclidean n-space, subspaces, linear independence, basis and dimension, row space, column space and null space,

UNIT II EIGEN VALUES AND EIGEN VECTORS
Eigen values and Eigen vectors - Diagonalization - Power method - QR decomposition

UNIT III SYSTEM OF LINEAR EQUATIONS

UNIT IV LINEAR TRANSFORMATIONS
Linear Transformations - The Null Space and Range - Isomorphisms - Matrix Representation of Linear Transformations – Similarity - Eigenvalues and Eigenvectors Eigen values and Eigen vectors - Diagonalization

UNIT V INNER PRODUCT SPACES
The Dot Product on R^n and Inner Product Spaces - Orthonormal Bases - Orthogonal Complements - Application : Least Squares Approximation - Diagonalization of Symmetric M - Application: Quadratic Forms

Total Hours: 45
TEXT BOOKS:

REFERENCES:

WEBSITES:
1. www.sosmath.com
2. www.nptel.ac.in
3. www.mathworld.wolfram.com
COURSE OBJECTIVES:

- To provide mathematical basis for acoustics waves and the characteristic behaviour of sound in pipes, resonators and filters.
- To introduce the properties of hearing and speech

LEARNING OUTCOME:

- The students will have the knowledge on acoustics waves, the characteristic behaviour of sound in pipes, resonators and filters and that knowledge will be used by them in different engineering and technology applications

UNIT I INTRODUCTION


UNIT II RADIATION AND RECEPTION OF ACOUSTIC WAVES

Radiation from a pulsating sphere – Acoustic reciprocity – continuous line source radiation impedance - Fundamental properties of transducers. Absorption and attenuation of sound. Absorption from viscosity – complex sound speed and absorption – classical absorption coefficient

UNIT III PIPES RESONATORS AND FILTERS

UNIT IV  ARCHITECTURAL ACOUSTICS  


UNIT V  TRANSDUCTION  

Transducer as an electives network – canonical equation for the two simple transducers transmitters – moving coil loud speaker– horn loud speaker, receivers – condenser – microphone – moving coil electrodynamics microphone piezoelectric microphone – calibration of receivers

Text Book:


Reference:


Websites:

1. www.acousticalsociety.org
2. www.acoustics-engineering.com
3. www.nptel.ac.in
4. www.ocw.mit.edu

Total Hours: 45
COURSE OBJECTIVES:

- To understand about the solid waste
- To study about the waste treatment
- To gain knowledge on the disposal of waste and waste management.
- To get the information on energy conservation.

LEARNING OUTCOME:

- The students will know solid waste and energy conservation. They will understand the methodologies to disposal of solid waste and its management.

UNIT I SOLID WASTE (9)

UNIT II WASTE TREATMENT (9)
Size Reduction – Aerobic Composting – Incineration – batch type and continuous flow type, Medical/Pharmaceutical Waste Incineration – Environmental Impacts – Measures of Mitigate Environmental Effects due to Incineration

UNIT III WASTE DISPOSAL (9)

UNIT IV HAZARDOUS WASTE MANAGEMENT (9)
UNIT V  ENERGY GENERATION FROM WASTE  


Total Hours: 45

TEXT BOOK:


REFERENCES:


WEBSITES:

2. http://www.unep.or.jp/ietc/ESTdir/Pub/MSW/
4. nzic.org.nz/ChemProcesses/environment/
COURSE OBJECTIVES:
- To understand about the green chemistry
- To study the atom efficient process and synthesis elaborately.
- To gain knowledge on the green technology and renewable energy resources.
- To get the information on catalysis

LEARNING OUTCOME:
- Students will know the chemistry and application of green technology for energy sources. They will understand the role of green catalyst in industries.

UNIT I INTRODUCTION TO GREEN CHEMICAL PRINCIPLES (9)
Definition, tools, and twelve principles of green chemistry, solvent-less reactions and reactions in water, microwaves and fluorous solvents, green resolution of racemic mixtures, materials for a sustainable economy, chemistry of longer wear, agrochemicals: problems and green alternate solutions.

UNIT II ATOM EFFICIENT PROCESSES (9)
Atom efficient processes, evaluating chemical reagents according to their yield and atom efficiency, examples of efficient stoichiometric and catalytic processes, atom economy and homogeneous catalysis, halide-free synthesis and alternatives to Strecker synthesis.

UNIT III BIOTECHNOLOGY AND GREEN CHEMISTRY (9)
Bio technology and its applications in environmental protection-Bio informatics-Bio remediation, biological purification of contaminated air. Green chemistry for clean technology-Significance of green chemistry-Basic components of green chemistry, Industrial applications of green chemistry, green fuels-e-green propellants and bio catalysts.

UNIT IV RENEWABLE RESOURCES (9)
Use of renewable materials, evaluating feedstock and starting materials and their origins, toxicity, sustainability and the downstream implications of the choice of feedstock, commodity chemicals from glucose and biomass conversion.
UNIT V CATALYSIS IN GREEN CHEMISTRY

Catalysis, energy requirements and usage, optimization of the reaction by minimizing the energy requirements, examples of efficient catalytic reactions including the use of heterogeneous catalysis, zeolites, oxidation using molecular oxygen.

Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES:

COURSE OBJECTIVES:
- To get the information on electrochemical material.
- To study about the conducting polymers
- To understand about the fuel
- To gain knowledge on the batteries and power sources.

LEARNING OUTCOME:
- Students will understand about the fuel. They will get knowledge on the batteries and power sources.

UNIT I METAL FINISHING (9)

UNIT II CONDUCTING POLYMERS AND ELECTROCHEMICALS (9)
lectropolymerisation- anodic and cathodic polymerization-effect of reaction parameters on the course of the reaction- Electrochemical preparation of conducting polymers- poly acetylene- Electrolytic production of perchlorates and manganese dioxide- Electro organic chemicals- constant current electrolysis.

UNIT III BATTERIES AND POWER SOURCES-I (9)
Principles of energy conservation- electrochemical energy conservation- thermodynamic reversibility, Gibbs equation. EMF- battery terminology, energy and power density- Properties of anodes, cathodes, electrolytes and separators- Types of electrolytes.

UNIT IV BATTERIES AND POWER SOURCES-II (9)
Primary batteries- Dry Leclanche cells, alkaline primary batteries, Lithium batteries, Lithium ion batteries- construction, characteristics, problems associated with system- Secondary batteries- Lead acid, nickel cadmium- Fuel cells- Introduction, types of fuel cells, advantages.
UNIT V   ELECTROCHEMICAL MATERIAL SCIENCE

Solar cells- Preparation of CdS/Cu$_2$S solar cells by screen printing techniques and their characteristics
- Amorphous silicon solar cells - Photo electrochemical cells(PEC) for conversion of light energy to electrical energy - PEC cells based on Cd/Se and Ga/As characteristics.

Total Hours: 45

TEXT BOOKS:


REFERENCES:


WEBSITES:

2. http://hyperphysics.phy-astr.gsu.edu/hbase/electric/battery.html
COURSE OBJECTIVES:
- To understand about the fuel
- To study about the abrasives and lubricants.
- To gain knowledge on inorganic chemicals and explosive materials.
- To get the information on agriculture chemicals.

LEARNING OUTCOME:
- The student will acquire basic knowledge on cement. The student will understand the interaction of engineering materials and their utilization in industries.

UNIT I  CEMENT AND LIME  (9)

UNIT II  ABRASIVES AND REFRACTORIES  (9)

UNIT III  INORGANIC CHEMICALS  (9)

UNIT IV  EXPLOSIVES  (9)
UNIT V AGRICULTURE CHEMICALS


Text Books:

References:

Websites:
OPEN ELECTIVES OFFERED BY ELECTRICAL AND ELECTRONICS ENGINEERING
17BEEEOE01  ELECTRIC HYBRID VEHICLE  

COURSE OBJECTIVES:  
• To understand the basic concepts of electric hybrid vehicle.  
• To gain the knowledge about electric propulsion unit.  
• To understand and gain the knowledge about various energy storage devices.

LEARNING OUTCOME:  
• At the end of the course the student will be understand the concept of electric hybrid vehicle and its energy storage schemes.

UNIT I INTRODUCTION  
History of hybrid and electric vehicles, social and environmental importance of hybrid and electric vehicles, impact of modern drive-trains on energy supplies.

UNIT II HYBRID ELECTRIC DRIVE-TRAiNS  
Basic concept of hybrid traction, introduction to various hybrid drive-train topologies, power flow control in hybrid drive-train topologies, fuel efficiency analysis.

UNIT III ELECTRIC PROPULSION UNIT  
Introduction to electric components used in hybrid and electric vehicles, Configuration and control of DC Motor drives, Configuration and control of Induction Motor drives, configuration and control of Permanent Magnet Motor drives, Configuration and control of Switch Reluctance Motor drives, drive system efficiency.

UNIT IV ENERGY STORAGE  
Introduction to Energy Storage Requirements in Hybrid and Electric Vehicles, Battery based energy storage and its analysis, Fuel Cell based energy storage and its analysis, Super Capacitor based energy storage and its analysis, Flywheel based energy storage and its analysis, Hybridization of different energy storage devices.

UNIT V ENERGY MANAGEMENT STRATEGIES  
Introduction to energy management strategies used in hybrid and electric vehicles, classification of different energy management strategies, comparison of different energy management strategies, implementation issues of energy management strategies.

Total Hours: 45

TEXT BOOK:  

REFERENCES:  
COURSE OBJECTIVES:
- To gain the knowledge about energy management.
- To understand the basic concepts in economic analysis in energy management.
- To understand the basic principles of energy audit.

LEARNING OUTCOME:
- At the end of the course the student will be able to understand the concept of energy efficient motors, economic crisis and energy management.

UNIT I ENERGY MANAGEMENT (9)
Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting – Energy Auditor and Energy Manager – Eligibility, Qualification and functions - Questionnaire and check list for top management.

UNIT II ECONOMIC ASPECTS AND ANALYSIS (9)
Economics analysis – Depreciation Methods, time value of money, rate of return, present worth method, replacement analysis, life cycle costing analysis - Calculation of simple payback method, net present worth method.

UNIT III BASIC PRINCIPLES OF ENERGY AUDIT (9)
Energy audit – definition, concept, type of audit, energy index, cost index, pie charts, Sankey diagrams, load profiles, Energy conservation schemes – Energy audit of industries – energy saving potential, energy audit of process industry, thermal power station, building energy audit.

UNIT IV ENERGY EFFICIENT MOTORS (9)
Electric Motors: Factors affecting efficiency - Energy efficient motors - constructional details, characteristics - voltage variation –over motoring – motor energy audit-

UNIT V POWER FACTOR IMPROVEMENT, LIGHTING AND ENERGY INSTRUMENT (9)

Total Hours: 45

TEXT BOOK:

REFERENCES:
COURSE OBJECTIVES:

- To understand the basic principles of PLC systems.
- To gain the knowledge about data handling functions.
- To understand the principles of PID.

LEARNING OUTCOME:

- At the end of the course the student will be able to understand the registers and functions in PLC and they are able to do the program.

UNIT I INTRODUCTION

PLC Basics PLC system, I/O modules and interfacing CPU processor programming equipment Programming formats, construction of PLC ladder diagrams, devices connected to I/O modules.

UNIT II PLC PROGRAMMING

PLC Programming input instructions, outputs, operational procedures, programming examples using contacts and coils. Drill-press operation. Digital logic gates programming in the Boolean algebra system, conversion examples Ladder diagrams for process control Ladder diagrams and sequence listings, ladder diagram construction and flow chart for spray process system.

UNIT III REGISTERS AND PLC FUNCTIONS

PLC Registers: Characteristics of Registers module addressing holding registers input registers, output registers. PLC Functions Timer functions and industrial applications counters counter function industrial applications, Architecture functions, Number comparison functions, number conversion functions.

UNIT IV DATA HANDLING FUNCTIONS

Data handling functions: SKIP, Master control Relay Jump Move FIFO, FAL, ONS, CLR and Sweep functions and their applications. Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two axes and three axis Robots with PLC, Matrix functions.

UNIT V PID PRINCIPLES

Analog PLC operation: Analog modules and systems Analog signal processing multi bit data processing, analog output application examples, PID principles position indicator with PID control, PID modules, PID tuning, PID functions

Total Hours: 45

TEXT BOOKS:

REFERENCES:

WEBSITE:
1. http://www.mikroe.com/old/books/plcbook/chapter1/chapter1.htm – Introduction to programmable Logic controller
COURSE OBJECTIVES:

- To gain the knowledge about environmental aspects of energy utilization.
- To understand the basic principles of wind energy conversion, solar cells, photovoltaic conversion.
- To understand the basic principles fuel cell, Geo thermal power plants.
- To gain the knowledge about hydro energy.

LEARNING OUTCOME:

- At the end of the course student understands about all types of energy sources and utilization.

UNIT I  INTRODUCTION  (9)

UNIT II  SOLAR ENERGY  (9)

UNIT III  WIND ENERGY  (9)

UNIT IV  HYDRO ENERGY  (9)
Hydropower, classification of hydro power, Turbine selection, Ocean energy resources, ocean energy routes. Principles of ocean thermal energy conversion systems, ocean thermal power plants. Principles of ocean wave energy conversion and tidal energy conversion.

UNIT V  OTHER SOURCES  (9)
Bio energy and types –Fuel cell, Geo-thermal power plants; Magneto-hydro-dynamic (MHD) energy conversion.

Total Hours: 45
TEXT BOOKS:
2. Rai.G.D Non-conventional sources of energy Khanna publishers 201

REFERENCES:

WEBSITES:
1. www.energycentral.com
2. www.catelectricpowerinfo.com
OPEN ELECTIVES OFFERED BY ELECTRONICS AND COMMUNICATION ENGINEERING
COURSE OBJECTIVES:

- To introduce students to the embedded systems, its hardware and software.
- To introduce devices and buses used for embedded networking.
- To study about task management
- To learn about semaphore management and message passing
- To study about memory management

LEARNING OUTCOMES:

- Ability to understand embedded systems, its hardware and software.
- Gain knowledge about devices and buses used for embedded networking.
- Gain knowledge about task management
- Gain knowledge about semaphore management and message passing
- Gain knowledge about memory management

UNIT - I  INTRODUCTION TO EMBEDDED SYSTEM
Introduction - Embedded systems description, definition, design considerations & requirements - Overview of Embedded system Architecture (CISC and RISC) - Categories of Embedded Systems - embedded processor selection & tradeoffs - Embedded design life cycle - Product specifications - hardware/software partitioning - iterations and implementation - hardware software integration - product testing techniques – ARM 7

UNIT - II  OPERATING SYSTEM OVERVIEW

UNIT - III  TASK MANAGEMENT

UNIT - IV  SEMAPHORE MANAGEMENT AND MESSAGE PASSING
UNIT - V  MEMORY MANAGEMENT
Memory Management: Memory Control Blocks – Creating Partition- Obtaining a Memory Block – Returning a Memory Block. Getting Started with µ C/OS-II – Installing µ C/OS-II – Porting µ C/OS-II: Development Tools – Directories and Files – Testing a Port - IAR Workbench with µ C/OS-II - µ C/OS-II Porting on a 8051 CPU – Implementation of Multitasking - Implementation of Scheduling and Rescheduling – Analyze the Multichannel ADC with help of µ C/OS-II.

Total Hours: 45

REFERENCES:

17BEECOE02 CONSUMER ELECTRONICS

COURSE OBJECTIVES:

- To study about various speakers and microphone
- To learn the fundamental of television systems and standards
- To learn the process of audio recording and reproduction
- To study the various telephone networks

LEARNING OUTCOMES:

- Gain knowledge about various speakers and microphone
- Gain knowledge about the fundamental of television systems and standards
- Gain knowledge about the process of audio recording and reproduction
- Gain knowledge about the various telephone networks

UNIT I LOUDSPEAKERS AND MICROPHONES (9)

UNIT – II TELEVISION STANDARDS AND SYSTEMS (9)

UNIT – III OPTICAL RECORDING AND REPRODUCTION (9)

UNIT – IV TELECOMMUNICATION SYSTEMS (9)
Telephone services - telephone networks – switching system principles – PAPX switching – Circuit, packet and message switching, LAN, MAN and WAN, Integrated Services Digital Network. Wireless Local Loop. VHF/UHF radio systems, Limited range Cordless Phones; cellular modems

UNIT – V HOME APPLIANCES (9)
Basic principle and block diagram of microwave oven; washing machine hardware and software; components of air conditioning and refrigeration systems.

Total Hours: 45

TEXT BOOK:

COURSE OBJECTIVES

- To introduce the basic concepts of neural networks and its applications in various domain
- To educate how to use Soft Computing to solve real-world problems
- To have a solid understanding of Basic Neural Network.

LEARNING OUTCOMES:

- Understand the basic concepts of neural networks and its applications in various domain
- Ability to develop the use of Soft Computing to solve real-world problems
- Understand the Basic Neural Network.

UNIT I  INTRODUCTION TO NEURAL NETWORKS  (9)
Introduction - biological neurons and their artificial models - learning, adaptation and neural network's learning rules - types of neural networks- single layer, multiple layer- feed forward, feedback networks

UNIT II  LEARNING PROCESS  (9)

UNIT III  PERCEPTION  (9)
Single layer perception-Adaptive filtering-unconstrained optimization-Least-mean square algorithm-Leaning curve-Annealing Technique-perception convergence theorem-Relationship between perception and Baye’s classifier-Back propagation algorithm

UNIT IV  ATTRACTOR NEURAL NETWORK AND ART  (9)

UNIT V  SELF ORGANIZATION  (9)

Total Hours: 45

REFERENCES:

1. Simon Haykin, “Neural Networks and Learning Machines” -3/E - Pearson/ Prentice Hall 2009
2. Satish Kumar- “Neural Networks : A Classroom Approach”-TMH-2008
COURSE OBJECTIVES:
- To introduce the basic concepts of Fuzzy logic and its applications in various domain
- To educate how to use Fuzzy computation to solve real-world problems
- To have a solid understanding of Basic fuzzy models.

LEARNING OUTCOMES:
- Understand the basic concepts of Fuzzy logic and its applications in various domain
- Ability to develop how to use Fuzzy computation to solve real-world problems
- Understand basic fuzzy models.

UNIT – I
Basics Of Fuzzy Logic: Fuzzy sets, Properties of fuzzy sets, operation in fuzzy sets, fuzzy relations, the extension principle

UNIT – II
Theory Of Approximate Reasoning: Linguistic variables, Fuzzy proportions, Fuzzy if-then statements, inference rules, compositional rule of inference-fuzzy models

UNIT – III
Fuzzy Knowledge Based Controllers (Fkbc): Basic concept structure of FKBC, choice of membership functions, scaling factors, rules, fuzzyfication and defuzzyfication procedures – Design of Fuzzy Logic Controller

UNIT – IV

UNIT V FUZZY BASED SYSTEMS
Simple applications of FKBC -washing machines- traffic regulations -lift control-fuzzy in medical applications-Introduction to ANFIS.

Total Hours: 45

TEXT BOOKS:
OPEN ELECTIVES OFFERED BY BIO – TECHNOLOGY
COURSE OBJECTIVES:
- To understand the basic design of bioreactors
- To understand the principle of heat transfer inside a bioreactor

LEARNING OUTCOMES:
- To design bioreactors for various operations
- To select the appropriate separation equipment based on the nature of the product

UNIT I ENGINEERING PROPERTIES AND STORAGE TANK (9)
Introduction to various mechanical properties of material to be used material of construction, design of cylindrical storage tank.

UNIT II REACTOR DESIGN (9)
Design of Airlift fermentor, Bubble column reactor and Continuous stirred tank reactor.

UNIT III HEAT TRANSFER EQUIPMENTS (9)
Design of Shell and tube Heat exchanger, Double pipe heat exchanger, long tube vertical evaporator and forced circulation evaporator.

UNIT IV MASS TRANSFER EQUIPMENTS (9)
Design of Bollmann extractor, fractionating column, packed tower and spray tray absorber

UNIT V SEPARATION EQUIPMENTS (9)
Design of plate and frame filter press, leaf filter, rotary drum filter, disc bowl centrifuge, rotart drum drier and Swenson –walker crystallizer.

Total Hours: 45

TEXTBOOKS:

REFERENCES:
COURSE OBJECTIVES:
- To understand the importance of food processing
- To make the students learn the various processing and preservation techniques.

LEARNING OUTCOMES:
The students are exposed to
- Properties of food material
- Various methods used for preserving fruits and vegetables.

UNIT I  SCOPE AND IMPORTANCE OF FOOD PROCESSING (9)
Properties of food- Physical, thermal, mechanical, sensory. Raw material Preparation - Cleaning, sorting, grading, peeling.

UNIT II  PROCESSING METHODS (9)

UNIT III  FOOD CONVERSION OPERATIONS (9)
Size reduction- Fibrous foods, dry foods and liquid foods- Theory and equipments- membrane separation- filtration- equipment and application.

UNIT IV  FOOD PRESERVATION BY COOLING (9)
Refrigeration, Freezing-Theory, freezing time calculation, methods of freezing, freezing equipments, freeze drying, freeze concentration, thawing, effect of low temperature on food. Water activity, methods to control water activity.

UNIT V  PRESERVATION METHODS FOR FRUITS AND VEGETABLES (9)
Pre processing operations - preservation by reduction of water content: drying / dehydration and concentration – chemical preservation – preservation of vegetables by acidification, preservation with sugar - Heat preservation- Food irradiation- Combined preservation techniques.

Total Hours: 45

TEXT BOOKS:
3. Mircea Enachescu Dauthy Fruit and Vegetable Processing FAO agricultural services bulletin no.119 1995
REFERENCES:
2. B. Sivasankar Food processing and preservation PHI Learning Pvt. Ltd 2002
COURSE OBJECTIVES:
- To enable the students to get aware of available tools and databases for performing research in bioinformatics.
- To provide the thorough understanding of protein structure in detail.

LEARNING OUTCOMES:

At the end of the course,
- The students will understand the importance of Bioinformatics in various sectors.
- The students will be exposed to biological database management and microarray technology.

UNIT I OVERVIEW OF BIOINFORMATICS (9)
The scope of bioinformatics; bioinformatics & the internet; useful bioinformatics sites. Data acquisition: sequencing DNA, RNA & proteins; determination of protein structure; gene & protein expression data; protein interaction data. Databases – contents, structure & annotation: file formats; annotated sequence databases; miscellaneous databases.

UNIT II RETRIEVAL OF BIOLOGICAL DATA (9)
Data retrieval with Entrez & DBGET/ LinkDB; data retrieval with SRS (sequence retrieval system). Searching sequence databases by sequence similarity criteria: sequence similarity searches; amino acid substitution matrices; database searches, FASTA & BLAST; sequence filters; iterative database searches & PSI-BLAST. Multiple-sequence alignment, gene & protein families: multiple-sequence alignment & family relationships; protein families & pattern databases; protein domain families.

UNIT III PHYLOGENETICS (9)
Phylogenetics, cladistics & ontology; building phylogenetic trees; evolution of macromolecular sequences. Sequence annotation: principles of genome annotation; annotation tools & resources.

UNIT IV STRUCTURAL BIOINFORMATICS (9)
Conceptual models of protein structure; the relationship of protein three-dimensional structure to protein function; the evolution of protein structure & function; obtaining, viewing & analyzing structural data; structural alignment; classification of proteins of known three-dimensional structure: CATH & SCOP; introduction to protein structure prediction; structure prediction by comparative modeling; secondary structure prediction; advanced protein structure prediction & prediction strategies.
UNIT V MICROARRAY DATA ANALYSIS

Microarray data, analysis methods; microarray data, tools & resources; sequence sampling & SAGE. Bioinformatics in pharmaceutical industry: informatics & drug discovery; pharmainformatics resources. Basic principles of computing in bioinformatics: running computer software; computer operating systems; software downloading & installation; database management.

Total Hours: 45

TEXTBOOKS:

3. David W. Mount Sequence and Genome Analysis Cold Spring Harbor Laboratory 2004

REFERENCES:

COURSE OBJECTIVES:
- To develop skills of the students in the field of nano biotechnology and its applications in various fields.
- The course will serve as an effective course to understand Socio-economic issues of nanobiotechnology.

LEARNING OUTCOMES:
At the end of the course,
- The students will be able to identify the potential areas where nanoparticles can be utilized.
- The students will be exposed to the ethical issues regarding the use of nanoparticles.

UNIT I INTRODUCTION

UNIT II NANO PARTICLES

UNIT III APPLICATIONS

UNIT IV NANOBIO TECHNOLOGY

UNIT V ETHICAL ISSUES IN NANO TECHNOLOGY
TEXT BOOKS:

2. Goodsell, D.S. Bionanotechnology John Wiley and Sons, Inc 2004

REFERENCES:

OPEN ELECTIVES OFFERED BY MECHANICAL ENGINEERING
17BEMEOE01 COMPUTER AIDED DESIGN

COURSE OBJECTIVE:

- To provide an overview of how computers are being used in mechanical component design

UNIT I OVERVIEW OF CAD SYSTEMS (9)

Conventional and computer aided design processes-advantages and disadvantages. Subsystems of CAD-CAD hardware and software, analytical and graphics packages, CAD workstations. Networking of CAD systems

UNIT II INTERACTIVE COMPUTER GRAPHICS AND GRAPHICS TRANSFORMATIONS (9)


UNIT III GEOMETRIC MODELING (9)


UNIT IV PARAMETRIC DESIGN AND OBJECT REPRESENTATION (9)


UNIT V PRODUCT DESIGN AND DEVELOPMENT (9)


Total Hours: 45

TEXT BOOKS:

2. Radhakrishnan P and Subramanyan S CAD/CAM/CIM New Age International Pvt. Ltd 2004

REFERENCES

COURSE OBJECTIVE:

- Upon completion of this course, the students can able to understand the role of logistics and understand the phases of supply chain

UNIT I INTRODUCTION TO LOGISTICS (9)

Logistics - concepts, definitions and approaches, factors influencing logistics - Supply chain: basic tasks, definitions and approaches, influencing supply chain - a new corporate model.

UNIT II PHASES OF SUPPLY CHAIN (9)

The new paradigm shift - The modular company - The network relations - Supply processes - Procurement processes - Distribution management.

UNIT III EVOLUTION OF SUPPLY CHAIN MODELS (9)

Strategy and structure - Factors of supply chain - Manufacturing strategy stages - Supply chain progress - Model for competing through supply chain management - PLC grid, supply chain redesign - Linking supply chain with customer

UNIT IV SUPPLY CHAIN ACTIVITIES (9)

Structuring the SC, SC and new products, functional roles in SC - SC design frame- work - Collaborative product commerce (CPC).

UNIT V SCM ORGANISATION AND INFORMATION SYSTEM (9)

The management task - Logistics organization - The logistics information systems - Topology of SC application - Product Data Management - Warehouse management system MRP- I, MRP - II, ERP., - Case study, ERP Software's

Total Hours: 45

TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVE:guns

- Upon completion of this course, the students can able to understand the relationship between free energy, entropy, internal energy, and enthalpy

UNIT I INTRODUCTION AND BASIC CONCEPTS (9)

General overview of transport phenomena including various applications, Transport of momentum, heat and mass, Transport mechanism, Level of transport, Driving forces, Molecular transport (diffusion), convective transport (microscopic)

UNIT II PROPERTIES, UNITS AND OTHER PHYSICAL PARAMETERS (9)

Unit systems, temperature, mole, concentration, pressure, Gas laws, laws of conservation, energy and heat units

UNIT III MOMENTUM TRANSPORT (9)

Basic concepts in fluid mechanics, Force, unit and dimensions, pressure in fluid, head of fluid, Molecular transport for momentum, heat and mass transfer, Viscosity of fluids, Newton's law, Momentum transfer, Newtonian and non-Newtonian fluids, Fluid flow and Reynolds number, Overall mass balance, Control volume and Continuity equation, Overall energy balance, Bernoulli's equation, Overall momentum balance, Drag coefficient, Stokes law, Flow in packed beds, Flow in fluidized bed

UNIT IV ENERGY TRANSPORT (9)

Basic concepts in heat transfer, Heat transfer mechanisms, Fourier's law of heat conduction, thermal conductivity, convective heat transfer coefficient, Conduction heat transfer - through flat slab/wall and through hollow cylinder, Conduction through solids in series, Forced convection heat transfer inside pipes, Heat transfer outside various geometrics in forced convection, General discussion on natural convection heat transfer, Heat exchangers, General discussion on radiation heat transfer

UNIT V MASS TRANSPORT (9)

Basic concepts in mass transport, Some application examples, Modes of mass transfer, Molecular diffusion- Fick's law, Analogy between mass, heat and momentum transfer, Dispersion, Hydraulic or Darcy's flow in porous media, Chemical kinetics and activation energy, Film theory, Convective mass transfer, Liquid-solid mass transfer, Liquid-liquid mass transport, Gas-liquid mass transfer, Aeration and oxygen transport, Air stripping

Total Hours: 45

REFERENCE:


WEBSITES:

1. https://laulima.hawaii.edu/portal
COURSE OBJECTIVE:

- Biomechanics provides key information on the most effective and safest movement patterns, equipment, and relevant exercises to improve human movement.

UNIT I  INTRODUCTION

Biomechanics - Improving Performance – Applications - Preventing And Treating Injury - Qualitative And Quantitative Analysis - Scholarly Societies - Computer Searches – Biomechanical Knowledge versus Information - Kinds of Sources - Evaluating Sources

UNIT II  KEY MECHANICAL CONCEPTS

Mechanics - Basic Units - Nine Fundamentals of Biomechanics - Principles and Laws - Nine Principles for Application of Biomechanics

UNIT III  HUMAN ANATOMY AND SOME BASIC TERMINOLOGY


UNIT IV  ANATOMICAL DESCRIPTION

Key Anatomical Concepts - Directional Terms - Joint Motions - Muscle Actions - Active and Passive Tension of Muscle - Limitations of Functional Anatomical Analysis - Mechanical Method of Muscle Action Analysis - The Need for Biomechanics to Understand Muscle Actions - Sports Medicine and Rehabilitation Applications

UNIT V  MECHANICS OF THE MUSCULOSKELETAL SYSTEM


Total Hours: 45

REFERENCES:


2. C. Ross Ethier Craig A. Simmons Introductory Biomechanics Cambridge University Press 2007
OPEN ELECTIVES OFFERED BY AEROSPACE ENGINEERING
COURSE OBJECTIVE:

- To provide in-depth knowledge on various techniques of non-destructive testing

UNIT I INTRODUCTION (9)

Properties of Materials – Characteristics of Ferrous, Non-ferrous and Alloys. Destructive testing and Non-destructive testing – Classification – Uses and applications. Codes, Standards and Specifications (ASME, ASTM, AWS etc.).

UNIT II PENETRANT TESTING AND MAGNETIC PARTICLE INSPECTION (9)

Introduction to Penetrant Testing – Liquid Penetrants and Dye Penetrants - An Illustration of Penetrant Testing, Advantages of Penetrant Testing, Disadvantages of Penetrant Testing. Introduction to Magnetic Particle Inspection - An Illustration of Magnetic Particle Inspection, Advantages of Magnetic Particle Crack Detection, Disadvantages of Magnetic Particle Crack Detection

UNIT III ULTRASONIC FLAW DETECTION AND RADIOGRAPHY INSPECTION (9)


UNIT IV EDDY CURRENT AND ELECTRO-MAGNETIC METHODS (9)


UNIT V NON-DESTRUCTIVE INSPECTION (NDI) AND ITS APPLICATIONS (9)

Inspection of Raw Products, Inspection For In-Service Damage, Power Plant Inspection, Storage Tank Inspection, Aircraft Inspection, Jet Engine Inspection, Pressure Vessel Inspection, Bridge Inspection, Pipeline Inspection.

Total Hours: 45
TEXT BOOKS:


REFERENCES:


WEBSITES:

1. https://www.asnt.org/MinorSiteSections/AboutASNT/Intro-to-NDT
2. https://www.asnt.org/
3. www.bindt.org/
4. www.ndt.net/
COURSE OBJECTIVES:

- Ability to design UAV system
- Ability to identify different hardware for UAV

UNIT I  INTRODUCTION TO UAV  (9)
History of UAV –classification – Introduction to Unmanned Aircraft Systems–models and prototypes – System Composition-applications

UNIT II  THE DESIGN OF UAV SYSTEMS  (9)

UNIT III  AVIONICS HARDWARE  (9)
Autopilot – AGL-pressure sensors-servos-accelerometer –gyros-actuators- power supply-processor, integration, installation, configuration, and testing

UNIT IV  COMMUNICATION PAYLOADS AND CONTROLS  (9)
Payloads-Telemetry-tracking-Aerial photography-controls-PID feedback-radio control frequency range –modems-memory system-simulation-ground test-analysis-trouble shooting

UNIT V  THE DEVELOPMENT OF UAV SYSTEMS  (9)
Waypoints navigation-ground control software- System Ground Testing- System In-flight Testing- Future Prospects and Challenges-Case Studies – Mini and Micro UAVs.

Total Hours: 45

TEXT BOOKS:
1. Reg Austin Unmanned Aircraft Systems UAV design, development and deployment

REFERENCES:
2. Introduction to Unmanned Aircraft Systems Taylor & Francis Ltd, Abingdon 2011

WEBSITES:
1. www.draganfly.com/.../introduction-to-unmanned-aerial-vehicles-uavs/
2. rahauav.com/Library/.../Unmanned-Air-Systems
   spaceflight.nasa.gov/shuttle/reference/shutref/orbiter/.../plcomm.html
4. www.theuav.com/
COURSE OBJECTIVE:

- To study the procedure of the formation of aerodrome, its design and the concepts of air transportation

UNIT - I INTRODUCTION (9)

Development of air transportation, comparison with other modes of transport – Role of IATA, ICAO – The general aviation industry airline – Factors affecting general aviation, use of aircraft, airport: airline management and organization – levels of management, functions of management, Principles of organization planning the organization – chart, staff departments & line departments.

UNIT - II AIRLINE ECONOMICS (9)

Forecasting – Fleet size, Fleet planning, the aircraft selection process, operating cost, passenger capacity, load factor etc. – Passenger fare and tariffs – Influence of geographical, economic & political factors on routes and route selection.


UNIT - III PRINCIPLES OF AIRLINES SCHEDULING (9)

Equipment maintenance, Flight operations and crew scheduling, Ground operations and facility limitations, equipments and types of schedule – hub & spoke scheduling, advantages / disadvantages & preparing flight plans – Aircraft scheduling in line with aircraft maintenance practices.

UNIT - IV AERODROME DATA, PHYSICAL CHARACTERISTICS AND OBSTACLE RESTRICTION (9)


UNIT - V VISUAL AIDS FOR NAVIGATION, VISUAL AIDS FOR DENOTING OBSTACLES EMERGENCY AND OTHER SERVICES (9)

Visual aids for navigation Wind direction indicator – Landing direction indicator – Location and characteristics of signal area – Markings, general requirements – Various markings – Lights, general requirements – Aerodrome beacon, identification beacon – Simple approach lighting system and various lighting systems – VASI & PAPI - Visual aids for denoting obstacles; object to be marked and lighter – Emergency and other services.

Total Hours: 45
TEXT BOOKS:

REFERENCES:

WEBSITES:
1. www.grc.nasa.gov/WWW/k-12/airplane/
4. www.britannica.com/EBchecked/topic/.../Aircraft-configurations
5. www.brown.edu/Departments/EEB/EML/.../principles_flight.html
COURSE OBJECTIVE:

- To introduce the basic concepts of various avionics systems of aircraft

UNIT I   INTRODUCTION TO AVIONICS (9)

Need for avionics in civil and military aircraft and space systems – integrated avionics and weapon systems – typical avionics subsystems, design, technologies – Introduction to digital computer and memories.

UNIT II   DIGITAL AVIONICS ARCHITECTURE (9)


UNIT III  FLIGHT DECKS AND COCKPITS (9)

Control and display technologies: CRT, LED, LCD, EL and plasma panel – Touch screen – Direct voice input (DVI) – Civil and Military Cockpits: MFDS, HUD, MFK, HOTAS.

UNIT IV   INTRODUCTION TO NAVIGATION SYSTEMS (9)


UNIT V   AIR DATA SYSTEMS AND AUTO PILOT (9)

Air data quantities – Altitude, Air speed, Vertical speed, Mach Number, Total air temperature, Mach warning, Altitude warning – Auto pilot – Basic principles, Longitudinal and lateral auto pilot.

Total Hours: 45

TEXT BOOKS:

REFERENCES:
1. Ian Moir, Allan Seabridge, Malcolm Jukes Civil Avionics Systems John Wiley & Sons, New Jersey, USA. 2013

WEBSITES:
1. www.ntps.edu/courses/116-introduction-to-avionics-systems-course
2. www.ece.ucsb.edu/courses/ECE152/152A_Su11Shynk/Lec1.pdf
4. www.pbase.com/bruceleibowitz/cockpit
5. www.cranfield.ac.uk/soe/shortcourses/.../avionics-introduction.html
OPEN ELECTIVES OFFERED BY AUTOMOBILE ENGINEERING
COURSE OBJECTIVE:

- This course enables the students to know about all the main and auxiliary systems of automobile with its base construction and working.

UNIT-I ENGINE AND FUEL FEED SYSTEMS (9)

Classification of Engine, construction and working of four stroke petrol and diesel engine, firing order and its significance. Carurettor working principle, requirements of an automotive carburettor, Petrol injection Systems (MPFI, TBI), Diesel fuel injection systems (CRDI).

UNIT –II TRANSMISSION SYSTEMS (9)


UNIT -III SUSPENSION SYSTEM (9)


UNIT-IV BRAKES (9)


UNIT -V ELECTRICAL SYSTEM (9)

Principle and construction of lead acid battery. Lighting system: details of head light and side light, LED lighting system, head light dazzling and preventive methods – Horn, wiper system and trafficator. Starting System and charging system.

Total Hours: 45
TEXT BOOKS

3. Dr.Kirpal Singh Automobile Engineering Standard Publishes 2011

REFERENCES

COURSE OBJECTIVE:

- The objective of this course is to make the students to know and understand the constructional details, operating characteristics and design aspects of Two and Three wheelers.

UNIT I INTRODUCTION

Classifications- design considerations –weight and dimension limitations – requirements stability problems, gyroscopic effect- pendulum effect of two and three wheelers.

UNIT II POWER UNITS, IGNITION SYSTEMS AND OTHER ELECTRICAL SYSTEMS

2 stoke and 4 stoke SI engines and CI engines design criteria– design of cylinders, cylinder head, cooling fins, crank case, connecting rod and crank shaft. Carburettor types and design. Battery coil ignition, magneto ignition and electronic ignition. Lighting and other electrical system.

UNIT III CLUTCHES AND TRANSMISSION

Types of clutches for 2 and 3 wheelers. Design of clutch system. Gears for two and three wheelers. Design of gear box and gear change mechanism. Belt, chain and shaft drive. Freewheeling devices, starting systems.

UNIT IV FRAMES, SUSPENSION, WHEELS AND TYRES

Types of frames used for two wheelers and three wheelers. Wheel frames- construction design of frames for fatigue strength torsional stiffness and lateral stability. Front and rear forks. Springs for suspension, Dampers, constructional details of wheel and tyres.

UNIT V THREE WHEELERS

Auto rickshaws, different types, Pick-Ups and delivery type vehicle, frames and transmission for 3 wheelers wheel types, wheel attachment tyre types. Brakes and their operating mechanism.

TEXT BOOKS:


REFERENCES:

COURSE OBJECTIVE:

- The objective of this course is to make the students to know and understand the maintenance and fault diagnosis of basic systems in Automobile.

UNIT I MAINTENANCE OF RECORDS AND SCHEDULES (9)

Importance of maintenance, preventive (scheduled) and breakdown (unscheduled) maintenance, requirements of maintenance, preparation of check lists, Inspection schedule, maintenance of records, log sheets and other forms, safety precautions in maintenance.

UNIT II ENGINE MAINTENANCE (9)

Dismantling of engine components and cleaning, cleaning methods, visual and dimensional inspections, minor and major reconditioning of various components, reconditioning methods, engine assembly, special tools used for maintenance overhauling, engine tune up.

UNIT III CHASSIS MAINTENANCE (9)

Mechanical and automobile clutch and gear box, servicing and maintenance, maintenance servicing of propeller shaft and differential system, Maintenance servicing of suspension systems. Brake systems, types and servicing techniques, Steering systems, overhauling and maintenance. Wheel alignment, computerized alignment and wheel balancing.

UNIT IV ELECTRICAL SYSTEM MAINTENANCE (9)

Testing methods for checking electrical components, checking battery, starter motor, charging systems, DC generator and alternator, ignitions system, lighting systems, Fault diagnosis and maintenance of modern electronic controls, checking and servicing of dash board instruments.

UNIT V MAINTENANCE OF FUEL SYSTEM, COOLING SYSTEMS, LUBRICATION SYSTEM AND VEHICLE BODY (9)

Servicing and maintenance of fuel system of different types of vehicles, calibration and tuning of engine for optimum fuel supply, Cooling systems, water pump, radiator, thermostat, anticorrosion and antifreeze additives, Lubrication maintenance, lubricating oil changing, greasing of parts, Vehicle body maintenance, minor and major repairs. Door locks and window glass actuating system maintenance.

Total Hours: 45

TEXT BOOKS:

3. Service Manuals from Different Vehicle Manufacturers
COURSE OBJECTIVE:

- This course enables the students to have a knowledge about the recent technologies that is in use in automobile.

UNIT I  TRENDS IN POWER PLANTS (9)


UNIT II  DRIVER ASSISTANCE SYSTEMS (9)

Collision Avoidance Systems, Adaptive cruise control, adaptive noise control, anti spin regulation, traction control systems, cylinder cut- off technology, ABS, Driver Drowsiness Detection system

UNIT III  SUSPENSION BRAKES AND SAFETY (9)

Air suspension - Closed loop suspension - antiskid braking system, Retarders, Regenerative braking safety cage - air bags - crash resistance - passenger comfort.

UNIT IV  NOISE & POLLUTION (9)

Reduction of noise - Internal & external pollution control through alternate fuels/power plants – Catalytic converters and filters for particulate emission.

UNIT V  TELEMATICS (9)

Global positioning systems, geographical information systems, navigation systems, automotive vision system, road recognition

Total Hours: 45

TEXT BOOKS:


REFERENCES:

OPEN ELECTIVES OFFERED BY CIVIL ENGINEERING
COURSE OBJECTIVE:

- At the end of the this course the students should have learnt the basic terms of housing programmes, planning and designing of housing projects, construction techniques and cost effective materials and housing finance and project appraisal techniques.

UNIT I INTRODUCTION TO HOUSING (9)

Definition of Basic Terms – House, Home, Household, Apartments, Multi storeyed Buildings, Special Buildings, Objectives and Strategies of National Housing Policies, Principle of Sustainable Housing, Housing Laws at State level, Bye-laws at Urban and Rural Local Bodies – levels - Development Control Regulations, Institutions for Housing at National, State and Local levels

UNIT II HOUSING PROGRAMMES (9)

Basic Concepts, Contents and Standards for Housing Programmes - Sites and Services, Neighbourhoods, Open Development Plots, Apartments, Rental Housing, Co-operative Housing, Slum Housing Programmes, Role of Public, Private and Non-Government Organisations.

UNIT III PLANNING AND DESIGN OF HOUSING PROJECTS (9)

Formulation of Housing Projects – Site Analysis, Layout Design, Design of Housing Units (Design Problems)

UNIT IV CONSTRUCTION TECHNIQUES AND COST-EFFECTIVE MATERIALS (9)

New Constructions Techniques – Cost Effective Modern Construction Materials, Building Centers – Concept, Functions and Performance Evaluation

UNIT V HOUSING FINANCE AND PROJECT APPRAISAL (9)


Text Books:


References:

2. UNCHS, National Experiences with Shelter Delivery for the Poorest Groups, UNCHS (Habitat), Nairobi, 2000.
COURSE OBJECTIVE:

- At the end of this course the students should have learnt various machineries of construction, electrical systems in building, design and principle of illumination, refrigeration principle and application and various fire safety installations.

UNIT I  MACHINERIES (9)

Hot Water Boilers – Lifts and Escalators – Special features required for physically handicapped and elderly – Conveyors – Vibrators – Concrete mixers – DC/AC motors – Generators – Laboratory services – Gas, water, air and electricity

UNIT II  ELECTRICAL SYSTEMS IN BUILDINGS (9)


UNIT III  PRINCIPLES OF ILLUMINATION & DESIGN (9)


UNIT IV  REFRIGERATION PRINCIPLES & APPLICATIONS (9)


UNIT V  FIRE SAFETY INSTALLATION (9)


Total Hours: 45
TEXT BOOKS:

REFERENCES:
COURSE OBJECTIVE:
• At the end of this course the students should have learnt the irrigation system requirements, irrigation scheduling, strategies in water use management, canal operation places and involvement of stake holder

UNIT I  IRRIGATION SYSTEM REQUIREMENTS  (9)

UNIT II  IRRIGATION SCHEDULING  (9)
Time of irrigation – Critical stages of water need of crops – Criteria for scheduling irrigation – Frequency and interval of irrigation

UNIT III  MANAGEMENT  (9)
Structural and non-structural strategies in water use and management – Conjunctive use of surface and ground waters – Quality of irrigation water.

UNIT IV  OPERATION  (9)
Operational plans – Main canals, laterals and field channels – Water control and regulating structures – Performance indicators – Case study

UNIT V  INVOLVEMENT OF STAKE HOLDERS  (9)
Farmer’s participation in System operation – Water user’s associations – Farmer councils – Changing paradigms on irrigation management – Participatory irrigation management

Total Hours: 45

TEXT BOOKS:


REFERENCES:


COURSE OBJECTIVE:

- At the end of this course, the students should have learnt the modern construction methods, methods for special structures, modern equipments used for excavation, conveyance etc and principles and practices of temporary structures.

UNIT - I  MODERN CONSTRUCTION METHODS  (9)

Open Excavation, Shafts and Tunnels- Preparation of foundation, Cofferdams, Caisson, Piled Foundation, Prestressed Concrete Construction, Pre-cast Concrete Construction.

UNIT - II  CONSTRUCTION METHODS FOR SPECIAL STRUCTURES  (9)


UNIT - III  MODERN CONSTRUCTION EQUIPEMENTS -I  (9)

Construction Equipment used for Earth Moving, Excavating, Drilling, Blasting, Tunneling and hoisting

UNIT - IV  MODERN CONSTRUCTION EQUIPEMENTS -II  (9)

Construction Equipment used for Conveying, Hoisting, Dredging, Dewatering Systems, Paving and concreting Plant

UNIT - V  PRINCIPLES AND PRACTICES OF TEMPORARY STRUCTURES  (9)

Principles and Practices of Temporary structures, Shoring, and Strutting, Underpinning, Principles and Design of Formwork, Scaffolding, Operation and maintenance of construction equipments

Total Hours: 45

TEXT BOOKS:

REFERENCES:
2. Nunnaly, S.W., Construction Methods and Management , Prentice – Hall, 2000