ANNA UNIVERSITY CHENNAI
CHENNAI - 600 025
UNIVERSITY DEPARTMENTS
REGULATIONS 2012
CURRICULA AND SYLLABI FOR I TO VIII SEMESTERS
B.E. COMPUTER SCIENCE & ENGINEERING
(FULL TIME)
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<td>Human Rights</td>
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OBJECTIVES:

• To enable all students of engineering and technology develop their basic communication skills in English.
• To give special emphasis to the development of speaking skills amongst the students of engineering and technology.
• To ensure that students use the electronic media such as internet and supplement the learning materials used in the classroom.
• To inculcate the habit of reading for Pleasure.

UNIT I
Listening - Introducing learners to GIE - Types of listening - Listening to audio (verbal & sounds); Speaking - Speaking about one’s place, important festivals etc. – Introducing oneself, one’s family / friend; Reading - Skimming a reading passage – Scanning for specific information - Note-making; Writing - Free writing on any given topic (My favourite place / Hobbies / School life, etc.) - Sentence completion - Autobiographical writing (writing about one’s leisure time activities, hometown, etc.);
Grammar - Prepositions - Reference words - Wh-questions - Tenses (Simple); Vocabulary - Word formation - Word expansion (root words / etymology); E-materials - Interactive exercises for Grammar & Vocabulary - Reading comprehension exercises - Listening to audio files and answering questions.

UNIT II
Listening - Listening and responding to video lectures / talks; Speaking - Describing a simple process (filling a form, etc.) - Asking & answering questions - Telephone skills – Telephone etiquette; Reading – Critical reading - Finding key information in a given text - Sifting facts from opinions; Writing - Biographical writing (place, people) - Lab descriptions (general/specific description of laboratory experiments) - Definitions - Recommendations; Grammar - Use of imperatives - Subject-verb agreement; Vocabulary - Compound words - Word Association; E-materials - Interactive exercises for Grammar and Vocabulary - Listening exercises with sample telephone conversations / lectures – Picture-based activities.

UNIT III
Listening - Listening to specific task - focused audio tracks; Speaking - Role-play – Simulation - Group interaction - Speaking in formal situations (teachers, officials, foreigners);
Reading
- Reading and interpreting visual material; Writing - Jumbled sentences - Coherence and cohesion in writing - Channel conversion (flowchart into process) - Types of paragraph (cause & effect / compare & contrast / narrative / analytical) - Informal writing (letter/e-mail/blogs) - Paraphrasing; Grammar - Tenses (Past) - Use of sequence words - Adjectives; Vocabulary - Different forms and uses of words, Cause and effect words; E-materials - Interactive exercises for Grammar and Vocabulary - Excerpts from films related to the theme and follow up exercises - Pictures of flow charts and tables for interpretations.

UNIT IV
Listening - Watching videos / documentaries and responding to questions based on them; Speaking - Responding to questions - Different forms of interviews - Speaking at different types of interviews; Reading - Making inference from the reading passage - Predicting the content of a reading passage; Writing - Interpreting visual materials (line graphs, pie charts etc.) - Essay writing – Different types of essays; Grammar - Adverbs – Tenses – future time reference; Vocabulary - Single word substitutes - Use of abbreviations & acronyms; E-materials - Interactive exercises for Grammar and Vocabulary - Sample interviews - film scenes - dialogue writing.

UNIT V
Listening - Listening to different accents, Listening to Speeches / Presentations, Listening to broadcast & telecast from Radio & TV; Speaking - Giving impromptu talks, Making presentations on given topics; Reading - Email communication - Reading the attachment files having a poem/joke/proverb - Sending their responses through email Writing - Creative writing, Poster making; Grammar - Direct and indirect speech; Vocabulary - Lexical items (fixed / semi fixed expressions); E-materials - Interactive exercises for Grammar & Vocabulary
- Sending emails with attachment – Audio / video excerpts of different accents, - Interpreting posters

TOTAL: 60 PERIODS

OUTCOMES:
Learners should be able to:

- Speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.
- Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
- Read different genres of texts adopting various reading strategies.
- Listen/view and comprehend different spoken discourses/excerpts in different accents.
TEXT BOOKS:

REFERENCES:

Extensive Readers:

Website Resources:
1. www.uefap.com
2. www.eslcafe.com
3. www.listen-to-english.com
4. www.owl.english.purdue.edu
5. www.chompchomp.com
OBJECTIVES:

- To develop the use of matrix algebra techniques. This is needed by engineers for practical applications.
- To make the student knowledgeable in the area of infinite series and their convergence so that he/she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling.
- To familiarize the student with functions of several variables. This is needed in many branches of engineering.
- To introduce the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.

UNIT I  MATRICES


UNIT II  INFINITE SERIES


UNIT III  FUNCTIONS OF SEVERAL VARIABLES


UNIT IV  IMPROPER INTEGRALS

UNIT V  MULTIPLE INTEGRALS 9+3


TOTAL : 60 PERIODS

OUTCOMES:
- This course equips students to have basic knowledge and understanding in one fields of materials, integral and differential calculus.

TEXT BOOKS:

REFERENCES:

PH8151 ENGINEERING PHYSICS  (Common to ALL Branches of B.E./B.Tech. Programmes) 3 0 0 3

OBJECTIVE:
To introduce the basic physics concepts relevant to different branches of Engineering and Technology.
UNIT I PROPERTIES OF MATTER


UNIT II ACOUSTICS AND ULTRASONICS


UNIT III THERMAL PHYSICS


UNIT IV APPLIED OPTICS


UNIT V SOLID STATE PHYSICS

Nature of bonding - growth of single crystals (qualitative) - crystal systems - crystal planes and directions - expressions for interplanar distance - coordination number and packing factor for simple structures: SC, BCC, FCC and HCP - structure and significance of NaCl, ZnS, diamond and graphite - crystal imperfections: point defects, dislocations and stacking faults - unit cell, Bravais space lattices - miller indices.

TOTAL : 45 PERIODS
OUTCOMES:
The students will have knowledge on the basics of physics related to properties of matter, Optics, acoustics etc., and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications

TEXT BOOKS:

REFERENCES:

OBJECTIVES:
- To make the students acquire sound knowledge of second law of thermodynamics and second law based derivations of importance in engineering applications in all disciplines.
- To make the students conversant with basics of polymer chemistry.
- To make the students understand the concepts of Kinetics and Catalysis
- To acquaint the student with concepts of important photophysical and photochemical processes and spectroscopy.
- To acquaint the students with the basics of nano materials, their properties and applications.

UNIT I CHEMICAL THERMODYNAMICS 9
Second law: Entropy - entropy change for an ideal gas, reversible and irreversible processes;entropy of phase transitions; Clausius inequality. Free energy and work function: Helmholtz and Gibbs free energy functions; Criteria of spontaneity; Gibbs-Helmholtz equation; Clausius- Clapeyron equation; Maxwell relations – Van’t Hoff isotherm and isochore. Chemical potential; Gibbs-Duhem equation – variation of chemical potential with temperature and pressure.
UNIT II  POLYMER CHEMISTRY
Introduction: Classification of polymers – Natural and Synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerisation. Types and mechanism of polymerisation: Addition (Free Radical, cationic, anionic and living); condensation and copolymerisation. Properties of polymers: Tg, Tacticity, Molecular weight – weight average, number average and polydispersity index. Techniques of polymerisation: Bulk, emulsion, solution and suspension.

UNIT III  KINETICS AND CATALYSIS

UNIT IV  PHOTOCHEMISTRY AND SPECTROSCOPY

UNIT V  NANO CHEMISTRY

TOTAL : 45 PERIODS

OUTCOMES:
The students will have knowledge on the basics of physics related to properties of matter, optics, acoustics etc., and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications.
TEXT BOOKS:

REFERENCE BOOKS:

GE8151 COMPUTING TECHNIQUES

OBJECTIVES:
The students should be made to:
- Learn the organization of a digital computer.
- Be exposed to the number systems.
- Learn to think logically and write pseudo code or draw flow charts for problems.
- Be exposed to the syntax of C.
- Be familiar with programming in C.
- Learn to use arrays, strings, functions, pointers, structures and unions in C.

UNIT I INTRODUCTION

UNIT II C PROGRAMMING BASICS
UNIT III  ARRAYS AND STRINGS  9

UNIT IV  FUNCTIONS AND POINTERS  9

UNIT V  STRUCTURES AND UNIONS  9
Introduction – Need for structure data type – structure definition – Structure declaration – Structure within a structure - Union - Programs using structures and Unions – Storage class- es, Pre-processor directives.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
• Design C Programs for problems.
• Write and execute C programs for simple applications

TEXTBOOKS:

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

Concepts and conventions (Not for Examination)
Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES AND FREE HAND SKETCHING
Basic Geometrical constructions, Curves used in engineering practices

Visualization concepts and Free Hand sketching: Visualization principles – Representation of Three Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of objects

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES
Orthographic projection- principles-Principal planes-First angle projection-Projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and trapezoidal method and traces Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS
Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method.

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES
Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes
UNIT V  ISOMETRIC AND PERSPECTIVE PROJECTIONS

Principles of isometric projection – isometric scale – Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method and vanishing point method.

COMPUTER AIDED DRAFTING (DEMONSTRATION ONLY)  3

Introduction to drafting packages and demonstration of their use.

TOTAL: 75 PERIODS

OUTCOMES:
On Completion of the course the student 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.

TEXT BOOK:

REFERENCES:
Publication of Bureau of Indian Standards:

Special points applicable to University Examinations on Engineering Graphics:
1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. The examination will be conducted in appropriate sessions on the same day

PH8161
PHYSICS LABORATORY
(common to all branches of B.E./B.Tech. Programmes)

OBJECTIVES:
To introduce different experiments to test basic understanding of physics concepts applied in optics, thermal physics and properties of matter.

1. Torsional pendulum – Determination of rigidity modulus of wire and moment of inertia of disc
2. Non – uniform bending – Determination of young’s modulus
3. Lee’s disc – Determination of thermal conductivity of a bad
4. Potentiometer – Determination of thermo e.m.f. of thermocouple
5. Air wedge – Determination of thickness of a thin sheet of paper
6. i. Optical fibre – Determination of Numerical Aperture and acceptance
   ii. Compact disc – Determination of width of the groove using laser
7. Acoustic grating – Determination of velocity of ultrasonic waves in
8. Post office box – Determination of Band gap of a semiconductor
9. Spectrometer – Determination of wavelength using grating
10. Viscosity of liquids – Determination of co-efficient of viscosity of a liquid by Poiseuille’s flow

**TOTAL: 30 PERIODS**

**OUTCOMES:**
The hands on exercises undergone by the students will help them to apply physics principles of optics and thermal physics to evaluate engineering properties of materials.

**CY8161 CHEMISTRY LABORATORY L T P C**
(Common to all branches of Engineering and Technology) 0 0 2 1

**OBJECTIVES:**
- To make the student to acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis.
- To acquaint the students with the determination of molecular weight of a polymer by vacometry.

1. Estimation of HCl using Na\textsubscript{2}CO\textsubscript{3} as primary standard and Determination of alkalinity in water sample.
2. Determination of total, temporary & permanent hardness of water by EDTA method.
3. Determination of DO content of water sample by Winkler’s method.
4. Determination of chloride content of water sample by argentometric method.
5. Estimation of copper content of the given solution by Iodometry.
6. Determination of strength of given hydrochloric acid using pH meter.
7. Determination of strength of acids in a mixture of acids using conductivity meter.
8. Estimation of iron content of the given solution using potentiometer.
9. Estimation of iron content of the water sample using spectrophotometer (1,10-phenanthroline / thiocyanate method).
10. Estimation of sodium and potassium present in water using flame photometer.
14. Determination of CMC.
15. Phase change in a solid.

**TOTAL: 30 PERIODS**
OUTCOMES:
The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.

REFERENCES:

GE8161 COMPUTER PRACTICES LABORATORY

OBJECTIVES:
The student should be made to:
- Be familiar with the use of Office software.
- Be exposed to presentation and visualization tools.
- Be exposed to problem solving techniques and flow charts.
- Be familiar with programming in C.
- Learn to use Arrays, strings, functions, structures and unions.

LIST OF EXPERIMENTS:
1. Search, generate, manipulate data using MS office/ Open Office
2. Presentation and Visualization – graphs, charts, 2D, 3D
3. Problem formulation, Problem Solving and Flowcharts
4. C Programming using Simple statements and expressions
5. Scientific problem solving using decision making and looping.
6. Simple programming for one dimensional and two dimensional arrays.
7. Solving problems using String functions
8. Programs with user defined functions
9. Program using Recursive Function and conversion from given program to flow chart.
10. Program using structures and unions.

OUTCOMES:
At the end of the course, the student should be able to:
- Apply good programming design methods for program development.
- Design and implement C programs for simple applications.
- Develop recursive programs.
OBJECTIVES:
To provide exposure to the students with hands-on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

GROUP – A (CIVIL & ELECTRICAL)

1. CIVIL ENGINEERING PRACTICE

Plumbing
- Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.
- Laying pipe connection to the suction side of a pump – inlet.
- Laying pipe connection to the delivery side of a pump – outlet.
- Practice in mixed pipe connections: Metal, plastic and flexible pipes used in household appliances.

Wood Work
- Sawing, planning and making common joints: T-Joint, Mortise and Tenon joint, Dovetail joint.

STUDY
- Study of joints in door panels, wooden furniture
- Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICE

- Basic household wiring using switches, fuse, indicator – lamp etc.,
- Preparation of wiring diagrams
- Stair case light wiring
- Tube – light wiring
- Study of iron-box, fan with regulator, emergency lamp

GROUP – B (MECHANICAL AND ELECTRONICS)

3. MECHANICAL ENGINEERING
PRACTICE Welding
- Arc welding of butt joints, lap joints, tee joints
- Gas welding Practice.
- Basic Machining
- Simple turning, drilling and tapping operations.
- Machine assembly Practice.
- Study and assembling the following:
  - Centrifugal pump, mixies and air conditioners.
  - Demonstration on
    (a) Smithy operations like the production of hexagonal bolt.
    (b) Foundry operation like mould preparation for grooved pulley.

4. ELECTRONIC ENGINEERING PRACTICE
- Soldering simple electronic circuits and checking continuity.
- Assembling electronic components on a small PCB and testing.
- Study of Telephone, FM radio, low-voltage power supplies.

TOTAL: 45 PERIODS

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.

HS8251 TECHNICAL ENGLISH II
(For all branches of B.E / B.Tech programmes)

OBJECTIVES
- To make the students acquire listening and speaking skills meant for both formal and informal contexts
- To help them develop their reading skills by exposing them to different types of reading strategies
- To equip them with writing skills needed for academic as well as workplace situations
- To make them acquire language skills at their own pace by using e-materials and language lab component
UNIT I
Listening - Listening to informal conversations and participating; Speaking - Opening a conversation (greetings, comments on something, weather) - Turn taking - Closing a conversation (excuses, general wish, positive comment, thanks); Reading - Developing analytical skills, Deductive and inductive reasoning - Extensive reading; Writing - Effective use of SMS for sending short notes and messages - Using ‘emoticons’ as symbols in email messages; Grammar - Regular & irregular verbs - Active and passive voice; Vocabulary - Homonyms (e.g. ‘can’) - Homophones (e.g. ‘some’, ‘sum’); E-materials - Interactive exercise on Grammar and vocabulary – blogging; Language Lab - Listening to different types of conversation and answering questions.

UNIT II
Listening - Listening to situation based dialogues; Speaking - Conversation practice in real life situations, asking for directions (using polite expressions), giving directions (using imperative sentences), Purchasing goods from a shop, Discussing various aspects of a film (they have already seen) or a book (they have already read); Reading - Reading a short story or an article from newspaper, Critical reading, Comprehension skills; Writing - Writing a review / summary of a story / article, Personal letter (Inviting your friend to a function, congratulating someone for his success, thanking one’s friend / relatives); Grammar - modal verbs, Purpose expressions; Vocabulary - Phrasal verbs and their meanings, Using phrasal verbs in sentences; E-materials - Interactive exercise on Grammar and vocabulary, Extensive reading activity (reading stories / novels from links), Posting reviews in blogs - Language Lab - Dialogues (Fill up exercises), Recording students’ dialogues.

UNIT III
Listening - Listening to the conversation - Understanding the structure of conversations; Speaking - Conversation skills with a sense of stress, intonation, pronunciation and meaning - Seeking information – expressing feelings (affection, anger, regret etc.); Reading - Speed reading – reading passages with the time limit - Skimming; Writing - Minutes of meeting – format and practice in the preparation of minutes - Writing summary after reading the articles from the journals - Format for the journal articles – elements of technical articles (abstract, introduction, methodology, results, discussion, conclusion, appendices, references) - Writing strategies; Grammar - Conditional clauses - Cause and effect expressions; Vocabulary - Words used as nouns and verbs without any change in the spelling (e.g. ‘rock’, ‘train’, ‘ring’); E-materials - Interactive exercise on Grammar & vocabulary - Speed Reading practice exercises; Language Lab - Intonation practice using EFLU materials – Attending a meeting and writing minutes.
UNIT IV

Listening - Listening to a telephone conversation, Viewing a model interview (face-to-face, telephonic and video conferencing) and observing the practices; Speaking - Role play practice in telephone skills - listening and responding, -asking questions, -note taking – passing on messages, Role play and mock interview for grasping the interview skills; Reading - Reading the job advertisements and the profile of the company concerned – scanning; Writing - Applying for a job – cover letter - résumé preparation – vision, mission and goals of the candidate; Grammar - Numerical expressions - Connectives (discourse markers); Vocabulary - Idioms and their meanings – using idioms in sentences; E-materials - Interactive exercises on Grammar & Vocabulary - Different forms of résumés- Filling up a résumé / cover letter; Language Lab - Telephonic interview – recording the responses - e-résumé writing.

UNIT V

Listening - Viewing a model group discussion and reviewing the performance of each participant - Identifying the characteristics of a good listener; Speaking - Group discussion skills - initiating the discussion – exchanging suggestions and proposals – expressing dissent/ agreement – assertiveness in expressing opinions – mind mapping technique; Reading - Note making skills – making notes from books, or any form of written materials - Intensive reading Writing - Types of reports – Feasibility / Project report – report format – recommendations / suggestions – interpretation of data (using charts for effective presentation); Grammar - Use of clauses; Vocabulary – Collocation; E-materials - Interactive grammar and vocabulary exercises - Sample GD - Pictures for discussion, Interactive grammar and vocabulary exercises - Pictures for discussion; Language Lab - Different models of group discussion

TOTAL : 60PERIODS

OUTCOMES:
Learners should be able to:

- Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative strategies.
- Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
- Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
- Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.

TEXT BOOKS:
REFERENCES:

EXTENSIVE READERS

WEB RESOURCES
1. www.esl-lab.com
2. www.englishgrammar.org
3. www.englishclub.com
4. www.mindtools.com
5. www.esl.about.com
OBJECTIVES:

• To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.
• To acquaint the student with the concepts of vector calculus, needed for problems in all engineering disciplines.
• To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current.
• To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated

UNIT I DIFFERENTIAL EQUATIONS 9+3
Method of variation of parameters – Method of undetermined coefficients – Homogenous equation of Euler’s and Legendre’s type – System of simultaneous linear differential equations with constant coefficients.

UNIT II VECTOR CALCULUS 9+3
Gradient and directional derivative – Divergence and Curl – Irrotational and Solenoidal vector fields – Line integral over a plane curve – Surface integral and volume integral - Green’s, Gauss divergence and Stoke’s theorems – Verification and application in evaluating line, surface and volume integrals.

UNIT III ANALYTIC FUNCTION 9+3
Analytic functions – Necessary and sufficient conditions for analyticity - Properties – Harmonic conjugates – Construction of analytic function - Conformal mapping – Mapping by functions \( w = z + c \), \( az \), \( 1/Z \), \( Z^2 \) + - Bilinear transformation.

UNIT IV COMPLEX INTEGRATION 9+3
UNIT V  LAPLACE TRANSFORMS  9+3


TOTAL : 60 PERIODS

OUTCOMES:
The subject helps the students to develop the fundamentals and basic concepts in vector calculus, ODE, Laplace transform and complex functions. Students will be able to solve problems related to engineering applications by using these techniques.

TEXT BOOKS:

REFERENCES:

PH8253  PHYSICS FOR INFORMATION SCIENCE  L T P C
(Common to Computer Science and Information Technology Branches)  3 0 0 3

OBJECTIVE:
To understand the essential principles of Physics of semiconductor device and Electron transport properties. Become proficient in magnetic and optical properties of materials and Nano electronic devices.
UNIT I  ELECTRICAL PROPERTIES OF MATERIALS  
Electrical conduction – Classification of conducting materials – Free electron theory - 
Expression for electrical conductivity – Thermal conductivity, expression - Wiedemann-Franz law – Ohm’s law – Classical free electron theory (advantages and drawbacks) - 
Quantum free electron theory – Schrodinger wave equation – Applications of 
Schrodinger wave equation (Particle in infinite potential well, Particle in a box, Reflection 
and transmission of electron waves) – degenerate states – Fermi- Dirac statistics – 
Electron effective mass.

UNIT II  SEMICONDUCTORS AND TRANSPORT PHYSICS  
Intrinsic Semiconductors – Energy band diagram – direct and indirect band gap 
semiconductors – Carrier concentration in intrinsic semiconductors – extrinsic 
semiconductors - Carrier concentration in N-type & P-type semiconductors – Variation of 
carrier concentration with temperature – Carrier transport in Semiconductors: Drift, 
mobility and diffusion – Hall effect and devices – Ohmic contacts – Schottky diode.

UNIT III  MAGNETIC PROPERTIES OF MATERIALS  
Classification of magnetic materials – Quantum numbers – Magnetic moment – Classical 
theory of diamagnetism (Langevin theory) – Theory of paramagnetism – 
Ferromagnetism (Weiss theory) – Anti ferromagnetic materials – Ferrites – Hard soft 
magnetic materials – Magnetic recording materials – Bubble memory – Magnetic 
principle in computer data storage – Magnetic tape – Floppy disc – Magnetic hard disc.

UNIT IV  OPTICAL PROPERTIES OF MATERIALS  
Classification of optical materials – Absorption in metals, insulators & Semiconductors - 
LED’s – Organic LED’s – Polymer light emitting materials – Plasma light emitting devices 
– LCD’s – Laser diodes – Optical data storage techniques (including DVD, Blue -ray 
disc, Holographic data storage).

UNIT V  NANO DEVICES  
The density of state for solids – Electron density in a conductor – Significance 
between Fermi energy and Volume of the material – Quantum confinement – 
Quantum structures – Metal-to-insulator transition – Confining excitons – Band gap of 
nanomaterials – Tunneling – Resonant Tunneling Diodes (RTD’s) – Single electron 
phenomena – Single electron Transistor – Quantum cellular automata (QCA) – Carbon 
nanotubes – Molecular electronic structures – Spintronics.

TOTAL: 45 PERIODS
OUTCOMES:
At the end of the course the students will be able to

- Understand the electrical, magnetic and optical properties of semiconductor materials
- Understand the concepts and applications of semiconductor devices

TEXT BOOKS:

REFERENCES:

CS8201 DIGITAL PRINCIPLES AND SYSTEM DESIGN L T P C 3 0 0 3

OBJECTIVES:
- To familiarize basic and advanced operations of boolean algebra
- To learn the designing of combinational and sequential circuits from Boolean functions
- To analyse the logic design using hardware description languages
- To know the application of logic design in advanced digital circuits like RAM and ROM

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 9

UNIT II COMBINATIONAL LOGIC 9

UNIT III SYNCHRONOUS SEQUENTIAL LOGIC 9
UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC


UNIT V MEMORY AND PROGRAMMABLE LOGIC


TOTAL: 45 PERIODS

OUTCOMES:
- To reduce simple Boolean functions using K-Maps
- To reduce complex Boolean functions using Tabulation method
- To transform logic circuits using universal logic gates
- To convert between digital codes using encoder/decoder
- To compile batch of digital operations using multiplexer/demultiplexer
- To design counting logic circuits using shift registers/digital counters
- To reduce state tables and state transition tables in asynchronous logic design
- To demonstrate error detection and error correction using digital circuits

TEXT BOOK:

REFERENCES:
OBJECTIVE:
- To know the evolution of computers
- To understand the basics of computer operations
- To differentiate between various streams of programming
- To understand the functions of operating systems
- To learn the basics of database management systems
- To learn the basics of computer networks

UNIT I INTRODUCTION 9

UNIT II SOFTWARE & HARDWARE 9

UNIT III OPERATING SYSTEMS 9

UNIT IV DATABASE MANAGEMENT 9

UNIT V NETWORKS 9

TOTAL: 45 PERIODS
OUTCOMES:
- To exercise the algorithmic / pseudocode approach to program design
- To appreciate the use of compiler and interpreter
- To identify the difference between the operations of MS-DOS, WINDOWS and UNIX
- To be able to write queries in database languages
- To explain the network topology within department / institute laboratories

TEXT BOOKS:

REFERENCE:

CS8203 PROGRAMMING USING C++ L T P C 3 0 0 3

OBJECTIVES:
- To develop programming skills from OO perspective
- To get introduced to handling pointer operations in combination with Object-orientation
- To learn to handle exceptions in OO operations
- To learn advanced file handling and stream operations

UNIT I POINTERS AND FILE HANDLING IN C 9
Introduction to Pointers – Pointers and arrays – Pointers and structures – Pointers to functions – Applications of pointers – File Handling – Case study.

UNIT II INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING 9
Introduction – Procedure vs. object oriented programming – Data types – control structures – Arrays and Strings – User defined types – Functions and Pointers – Case study
UNIT III   OBJECT ORIENTED PROGRAMMING CONCEPTS   9
Classes and Objects – Operator Overloading – Inheritance – Polymorphism and Virtual Functions – Case study

UNIT IV   TEMPLATES AND EXCEPTION HANDLING   9
Function templates and class templates – Name spaces – Casting – Exception Handling – Case study.

UNIT V   FILES AND ADVANCED FEATURES   9

TOTAL: 45 PERIODS

OUTCOMES:
- To write programs using pointers in combination with arrays, structures and functions
- To be able to convert a procedure-oriented program into object-oriented program
- To write OO programs using overloading
- To write programs that handle exceptions
- To write programs using dynamic memory allocation

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
The student should be made to:
- Understand the various logic gates.
- Be familiar with various combinational circuits.
- Understand the various components used in the design of digital computers.
- Be exposed to sequential circuits
- Learn to use HDL

LIST OF EXPERIMENTS:
1. Verification of Boolean Theorems using basic gates.
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters.
3. Design and implementation of combinational circuits using MSI devices:
   - 4–bit binary adder / subtractor
   - Parity generator / checker
   - Magnitude Comparator
   - Application using multiplexers
4. Design and implementation of sequential circuits:
   - Shift–registers
   - Synchronous and asynchronous counters
5. Coding combinational / sequential circuits using HDL.
6. Design and implementation of a simple digital system (Mini Project).

TOTAL: 45 PERIODS

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS HARDWARE
1. Digital trainer kits 30
2. Digital ICs required for the experiments in sufficient numbers

SOFTWARE
1. HDL simulator.
OUTCOMES:
At the end of this course, the student will be able to:
- Use boolean simplification techniques to design a combinational hardware circuit.
- Design and Implement combinational and sequential circuits.
- Analyze a given digital circuit – combinational and sequential.
- Design the different functional units in a digital computer system.
- Design and Implement a simple digital system

CS8212 PROGRAMMING LABORATORY

OBJECTIVES:
The student should be made to:
- Understand the use of Functions, Pointers and Files in C.
- Understand the Object Oriented Programming concepts of C++
- Analyze the use of advanced Object Oriented features in an application.

LIST OF EXPERIMENTS:
1. Programs using Functions and Pointers in C
2. Programs using Files in C
3. Programs using Classes and Objects
4. Programs using Operator Overloading
5. Programs using Inheritance, Polymorphism and its types
6. Programs using Arrays and Pointers
7. Programs using Dynamic memory allocation
8. Programs using Templates and Exceptions
9. Programs using Sequential and Random access files

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
- 30 Terminals with C and C++ Compiler

TOTAL: 45 PERIODS

OUTCOMES:
At the end of this course, the student will be able to:
- Write programs using Functions and Pointers in C.
- Design applications using Object Oriented Concepts
- Design Programs that use advanced concepts of C++
- Write Programs using Templates and Files using C++
- Critically analyze the use of C and C++ programming languages for different types of applications
OBJECTIVES:
- To introduce the basic notions of groups, rings, fields which will then be used to solve related problems.
- To examine the key questions in the Theory of Numbers.
- To give an integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.

UNIT I  FIELDS  9+3
Group Theory - Rings and Polynomials – Fields.

UNIT II  FINITE FIELDS AND POLYNOMIALS  9+3
Finite Fields – Irreducible Polynomials over Finite fields – Factorization of Polynomials over Finite Fields.

UNIT III  DIVISIBILITY THEORY AND CANONICAL DECOMPOSITIONS  9+3

UNIT IV  DIOPHANTINE EQUATIONS AND CONGRUENCES  7+3
Linear Diophantine equations – Congruence’s – Linear Congruence’s - Applications: Divisibility tests – Modular Designs – Chinese remainder theorem – 2x2 linear systems.

UNIT V  CLASSICAL THEOREMS AND MULTIPLICATIVE FUNCTIONS  10+4

TOTAL: 60 PERIODS

OUTCOMES:
At the end of the course the student is able to:
- Solve problems related to finite fields and Polynomials
- Understand the applications of division and Euclidean Algorithm
- Understand the classical theorems and multiplicative functions

TEXT BOOKS:
REFERENCES:

GE8351 ENVIRONMENTAL SCIENCE AND ENGINEERING

OBJECTIVES:
To the study of nature and the facts about environment.
- To find and implement scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
- To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
- To study the dynamic processes and understand the features of the earth’s interior and surface.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.
Field study of common plants, insects, birds
Field study of simple ecosystems – pond, river, hill slopes, etc.
UNIT II   ENVIRONMENTAL POLLUTION

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards– soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.
Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III   NATURAL RESOURCES

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

UNIT IV   SOCIAL ISSUES AND THE ENVIRONMENT


UNIT-V   HUMAN POPULATION AND THE ENVIRONMENT


TOTAL: 45 PERIODS
OUTCOMES:
Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.

- Public awareness of environment at infant stage.
- Ignorance and incomplete knowledge has lead to misconceptions.
- Development and improvement in standard of living has lead to serious environmental disasters.

TEXT BOOKS:

REFERENCE BOOKS:

CS8301 COMPUTER ARCHITECTURE L T P C 3 1 0 4

OBJECTIVES:
- To learn the fundamentals of computer architecture
- To know the concepts behind parallelism and pipelining
- To learn advanced concepts in Instruction level parallelism
- To get introduced to binary arithmetic
- To learn about virtual memory, associative memory and memory management

UNIT I FUNDAMENTALS OF A COMPUTER SYSTEM 9+3
UNIT II BASIC PROCESSING UNIT


UNIT III ADVANCED CONCEPTS IN ILP AND CURRENT TRENDS


UNIT IV ARITHMETIC FOR COMPUTERS


UNIT V MEMORY AND I/O


OUTCOMES:

- To identify the functional units in a digital computer system
- To distinguish between the various ISA styles
- To trace the execution sequence of an instruction through the processor
- To compare different approaches used for implementing a functional unit
- To write programs involving interrupt handling

TEXT BOOK:

REFERENCES:


CS8302 DATA STRUCTURES L T P C

OBJECTIVES:
- To learn program independent view of data structures
- To know the data structure representation and various operations performed on them
- To learn algorithms for sorting, searching and indexing

UNIT I LINEAR DATA STRUCTURES
Abstract Data Types - Asymptotic Notations: Big-Oh, Omega and Theta – Best, Worst and Average case Analysis: Definition and an example – Arrays and its representations – Stacks and Queues – Linked lists – Linked list based implementation of Stacks and Queues – Evaluation of Expressions – Linked list based polynomial addition.

UNIT II NON-LINEAR DATA STRUCTURES

UNIT III SEARCH STRUCTURES AND PRIORITY QUEUES
AVL Trees – Red-Black Trees – Splay Trees – Binary Heap – Leftist Heap

UNIT IV SORTING
UNIT V  SEARCHING AND INDEXING
Linear Search – Binary Search - Hash tables – Overflow handling – Cylinder Surface Indexing – Hash Index – B-Tree Indexing.

TOTAL : 45 PERIODS

OUTCOMES:
- To analyse the programs and express their time complexity
- To write programs using linear and non-linear data structures
- To write programs for sorting, searching and indexing

TEXT BOOKS:

REFERENCES:

CS8303  DATABASE MANAGEMENT SYSTEMS LTPC 3003

OBJECTIVES:
- To learn the fundamentals and issues in database systems
- To appreciate the design of databases using relational models
- To learn data definition and query languages
- To understand the importance of transaction management in databases
- To emphasize the need for sorting and indexing in databases
- To learn advanced representations of databases suited for real-time applications

UNIT I  INTRODUCTION TO DATABASE SYSTEMS
Data - Database Applications - Evolution of DB & DBMS - Need for data management – Data models & Database Architecture - Professions in DBMS - Key issues and challenges in Database Systems

UNIT II  ER AND RELATIONAL MODELS
UNIT III  DATA DEFINITION AND QUERYING  8
Basic DDL - Introduction to SQL - Data Constraints - Triggers - Database Security –
Advanced SQL - Embedded & Dynamic SQL - Views

UNIT IV  TRANSACTIONS AND CONCURRENCY  10
Introduction to Transactions - Transaction Systems - ACID Properties - System & Media
Recovery - Two Phase Commit Protocol - Recovery with SQL - Need for Concurrency -
Locking Protocols - Deadlocks & Managing Deadlocks - SQL Support for Concurrency

UNIT V  ADVANCED TOPICS IN DATABASES  9
Indexing & Hashing Techniques - Query Processing & Optimization - Sorting & Joins –
Database tuning - Introduction to Special Topics - Spatial & Temporal Databases - Data
Mining & Warehousing - Data Visualisation - Mobile Databases - OODB & XML
Databases - Multimedia & Web Databases.

TOTAL : 45 PERIODS

OUTCOMES:
- To classify modern and futuristic database applications based on size and complexity
- To design a database from understanding an Universe of Discourse, using ER
diagrams
- To be able to map ER model with Relational model
- To write queries using normalization criteria
- To create a physical database from a design using DDL
- To compare and contrast various indexing strategies in different database systems
- To critique how advanced databases differ from traditional databases.

TEXT BOOKS:
   Sixth Edition, Pearson / Addison - Wesley, 2010
   Hill, 2002.

EC8303 ELECTRONIC DEVICES AND CIRCUITS FOR COMPUTER ENGINEERS  3 0 0 3

OBJECTIVE:
To know theorems and techniques to analyze electric circuits, electronic devices and
their characteristics, important power supply designs, and design of amplifiers,
oscillators and opamp circuits.
UNIT I  VOLTAGE AND CURRENT LAWS
Nodes, Paths, Loops, and Branches; Kirchoff’s Current Law, Kirchoff’s Voltage Law, Single Loop Circuit, Single Node-Pair Circuit, Series and Parallel Connected Independent Sources, Resistors in Series and Parallel, Voltage and Current Division

UNIT II  CIRCUIT ANALYSIS TECHNIQUES
Linearity and Superposition, Sources Transformation, Thevinin and Norton Equivalent Circuits, Maximum Power Transfer, Delta-Wye Conversion, Single Phase and 3 Phase Circuits-Power Factor-Power-Concept of Phasor Diagrams.

UNIT III  SEMICONDUCTOR DEVICES

UNIT IV  RECTIFIERS, AMPLIFIERS AND OSCILLATORS
FWR-Filter-Capacitance Input Filter-Choke Input Filter – CE Amplification with and without feedback – Analysis and Frequency Response – CS MOSFET Amplifier – Analysis

UNIT V  OPERATION AMPLIFIER

OUTCOMES:
- The students are familiarized in electric circuits, machines, transformers; know basic of mathematical models of electrical systems.
- The students can analyze transfer function and state variables and also perform sophisticated analysis on real time physical systems.

TEXT BOOKS:
2. Robert T.Paynter Introductory Electronic Devices and Circuits – Pearson
REFERENCES:

CS8311 DATA STRUCTURES LABORATORY L T P C
0 0 3 2

OBJECTIVES:
The student should be made to:
- Understand array based and link list based implementations of stack and queue
- Learn the use of list, stacks and queues for different types of applications
- Understand different operations of trees and graphs
- Be exposed to searching and sorting algorithms

1. Array based implementation of stack and queue.
2. Linked list implementations and problems related to linked list such as inverting list, concatenation, etc.
3. Linked list based implementation of stack and queue
4. Evaluation of expressions
5. Binary tree traversals
6. Graph traversals
7. Merge sort
8. Quick sort
9. Binary search
10. Binary Heap
11. AVL tree implementation
12. Hash Tables

TOTAL: 45 PERIODS

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
30 Systems with C++ Compiler.

OUTCOMES:
At the end of this course, the student will be able to:
- Compare and contrast Array based and Link based applications of typical data structures such as Stacks and Queues
- Design applications and justify use of specific linear data structures for these applications
- Implement binary tree and graph operations
- Compare and contrast different search algorithms

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OBJECTIVES:
The student should be made to:
- Understand data definitions and data manipulation commands
- Learn about the use of nested and joint queries
- Understand functions, procedures and procedural extensions of data bases
- Be familiar with the use of a front end tool
- Understand design and implementation of typical data base applications

LIST OF EXPERIMENTS:
1. Data Definition Commands.
2. Data Manipulation Commands.
3. DML Command to perform Nested and Join Queries.
4. Views – Creation and Manipulation.
5. Cursors and Triggers.
7. Functions and Procedures.
8. Forms and Menu design using a Front End Tool.
9. Simple application development.
11. Data base connectivity techniques.
12. Design and implementation of a Database Application.

OUTCOMES:
At the end of this course, the student will be able to:
- Use typical data definitions and manipulation commands.
- Design applications to test Nested and Joint Queries
- Implement simple applications that uses Views
- Implement applications that require a Front End Tool and Report Generations
- Critically analyze the use of Tables, Views, functions and Procedures for a realistic database application.

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS:
Softwares:
Oracle
Server
Visual Basic
OBJECTIVES:
• To provide the required fundamental concepts in probability and queueing models and apply these techniques in networks, image processing etc.
• Acquire skills in analyzing queueing models.

UNIT I  RANDOM VARIABLES  9+3
Discrete and Continuous random variables – Moments – Moment generating functions – Binominal, Poisson, Geometric, Uniform, Exponential, Gamma, Weibull and Normal distributions - Functions of a random variable.

UNIT II  TWO-DIMENSIONAL RANDOM VARIABLES  9+3
Joint distributions – Marginal and Conditional distributions – Covariance – Correlation and Linear regression – Transformation of random variables – Central limit theorem (for independent and identically distributed random variables).

UNIT III  RANDOM PROCESSES  9+3

UNIT IV  QUEUEING THEORY  9+3
Markovian queues – Birth and Death processes – Single and multiple server queueing models – Little’s formula - Queues with finite waiting rooms – Finite source models.

UNIT V  NON-MARKOVIAN QUEUES AND QUEUEING NETWORKS  9+3
M/G/1 queue – Pollaczek Khinchin formula - M/D/1 and M/E /1 as special cases – Series queues – Open and closed Jackson networks.

TOTAL: 60 PERIODS

OUTCOMES:
• The students will have a fundamental knowledge of the probability concepts.
• Acquire skills in analyzing queueing models.
• It also helps to understand and characterize phenomenon which evolve with respect to time in a probabilistic manner.

TEXT BOOKS:
REFERENCES:

CS8401 DESIGN AND ANALYSIS OF ALGORITHMS L T P C 3 0 2 4

OBJECTIVES:
- To understand various algorithm design techniques, and to know how to apply those techniques to real-time problems
- To learn to design parallel algorithms
- To learn concepts of dynamic programming
- To get introduced to NP-class of problems and their approximate solutions.

UNIT I ANALYSIS & DIVIDE-AND-CONQUER 9

Lab Component: 6
Implementing some recursive algorithms and study its theoretical time vs empirical time – Implement and analyze selection problem.

UNIT II GREEDY & DYNAMIC PROGRAMMING 9

Lab Component: 6
Implement and analyze: Minimum spanning tree problem and Traveling salesperson problem.

UNIT III BACKTRACKING & BRANCH-AND-BOUND 9
Lab Component: 6
Implement and analyze: Sum of subsets – Implement Branch and Bound based traveling salesperson problem and compare with dynamic programming.

UNIT IV STRING MATCHING & PARALLEL ALGORITHMS 9

Lab Component: 6
Implement and compare simple string matching and KMP algorithms. Implement prefix computation algorithm by using multiple threads or processes.

UNIT V NP PROBLEMS & APPROXIMATION ALGORITHMS 9

Lab Component: 6
Implement vertex cover and traveling salesman problems using approximation algorithm.

TOTAL: 45 + 30 : 75 PERIODS

OUTCOMES:
• To implement recursive algorithms and study the time complexity
• To implement and analyse: Minimum spanning tree problem and Traveling salesperson problem.
• To implement programs using Branch and Bound technique
• To implement and compare simple string matching and KMP algorithms.
• To write programs for prefix computation using multiple threads or processes.
• To implement vertex cover and traveling salesman problems using approximation algorithm

TEXT BOOKS:

REFERENCES:
OBJECTIVES:

- To comprehend the concepts of core java and working principles of Internet
- To learn client-server programming and web development
- To learn concepts related to web application development

UNIT I  JAVA FUNDAMENTALS  12
Overview of Java, Fundamental Programming Structures, Strings – Objects
Classes and Methods - Inheritance - Packages and Interfaces - Exception handling,
Collections - Multithreading – Java I/O Streams, File Handling.

UNIT II  INTERNET BASICS AND JAVA NETWORK
PROGRAMMING  12
Internet Addressing, Browsers, Servers, Protocols – Web Application Architectures,
Development – Scripting Languages – Databases – Search Engines – Web Services –
Collective Intelligence – Mobile Web – Features of Web 3.0
Overview of Java Networking - TCP - UDP - InetAddress and Ports - Socket
Programming- Working with URLs - Internet Protocols simulation - HTTP - SMTP - POP
- FTP - Remote Method Invocation.

UNIT III  CLIENT-SIDE PROGRAMMING  12
Scripting for content structuring, form design, client side validation, dynamic page
generation, adding interactivity, styles, using HTML, DHTML, XHTML, CSS, Java Script –
XML - Document Type Definition - XML Schema - Document Object Model - Presenting
XML - Using XML Parsers: DOM and SAX - Evolution of AJAX JQuery - Web
applications with AJAX - AJAX JQuery Framework - AJAX with PHP - AJAX with
Databases – Java Applets – JQuery - Swing

UNIT IV  SERVER-SIDE PROGRAMMING  12
Types of servers - Configuring and Using Web servers, Setting up Databases, Java
Database Connectivity -Handling form data, validation, querying databases,
information retrieval, response generation, Session management - using PHP, Servlets,
JSP.

UNIT V  WEB APPLICATION DEVELOPMENT  12
Creating Interactive Websites - Search engines – cookies - Blogs - Social web
applications - developing WIKI pages – Programming for the Mobile web.

TOTAL: 60 PERIODS
OUTCOMES:
- To write java programs using inheritance and exception handling
- To write programs using socket programming
- To write programs for client-side and server-side programming
- To create interactive web-sites and social web applications

TEXT BOOKS:

REFERENCES:

CS8451 OPERATING SYSTEMS L T P C 3 0 0 3

OBJECTIVES:
- To learn the components and operations of operating systems
- To get an idea about process synchronization
- To learn concepts behind inter-process communication
- To learn disk scheduling and process scheduling
- To understand deadlock handling and memory management

UNIT I OPERATING SYSTEMS OVERVIEW 9
UNIT II  PROCESS MANAGEMENT  

UNIT III  STORAGE MANAGEMENT  

UNIT IV  I/O SYSTEMS  

UNIT V  CASE STUDY  

TOTAL: 45 PERIODS

OUTCOMES:
- To write programs using multi-threading
- To solve problems related to process scheduling and disk scheduling
- To use synchronization concepts in real-time programs
- To apply banker’s algorithm for solving problems in deadlocks
- To solve problems related to paging and segmentation
- To implement OS concepts in Linux

TEXT BOOK:

REFERENCES:
OBJECTIVES:

- To provide an overview of software engineering
- To emphasize on following CMM
- To learn detailed concepts related to software engineering life cycle
- To understand the concepts of verification and validation
- To appreciate the necessity of assessing software quality and measurements

UNIT I  SOFTWARE PROCESS MODELS  9

UNIT II  REQUIREMENT ENGINEERING  9

UNIT III  ANALYSIS MODELLING  9

UNIT IV  DESIGN & TESTING  9
UNIT V  QUALITY & MAINTENANCE

TOTAL: 45 PERIODS

OUTCOMES:
• To differentiate the perspective of various software process models
• To elicit the requirements for real-time problems
• To compile a SRS pertaining to industry standards
• To create a behavioral model from the set of requirements
• To develop a user-interface design for the given system
• To outline various software metrics and their context in measuring software programs
• To estimate the software cost

TEXT BOOKS:

REFERENCES:

EE8407 ELECTRICAL ENGINEERING AND CONTROL SYSTEMS

OBJECTIVE
To impart knowledge on Network analysis, principle of electrical machines, different system representation, block diagram reduction and Mason’s rule, time response and frequency response analysis of LTI systems, and State variable analysis.

UNIT I ELECTRIC CIRCUITS
Dependent and independent sources - Kirchhoff’s laws - mesh current and node voltage methods - theorems - Thevenin’s - Norton’s - superposition - maximum power transfer- (DC Analysis only) Phasors - sinusoidal steady state response of simple RLC circuits.
UNIT II DC MACHINES
Construction of DC machines - Theory of operation of DC generators – Characteristics of DC generators- Operating principle of DC motors - Types of DC motors and their characteristics - Speed control of DC motors- Applications.

UNIT III AC MACHINES

UNIT IV MATHEMATICAL MODELS OF PHYSICAL SYSTEMS
Definition & classification of system - terminology & structure of feedback control theory - Differential equation of physical systems - Block diagram algebra - Signal flow graphs.

UNIT V TRANSFER FUNCTION and STATE VARIABLE ANALYSIS
Time Response analysis of II order system -Frequency response - Bode plots – Concept of state variable - State models for linear & continuous time systems.

TOTAL: 45 PERIODS

OUTCOME:
- The students are familiarized in electric circuits, machines, transformers;
- know basic of mathematical models of electrical systems.
- The students can analyze transfer function and state variables and also
- perform sophisticated analysis on real time physical systems.

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
The student should be made to:

- Understand Object Oriented features of Java.
- Learn about Socket programming and RMI in Java
- Understand Client side scripting and Server side programming
- Learn about Web application development in Java

LIST OF EXPERIMENTS:
1. Java classes and objects
2. Inheritance, Polymorphism
3. Interfaces and Exception Handling, Packages
4. Using InetAddress class
5. Socket Programming in Java
6. RMI
7. Client side scripting using
   - XHTML
   - Javascript/DOM
   - CSS
8. XML DTD, Parsers, XSLT
9. Programming with AJAX, JQuery
10. Java Applets, AWT, Swings
11. Server Side programming (implement these modules using any of the server side scripting languages like PHP, Servlets, JSP etc.,
   - Gathering form data
   - Querying the database
   - Response generation
   - Session management
12. MySQL/JDBC/Oracle
13. Application development
14. Develop applications using Dreamweaver/Flex/Silver Light etc.,

TOTAL: 45 PERIODS
OUTCOMES:
At the end of this course, the student will be able to:
- Implement programs using the Object Oriented features of Java
- Implement socket programming and Client side scripting in Java
- Design a Web application using Java Applets, AWT and Swings
- Develop application using Dreamweaver/Flex/Silver Light etc. including use of database connectivity

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS:
Software:
1. Browser
2. JDK version 6 update 27
3. TOMCAT 7.0
4. MySQL 5.5,
5. Oracle 11i
6. Dreamweaver CS5.5
7. NetBeans IDE 7
8. XAMPP / WAMP

CS8461 OPERATING SYSTEMS LABORATORY

OBJECTIVES:
The student should be made to:
- Learn shell programming and the use of filters in the UNIX environment.
- Be exposed to programming in C using system calls.
- Learn to use the file system related system calls.
- Be exposed to process creation and inter process communication.
- Be familiar with implementation of CPU Scheduling Algorithms, page replacement algorithms and Deadlock avoidance

LIST OF EXPERIMENTS:
1. Learn the use of basic UNIX commands.
2. Shell Programming.
3. Grep, sed, awk.
4. File system related system calls. (Learn to create, open, read, write, seek into, close files; open, read, write, search, close directories)
5. Process management – Fork, Exec (Learn to create a new process and to overlay an executable binary image on an existing process)
6. Inter-process communication between related processes using pipes.
7. Process synchronization using semaphores (Solutions to synchronization problems like producer consumer problem, dining philosophers’ problem etc...)
8. Inter-process communication between unrelated processes using Shared memory
9. Inter-process communication between unrelated processes using Message Queues

TOTAL: 45 PERIODS
OUTCOMES:
At the end of the course, the student should be able to
• Implement deadlock avoidance, and Detection Algorithms
• Compare the performance of various CPU Scheduling Algorithm
• Critically analyze the performance of the various page replacement algorithms
• Create processes and implement IPC

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
1. Linux server
2. Terminals for 30 students

Outcomes:
The students will be able to
• Write Shell programming in the UNIX environment.
• Create programs using System calls in C.
• Use the file system related system calls.
• Create process and their communication.
• Develop process synchronization using semaphores.

CS8501 DATA COMMUNICATION AND COMPUTER NETWORKS L T P C 3 1 0 4

OBJECTIVES:
• To appreciate the top-down and bottom-up view of computer network architecture
• To know the functionality of each layer in computer networks
• To get introduced to various protocols at every layer
• To learn concepts related to network addressing
• To learn the use of hardware in data communication

UNIT I APPLICATION LAYER 9+3

UNIT II TRANSPORT LAYER 11+3
UNIT III NETWORK LAYER 11+3

UNIT IV DATA LINK LAYER 7+3

UNIT V DATA COMMUNICATIONS 7+3

TOTAL: 45+15 PERIODS

OUTCOMES:
- To write programs for data communication in application layer
- To differentiate between the functional view of TCP and UDP
- To evaluate the protocols in network layer from QoS perspective
- To outline the protocols and topologies in data link layer
- To identify the use of various transmission media

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
- To understand the functional blocks of a microprocessor
- To learn 8085 / 8086 programming
- To be able to build a microprocessor / microcontroller based system for a given application

UNIT I  THE 8085 MICROPROCESSOR
Introduction to 8085 – Microprocessor architecture – Instruction set – Programming the 8085.

UNIT II  8086 SOFTWARE ASPECTS

UNIT III  8086 SYSTEM DESIGN
8086 signals – Basic configurations – System bus timing – System design using 8086 – Multiprocessor configurations – Coprocessor, Closely coupled and loosely coupled configurations – Introduction to advanced processors.

UNIT IV  I/O INTERFACING

UNIT V  MICROCONTROLLERS

TOTAL: 45 PERIODS

OUTCOMES:
- To write programs for 8085 / 8086
- To write programs involving interrupt handling
- To explain the architecture and concepts behind 8051 and its operations

TEXT BOOKS:

REFERENCES:

CS8503 SYSTEM SOFTWARE INTERNALS L T P C 3 0 0 3

OBJECTIVES:

- To understand the issues related to design and implementation of assemblers
- To learn the role of linkers and loaders
- To understand the working of macro processors
- To get introduced to virtual machines
- To learn about code optimization

UNIT I ASSEMBLERS 12


UNIT II LOADERS AND LINKERS 8

UNIT III  MACROPROCESSORS AND EMULATORS


UNIT IV  VIRTUAL MACHINES


UNIT V  ADVANCED FEATURES


OUTCOMES:

- To write assembly level programs
- To analyse loaders and linkers
- To explain macro processor design
- To describe the structure and architecture of virtual machines
- To outline the benefits and issues related to data and process migration in grids

TOTAL : 45 PERIODS

TEXT BOOKS:


REFERENCES:

OBJECTIVES:
- To learn about automata, grammar, language and their relationships
- To understand the power of Turing machine and the decidable nature of a problem

UNIT I  REGULAR LANGUAGES  10

UNIT II  CONTEXT FREE LANGUAGES  10
Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Equivalence of Parse trees and derivation - Normal forms for CFG - Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG – Pumping lemma for CFL.

UNIT III  CLOSURE PROPERTIES AND TURING MACHINES  8

UNIT IV  UNDECIDABILITY  8
A language that is not Recursively Enumerable (RE) – An undecidable problem that is RE – Undecidable problems about Turing Machine – Rice theorem for Recursive and Recursively enumerable languages – Post’s Correspondence Problem.

UNIT V  RECENT TRENDS & APPLICATIONS  9

TOTAL : 45 PERIODS
OUTCOMES:
- To differentiate DFA and NFA
- To solve problems in DFA and NFA
- To solve problems in CFG
- To explain the undecidable nature of a given problem
- To apply TOC to real-world problems.

TEXT BOOKS:

REFERENCES:

CS8551 OBJECT ORIENTED ANALYSIS AND DESIGN L T P C
3 0 0 3

OBJECTIVES:
- To understand the fundamentals of objects and their modeling
- To differentiate unified process from other approaches
- To emphasize on modeling based software design
- To familiarize with the modeling languages
- To reinforce software design with design patterns

UNIT I OOAD BASICS 10
UNIT II REQUIREMENTS & MORE MODELING


UNIT III DESIGN AND PRINCIPLES OF DESIGN


UNIT IV MAPPING TO CODE

Mapping designs to code – Test Driven development and refactoring – UML Tools and UML as blueprint.

UNIT V MORE PATTERNS


TOTAL : 45 PERIODS

OUTCOMES:

• To express software design with UML diagrams
• To analyse the communication of software modules using interaction diagrams
• To identify and map basic software requirements in UML modeling
• To be capable of transforming UML based software design into pattern based design framework using design patterns
• To explain the purpose of applying particular design pattern to a specific module
• To outline and analyse the areas of design pattern correspondence with code

TEXT BOOKS:


REFERENCES:

OBJECTIVES:
• To enhance the employability skills of students with a special focus on Presentation skills, Group discussion skills and Interview skills
• To help them improve their soft skills, including report writing, necessary for the workplace situations
2. Creating effective PPTs – presenting the visuals effectively
3. Using appropriate body language in professional contexts – gestures, facial expressions, etc.
4. Preparing job applications - writing covering letter and résumé
5. Applying for jobs online - email etiquette
6. Participating in group discussions – understanding group dynamics - brainstorming the topic
7. Training in soft skills - persuasive skills – People skills - questioning and clarifying skills – mock GD
8. Writing Project proposals – collecting, analyzing and interpreting data / drafting the final report
9. Attending job interviews – answering questions confidently
10. Interview etiquette – dress code – body language – mock interview

TOTAL: 30 PERIODS

REQUIREMENTS FOR A CLASS OF 30 STUDENTS
1. A PC or a lap top with one or two speakers
2. A Collar mike and a speaker
3. An LCD projector and a screen
4. CD’s and DVD’s on relevant topics

OUTCOMES:
At the end of the course, learners should be able to
• Take international examination such as IELTS and TOEFL
• Make presentations and Participate in Group Discussions.
• Successfully answer questions in interviews.
REFERENCE BOOKS:

EXTENSIVE READERS

WEB RESOURCES
1. www.humanresources.about.com
2. www.careerride.com

CS8511 CASE TOOLS LABORATORY L T P C

OBJECTIVES:
The student should be made to:
- Learn the basics of OO analysis and design skills.
- Be exposed to the UML design diagrams.
- Learn to map design to code.
- Be familiar with the various testing techniques

LIST OF EXPERIMENTS:
1. Study of case tools such as rational rose or equivalent tools
2. Requirements
   - Implementation of requirements engineering activities such as elicitation, validation, management using case tools
3. Analysis and design
   - Implementation of analysis and design using case tools.
4. Study and usage of software project management tools such as cost estimates and scheduling
5. Documentation generators - Study and practice of Documentation generators.
6. Data modeling using automated tools.
7. Practice reverse engineering and re-engineering using tools.
8. Exposure towards test plan generators, test case generators, test coverage and software metrics.
9. Meta modeling and software life cycle management.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to
- Design and implement projects using OO concepts.
- Use the UML analysis and design diagrams.
- Apply appropriate design patterns.
- Create code from design.
- Compare and contrast various testing techniques

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
1. Case tools such as rational rose or equivalent tools. (30 user license).
2. Any Project management tools such as JxProject (freeware).
3. 1 server + 32 PCs (P4 or higher version with at least 2 GB RAM).

CS8512  COMMUNICATIONS AND NETWORKS LABORATORY   L T P C 0 0 3 2

OBJECTIVES:
The student should be made to:
- Understand the use of TCP and UDP Sockets.
- Create about different Algorithms
- Be exposed to the use of simulation tool for performing Component of TCP / UDP Routing protocols.

LIST OF EXPERIMENTS:
1. Simple Chat Program using TCP Sockets
2. Simulation of HTTP Protocol using TCP Sockets
3. Simulation of DNS using UDP Sockets
4. Learn to use commands like TCP Dump, Netstat, Trace Route
5. Simulation of Ping using Raw Sockets
6. Simulation of Distance Vector/ Link State Routing algorithm
7. Study and configure functionalities of a router and switches (or by simulation)
8. Study of TCP/UDP performance using Simulation tool
9. Performance comparison of Routing protocols using Simulation tool
10. Simulation of error correction code (like CRC)

TOTAL: 45 PERIODS

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
1. Linux Server - 1
2. Terminals for 30 students

OUTCOMES:
At the end of this course, the student will be able to:
• Implement Chat Program and HTTP Protocol using TCP Sockets
• Compare and Contrast different routing algorithms
• Configure functionalities of router and switches
• Compare performance of routing protocols using simulation tools

CS8513 MICROPROCESSORS LABORATORY

OBJECTIVES:
The student should be made to:
• Introduce ALP concepts and features
• Write ALP for arithmetic and logical operations in 8086 and 8051
• Differentiate Serial and Parallel Interface
• Interface different I/Os with Microprocessors
• Be familiar with MASM

LIST OF EXPERIMENTS:
1. Simple programming exercises on 8085 (Like 8-bit multiplication, division).
2. Code conversion, decimal arithmetic and Matrix operations.
3. Floating point operations, string manipulations, sorting and searching.
4. Simple programming with 8086 with basic system calls for input/output (Arithmetic operations).
5. String manipulation - search, find and replace, copy operations, sorting and searching.
6. File manipulations with system calls.
8. Interfacing with 8085/8086 – 8279 and 8251.
9. Microprocessor based system development.
10. Application development using Micro controller.
OUTCOMES:

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

- Write ALP Programmes for fixed and Floating Point and Arithmetic
- Interface different I/Os with processor
- Generate waveforms using Microprocessors
- Execute Programs in 8051
- Explain the difference between simulator and Emulator

LABORATORY REQUIREMENTS FOR BATCH OF 30

STUDENTS HARDWARE

1. 8085 trainer kits 30
2. 8086 trainer kits 30
3. Interface cards like stepper motor interface, traffic light controller, ADC / DAC
4. 8051 trainer kits 30

SOFTWARE

1. 8086 assembler.
2. Simulator for HDL.

CS8601 ARTIFICIAL INTELLIGENCE L T P C 3 0 0 3

OBJECTIVES:

- To understand the role of intelligent agents
- To learn uninformed and informed search strategies
- To understand the concepts behind constraint satisfaction
- To learn to represent knowledge effectively using propositional logic and predicate logic
- To learn various reasoning paradigms
- To understand the role of reasoning in machine learning
UNIT I  INTRODUCTION

UNIT II  PROBLEM SOLVING METHODS

UNIT III  KNOWLEDGE REPRESENTATION

UNIT IV  MACHINE LEARNING

UNIT V  APPLICATIONS

TOTAL: 45 PERIODS

OUTCOMES:
- To differentiate between various intelligent agents
- To solve problems involving informed and uninformed search strategies
- To represent natural language sentences using predicate logic and propositional logic
- To differentiate supervised learning from unsupervised learning
- To identify real world applications of AI
TEXT BOOKS:

REFERENCES:

CS8602 COMPILER DESIGN L T P C
3 0 2 4

OBJECTIVES:
- To learn concepts of lexical analysis and parsing
- To understand the intermediate code and object code generation
- To know the importance of code optimization
- To learn about compiler parallelism

UNIT I FRONT END OF COMPILERS 9+6
The structure of Compiler – Lexical analysis: Role of Lexical analyzer, Specification and recognition of tokens, Syntax Analysis: Top down parsing, Bottom up parsing, LR Parsers: SLR, CLR, and LALR.
Lab Component: Lexical analyzer generators, Parser generators

UNIT II INTERMEDIATE CODE GENERATION 9+6
Syntax Directed Definitions, Evaluation orders for syntax directed definitions, Syntax Directed Translation schemes, Intermediate languages: Three address code, Syntax tree, Postfix code – Declarations – Type checking – Expression translation – Back patching
**Lab Component:** Intermediate code generation of Expressions, Assignment statements with arrays, Control flow statements, Switch statements.

**UNIT III**  
**OBJECT CODE GENERATION**  
9+6  

**Lab Component:** Code generation for any specific architecture supported by open source compilers

**UNIT IV**  
**CODE OPTIMIZATION**  
9+6  
Basic blocks and Flow graphs – Optimization of basic blocks – Principal sources of optimizations- Data flow analysis – Constant propagation – Partial redundancy elimination - Peephole optimizations.

**Lab Component:** Exploring and customizing different types of optimizations supported by any open source compiler

**UNIT V**  
**PARALLELIZING COMPILER**  
9+6  
Basic concepts and examples – Iteration spaces – Affine array indexes – Data reuse – Array data dependence - Finding synchronization free parallelism –Synchronization between parallel loops, Locality optimizations.

**Case study:** Open source parallelizing compilers.

**TOTAL: 45 + 30 PERIODS**

**OUTCOMES:**

- To design the front end of compiler
- To write programs for lexical analysis and parsing
- To explain concepts related to intermediate code generation related in open-source compilers
- To explore various types of code optimizations of open-source compilers
- To explain the concepts of compiler parallelization using open-source compilers

**TEXT BOOK:**

REFERENCES:

CS8603 COMPUTER GRAPHICS AND MULTIMEDIA

OBJECTIVES:
- To learn the fundamentals of graphics and multimedia
- To know the concepts of 2D and 3D graphics programming
- To acquire skills related to multimedia compression and animation
- To learn to handle multimedia objects

UNIT I 2D PRIMITIVES

UNIT II 2D GEOMETRIC TRANSFORMATIONS

UNIT III 3D CONCEPTS
Projections - Three dimensional object representation – Parallel and Perspective Polygons, Splines, Quadric Surfaces - Visualization of data sets - 3D affine transformations 3D Rotations using Quaternions – Viewing – Visible surface identification – Color Models, 3D Transformations in open GL
UNIT IV  MULTIMEDIA BASICS
Introduction and definitions – applications – elements – Animations – Compression –
Types of Compressions: Lossless – Lossy – Video compression – Image Compression –

UNIT V  MULTIMEDIA AUTHORING AND APPLICATIONS
Creating interactive multimedia – Multimedia Authoring Systems – Multimedia Authoring
Software Applications – Video On demand – Virtual Reality – Augmented Reality –
Content based retrieval in digital libraries.

OUTCOMES:
- To develop, design and implement two and three dimensional graphical structures
- To differentiate lossy and lossless compressions
- To develop programming assignments related to animation
- To create interactive multimedia

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE BOOKS:
   2003.
   2007.

CS8604  PROGRAMMING PARADIGMS  L T P C
OBJECTIVES:
- To explore modern programming languages and the techniques used for programming
- To get an idea on evaluation of programming languages
- To analyse a given program from good programming practice perspective
UNIT I  INTRODUCTION 9

UNIT II  SEMANTICS 9

UNIT III  FUNCTIONS 9

UNIT IV  PROGRAMMING TECHNIQUES 9

UNIT V  MODERN PROGRAMMING TECHNIQUES 9

TOTAL: 45 PERIODS

OUTCOMES:
- To write programs related to syntax and semantics
- To compare programs between C, Ada, Perl and Small Talk
- To write programs using scripting languages
- To demonstrate event-driven and concurrent programming using prolog
- To apply prolog for developing distributed systems

TEXT BOOKS:

REFERENCES:
OBJECTIVES:

- To get an idea on designing analog and digital filters
- To acquire the knowledge related to error detection and correction
- To introduce discrete Fourier transform and its applications.
- To teach the design of infinite and finite impulse response filters for filtering undesired signals.
- To introduce signal processing concepts in systems having more than one sampling frequency.

UNIT I  SIGNALS AND SYSTEMS  9

UNIT II  FREQUENCY TRANSFORMATIONS  9

UNIT III  IIR FILTER DESIGN  9
Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (LPF, HPF, BPF, BRF) filter design using frequency translation

UNIT IV  FIR FILTER DESIGN  9

UNIT V  APPLICATIONS  9

TOTAL: 45 PERIODS
OUTCOMES:
• To perform frequency transforms for signals
• To design IIR and FIR filters
• To write programs using analog and digital filters and to compare the respective output
• To identify finite word length errors in digital filters
• To develop applications related to image processing and speech processing

TEXT BOOKS:

REFERENCES:

CS8611 COMPUTER GRAPHICS AND MULTIMEDIA LABORATORY L T P C 0 0 3 2

OBJECTIVES:
• To make the students understand graphics programming
• To create 3D graphical scenes using open graphics library suits
• To perform image manipulation, enhancement
• To create animations
• To create a multimedia presentation/Game/Project

IMPLEMENT THE EXERCISES FROM 1 TO 4 USING C / OPENGL / JAVA
1. Implementation of Algorithms for drawing 2D Primitives – Line (DDA, Bresenham) – all slopes
   Circle (Midpoint)
2. 2D Geometric transformations
   – Translation
   Rotation
Scaling
Reflectio
n Shear
Window-Viewport
3. Composite 2D Transformations
4. Liang - Barsky Line Clipping

**Implement the exercises from 5 to 7 using OpenGL**
5. 3D Transformations - Translation, Rotation, Scaling
6. 3D Projections – Parallel, Perspective
7. Creating 3D Scenes
8. Compression Algorithms - To implement text and image compression algorithms.
9. Image Editing and Manipulation - Basic Operations on image using any image editing software, Creating gif animated images, Image optimization
10. 2D Animation – To create Interactive animation using any authoring tool

**TOTAL: 45 PERIODS**

**OUTCOMES:**
**At the end of the course, the student should be able to**
- Create 3D graphical scenes using open graphics library suits
- Implement image manipulation and enhancement
- Create 2D animations using tools

**CS8612 CREATIVE AND INNOVATIVE PROJECT**

The goal of this course is to encourage the students to identify innovative projects that help in exploring variables that promote creativity and innovation. Each student is expected to choose a real life or socially relevant problem. At the end of the project, students should be familiar with the state of art in their respective fields. They would be able to apply the concepts learnt to relevant research problems or practical applications.

The goal of this course is to motivate them to learn concepts, models, frameworks, and tools that engineering graduates’ need in a world where creativity and innovation is fast becoming a pre-condition for competitive advantage.

**TOTAL: 45 PERIODS**
AIM:
To learn the different principles and techniques of management in planning, organizing, directing and controlling.

OBJECTIVES
• To study the Evolution of Management
• To study the functions and principles of management
• To learn the application of the principles in an organization

UNIT I INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS 9

UNIT II PLANNING 9

UNIT III ORGANISING 9

UNIT IV DIRECTING 9

UNIT V CONTROLLING 9
System and process of controlling – budgetary and non-budgetary control techniques – use of computers and IT in Management control – Productivity problems and management – control and performance – direct and preventive control – reporting.

TOTAL: 45 PERIODS
OUTCOMES:
- Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management

TEXT BOOKS:

REFERENCES:

CS8701 MOBILE AND PERVERSIVE COMPUTING L T P C 3 0 0 3

OBJECTIVES:
- To study the details of lower layers of mobile architectures
- To learn to develop applications for various mobile OS
- To learn the concepts and protocols behind wireless networks

UNIT I PERVERSIVE COMPUTING 9
Basics and vision – Architecture and Applications requirements – Smart devices and operating systems , secure services – Smart mobiles, cards and device networks.

UNIT II MOBILE APPLICATIONS 9

UNIT III MEDIUM ACCESS AND TELECOMMUNICATIONS 9
UNIT IV  WIRELESS NETWORKS

UNIT V  MOBILE NETWORK AND TRANSPORT LAYERS
Mobile IP – DHCP – Routing in Mobile ad hoc networks – TCP improvements – TCP over 2.5/3G.

OUTCOMES:

- To explain the features of smart mobiles and other smart devices
- To develop applications for Android and iOS
- To explain protocols related to routing in mobile networks

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
- To understand various parallel programming models and challenges involved
- To learn the basics of OpenMP and MPI programming

UNIT I  FUNDAMENTALS OF PARALLEL COMPUTING

UNIT II  CHALLENGES OF PARALLEL PROGRAMMING

UNIT III  SHARED MEMORY MODELS AND OPENMP PROGRAMMING

UNIT IV  MPI PROGRAMMING

UNIT V  PROGRAMMING HETEROGENEOUS PROCESSORS

OUTCOMES:
- To identify the scope for parallelism in programs
- To explain the concepts behind parallel programming
- To write programs in Open MP
- To compare OpenMP and MPI

TEXT BOOKS:
REFERENCES:

6. MPI Programmer’s Manual

CS8703 SECURITY IN COMPUTING L T P C 3 0 0 3

OBJECTIVES:

- To understand the basics of cryptography
- To learn to find the vulnerabilities in programs
- To know the different kinds of security threats in networks, databases and their solutions
- To learn about models and standards of security

UNIT I ELEMENTARY CRYPTOGRAPHY


UNIT II PROGRAM SECURITY


UNIT III SECURITY IN NETWORKS

UNIT IV  SECURITY IN DATABASES

UNIT V  SECURITY MODELS AND STANDARDS

OUTCOMES:
- To write programs on public key encryption
- To differentiate malicious and non-malicious code
- To list and explain various type of threats in networks
- To write secured transactions in databases
- To explain various standards related to security models

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
The student should be made to:
- Understand the basics of Mobile application development
- Be exposed to launching services in a mobile phone and launching Web Portal
- Familiar with application using android and iPhone SDK framework

LIST OF EXPERIMENTS:
1. General Form Design
2. Mobile browser based interactive applications
3. Applications using controls
4. Mobile networking applications (SMS/Email)
5. Applications involving data retrieval
6. Launching services in a mobile phone
7. Web portal development
8. Applications using Android SDK framework (like interactive applications, applications that make use of accelerometer sensor, video applications)
9. Applications that use the iPhone SDK framework
10. Testing the applications using emulators

TOTAL: 45 PERIODS

OUTCOMES:
At the end of this course, the student will be able to:
- Design Mobile Networking application using basic facilities
- Launch services on Mobile Phone that involves data retrieval
- Design and development a Web Portal
- Compare and Contrast Android SDK and i Phone Frame Works for different types of application and testing these applications using Emulators

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
1. JDK environment
2. J2ME
3. Sun Java Wireless Toolkit
4. Android SDK
5. iPhone SDK
OBJECTIVES:
The student should be made to:

- Understand and apply software Engineering practices that are followed in Software Industries
- Develop a software package in any application.

Develop a software package in any application relevant to any area of study of your curriculum by applying the Software Engineering Practices generally done by software industries, which are

1. Identification of Use cases for each application system and SRS preparation.
2. Identification of reusable Components/Frameworks from open source and customizing them for each application.
3. Coding/Customizing/Wrapping for components/subsystems.
4. Testing – Scenario testing and test case preparation for each components/subsystems
5. Integration of subsystems and Testing
6. Simulation of datasets and load testing to analyze performance of the system.

TOTAL: 45 PERIODS

OUTCOMES:
At the end of this course, the student will be able to:

- Develop a software package in any application by following the procedural steps namely Identification, Coding, Testing, Integration and Simulation.

CS8001 .NET AND C# PROGRAMMING

OBJECTIVES:

- To understand the concept of .NET framework
- To study the different techniques of security
- To get introduced to web services with ASP.NET
- To explore window based applications
UNIT I  C# LANGUAGE BASICS
C# and the .NET framework - C# basics - Objects and types - Inheritance - Arrays - Operators and casts – Indexes

UNIT II  C# ADVANCED FEATURES
Delegates and events - Strings and regular expressions - Generics - Collections - Memory management and pointers - Errors and exceptions

UNIT III  BASE CLASS LIBRARIES AND DATA MANIPULATION
Tracing and events - Threading and synchronization - .Net security - Localization - Manipulating XML - Managing the file system - Basic network programming

UNIT IV  DATABASE AND WEB SERVICES
Window based applications - Data access with .NET - basics of ASP .NET - Introduction to web services

UNIT V  .NET FRAMEWORK
Architecture - Assemblies - Shared assemblies - CLR hosting - Appdomains - Reflection

TOTAL: 45 PERIODS

OUTCOMES:

- To write programs using basic and advanced features of C#
- To write programs for threading and synchronization
- To develop web based applications on .NET
- To explain the concepts related to reflection

TEXT BOOK:

REFERENCES:
OBJECTIVES:

- To study the protocols and the functionalities of ad hoc networks
- To understand the various applications developed based on ad hoc networking
- To know about the sensor networks
- To appreciate the challenges in establishing infrastructure for sensor networks and managing databases

UNIT I INTRODUCTION AND MAC PROTOCOLS


UNIT II ROUTING PROTOCOLS


UNIT III TRANSPORT Layer AND SECURITY ISSUES


UNIT IV SENSOR NETWORKS AND NETWORKING SENSORS


UNIT V INFRASTRUCTURE ESTABLISHMENT AND NETWORK DATABASE


OUTCOMES:

- To list the design issues in Ad-hoc networks
- To differentiate the working of various routing protocols
- To identify the challenges in sensor networks
- To outline issues related to synchronization and localization
- To evaluate the performance of protocols from QoS perspective

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:

CS8003 ADVANCED TOPICS ON DATABASES L T P C 3 0 0 3

OBJECTIVES:
- To know advanced concepts in databases in large scale analytics
- to learn concepts behind parallel, distributed, active, spatial, temporal and object databases
- to learn reasoning and query processing
- to understand the challenges in designing multimedia databases

UNIT I PARALLEL AND DISTRIBUTED DATABASES

UNIT II ACTIVE DATABASES

UNIT III TEMPORAL AND OBJECT DATABASES
UNIT IV  COMPLEX QUERIES AND REASONING

UNIT V  SPATIAL, TEXT AND MULTIMEDIA DATABASES

OUTCOMES:
• to write programs involving query optimization
• to write programs related to large scale data processing
• to use MapReduce in data analytics
• to evaluate the performance of temporal and spatial databases
• to write suitable indexing programs for multimedia databases

TOTAL: 45 PERIODS

REFERENCES:
3. VLDB Journal.

FURTHER READING:
• http://video.google.com
• http://www.blinkvid.com/video
• http://www.crazyengineers.com/forum

CS8004  BIO INFORMATICS TECHNOLOGIES  L T P C
3 0 0 3

OBJECTIVES:
• To understand basic concepts of molecular biology and genetics
• To learn the concepts of computer science that relate to problems in biological sciences
• To learn to use computer as a tool for biomedical research
• To get introduced to important functional relationships from gene data.
UNIT I  INTRODUCTION

Need for Bioinformatics technologies – Overview of Bioinformatics technologies
Structural bioinformatics – Data format and processing – Secondary resources and applications – Role of Structural bioinformatics - Biological Data Integration System.

UNIT II  DATAWAREHOUSING AND DATAMINING IN BIOINFORMATICS

Bioinformatics data – Data warehousing architecture – data quality – Biomedical data analysis – DNA data analysis – Protein data analysis – Machine learning – Neural network architecture and applications in bioinformatics

UNIT III  MODELING FOR BIOINFORMATICS


UNIT IV  PATTERN MATCHING AND VISUALIZATION


UNIT V  MICROARRAY ANALYSIS


OUTCOMES:

- To apply data warehousing and data mining concepts in bioinformatics
- To develop models for biological data
- To write programs using HMM for bioinformatics
- To write programs using pattern matching and visualization
- To apply microarray technology for genomic expression study

TEXT BOOKS:

REFERENCES:

CS8005 CLOUD COMPUTING AND SERVICES LTPC 3003

OBJECTIVES
- To understand the current trend and basics of cloud computing.
- To differentiate between various service types: software, platform and infrastructure
- To understand the collaboration of cloud services.
- To expose various ways to collaborate the cloud service online.
- To familiarize with technologies for cloud virtualization
- To learn the standards behind cloud services

UNIT I INTRODUCTION 9

UNIT II CLOUD SERVICES 9
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, Amazon, Microsoft Azure, IBM, Sales force.

UNIT III COLLABORATING USING CLOUD SERVICES 9

UNIT IV VIRTUALIZATION FOR CLOUD 9
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   9


OUTCOMES

• To be able to collaborate the cloud services to any device.
• To explore the online applications of cloud services.
• To implement cloud computing for the corporation.
• To design various applications by integrating the cloud services

TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCES:

2. Lee Badger, Tim Grance, Robert Patt-Corner, Jeff Voas, NIST, Draft cloud computing synopsis and recommendation, May 2011.
OBJECTIVES:

- To examine work at the frontiers of research in computing where ideas from biology are inspirations to build truly intelligent computer systems
- To analyse the dependencies among biology, complexity, computer science, informatics, cognitive science, robotics, and cybernetics
- To introduce concepts, models, algorithms, and tools for development of intelligent systems
- To create an understanding of the fundamental Computational Intelligence models
- To explore the theory and applications of two classes of system inspired by biology: neural networks and evolutionary computation
- To learn to apply Computational Intelligence techniques to classification, pattern recognition, prediction, rule extraction, and optimization problems.

UNIT I  THEORETICAL FOUNDATIONS  9


UNIT II  LEARNING  9


UNIT III  EVOLUTIONARY COMPUTING  9

Neural Networks – Back propagation Networks – Hopfield Neural Networks – Radial Basis Function Networks – Learning Vector Quantisation - Artificial Neural Networks

Fuzzy Classifiers – Fuzzy Cognitive Maps – Collective Intelligence - Swarm Intelligence – Ant routing – Adaptivity and self-organisation – quantitative emergence and control - Self- Organising Feature Maps

UNIT IV  ARTIFICIAL IMMUNE SYSTEMS  9

UNIT V ADVANCED TOPICS


TOTAL: 45 PERIODS

OUTCOMES:
- To write programs involving decision trees and clustering
- To write programs using machine learning
- To differentiate the operation of various type of neural networks
- To develop applications involving ACO and PSO

TEXT BOOKS:

REFERENCES:
OBJECTIVES:

- To evolve multidimensional intelligent model from a typical system
- To examine ways for representing multi-dimensional data for a data warehouse
- To discover the knowledge imbibed in the high dimensional system
- To study algorithms for finding the hidden interesting patterns in data
- To study the performance of various mining techniques on complex data objects.

UNIT I INTRODUCTION TO DATA WAREHOUSING

Evolution of Decision Support Systems- Data warehousing Components – Building a Data warehouse, Data Warehouse and DBMS, Data marts, Metadata, Multidimensional data model, OLAP vs OLTP, OLAP operations, Data cubes, Schemas for Multidimensional Database: Stars, Snowflakes and Fact constellations.

UNIT II DATA WAREHOUSE PROCESS AND ARCHITECTURE

Types of OLAP servers, 3–Tier data warehouse architecture, distributed and virtual data warehouses. Data warehouse implementation, tuning and testing of data warehouse. Data Staging (ETL) Design and Development, data warehouse visualization, Data Warehouse Deployment, Maintenance, Growth, Business Intelligence Overview- Data Warehousing and Business Intelligence Trends - Business Applications- tools-SAS

UNIT III INTRODUCTION TO DATA MINING

Data mining-KDD versus datamining, Stages of the Data Mining Process-task premitives, Data Mining Techniques - Data mining knowledge representation – Data mining query languages, Integration of a Data Mining System with a Data Warehouse – Issues, Data preprocessing – Data cleaning, Data transformation, Feature selection, Dimensionality reduction, Discretization and generating concept hierarchies-Mining frequent patterns- association-correlation

UNIT IV CLASSIFICATION AND CLUSTERING

Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods - Clustering techniques –, Partitioning methods- k-means- Hierarchical Methods - distance-based agglomerative and divisive clustering, Density-Based Methods – expectation maximization -Grid Based Methods – Model-Based Clustering Methods – Constraint – Based Cluster Analysis – Outlier Analysis
UNIT V DATA WAREHOUSING AND DATA MINING SOFTWARE’S AND APPLICATIONS

Mining complex data objects, Spatial databases, temporal databases, Multimedia databases, Time series and Sequence data; Text Mining –Graph mining-web mining- Application and trends in data mining

TOTAL: 45 PERIODS

OUTCOMES:
- To build a data warehouse for a real-world system
- To identify the necessity for database tuning in data warehouses
- To develop programs demonstrating dimensionality reduction
- To write programs for classification and clustering
- To develop applications related to web data mining

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
- To get the feel of basics of database tuning
- To learn concepts behind database design optimization
- To write procedures involving query planning

UNIT I  SQL TUNING

UNIT II  DESIGN OPTIMIZATION

UNIT III  PERFORMANCE TUNING

UNIT IV  TROUBLESHOOTING

UNIT V  CASE STUDIES
Monitoring and Tuning Activities – Benchmarking results of Oracle SQL* Forms – Oracle 11g – Informix.

OUTCOMES:
- To design databases involving normalization
- To write optimized code for accessing multiple databases
- To use tuning tools for different database operations
- To troubleshoot databases
- To use benchmark databases for demonstrating concepts behind database tuning

TOTAL: 45 PERIODS
TEXT BOOKS:

CS8009 E-LEARNING TECHNIQUES L T P C
3 0 0 3

OBJECTIVES:
- To learn the fundamentals of E-learning framework and lifecycle
- To know the potential uses of various learning management systems
- To familiarize the principles of E-learning
- To know the issues in designing interactive learning
- To appreciate the challenges and benefits of collaborative learning

UNIT I INTRODUCTION

UNIT II E-LEARNING STRATEGY

UNIT III PRINCIPLES OF E-LEARNING
Philosophy of E-Learning – theory of learning – Applying principles of multimedia - Applying principles of contiguity - Applying principles of modality - Applying principles of redundancy - Applying principles of coherency - Applying principles of personalization- web-based learning communities - knowledge sharing and Knowledge management in e-learning- social networks and social media in e-learning
UNIT IV DESIGN

On line E-Learning technologies – visual communication techniques- Computer-based technologies - Computer-mediated communication (CMC) - Assessment and evaluation- Organizing and designing learning sequences, Characteristics of Interactive Online Learning Media

UNIT V IMPLEMENTATION

Leverages example in E-Learning – collaborative E-Learning- Learner control in E-Learning- guidelines to solve issues in E-Learning – Implementation of an E-Learning Course Content for a complete online course, Research in content retrieval and generation for E-Learning, Role of cloud and semantic Grid in E-Learning

OUTCOMES:

- To analyze and compare different on-line E-Learning tools
- To design course content for a specific subject from different perspectives
- To plan and design the instruction and support level needs of learners of various backgrounds based on different learning methodologies
- To outline the various tasks of a typical online course facilitator
- To design and implement an E-Learning Course Content for a complete online course

TOTAL: 45 PERIODS

TEXT BOOKS:


REFERENCES:

4. Topics (Wiley Series on Parallel and Distributed Computing)
OBJECTIVES:
- To comprehend graphs as modeling and analysis tool
- To introduce various data structures with graph theory
- To learn fundamentals behind principle of counting and combinatorics

UNIT I  INTRODUCTION  9

UNIT II  TREES, CONNECTIVITY & PLANARITY  9

UNIT III  MATRICES, COLOURING AND DIRECTED GRAPH  8

UNIT IV  PERMUTATIONS & COMBINATIONS  9
Fundamental principles of counting - Permutations and combinations - Binomial theorem - combinations with repetition - Combinatorial numbers - Principle of inclusion and exclusion - Derangements - Arrangements with forbidden positions.

UNIT V  GENERATING FUNCTIONS  10
Generating functions - Partitions of integers - Exponential generating function - Summation operator - Recurrence relations - First order and second order – Non-homogeneous recurrence relations - Method of generating functions.

TOTAL: 45 PERIODS

OUTCOMES:
- To write programs involving basic graph algorithms
- To write programs for graph coloring
- To differentiate the potential use of directed and undirected graphs
- To outline the concepts of permutations and combinations

TEXT BOOKS:
REFERENCES:

CS8011 GREEN COMPUTING L T P C
3 0 0 3

OBJECTIVES:
- To acquire knowledge to adopt green computing practices to minimize negative impacts on the environment
- To learn about energy saving practices
- To understand the impact of e-waste and carbon waste

UNIT I FUNDAMENTALS

UNIT II GREEN ASSETS AND MODELING

UNIT III GRID FRAMEWORK

UNIT IV GREEN COMPLIANCE

UNIT V CASE STUDIES
The Environmentally Responsible Business Strategies (ERBS) – Case Study Scenarios for Trial Runs – Case Studies – Applying Green IT Strategies and Applications to a Home, Hospital, Packaging Industry and Telecom Sector.

TOTAL: 45 PERIODS
OUTCOMES:
- To explain the necessity of GreenIT
- To outline methodologies for creating Green Assets and their management
- To appreciate the use of Grid in GreenIT
- To develop case studies related to Environmentally Responsible Business Strategies

TEXT BOOKS:

REFERENCES:

CS8012 HUMAN COMPUTER INTERACTION

OBJECTIVES:
- To determine the necessity and use of computers
- To learn the methodologies for designing interactive systems
- To discover various models used for designing HCI systems

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

OUTCOMES:
• To evaluate the use of interactive systems
• To map software engineering principles with HCI system design
• To outline the methodologies for statistical analysis of HCI
• To design effective HCI for individuals and persons with disabilities
• To develop meaningful user interface

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCE:

OBJECTIVES:
- To learn the concepts behind IR
- To understand the operation of web search engines
- To learn the algorithms related to classification and clustering in Text Mining

UNIT I INTRODUCTION
Introduction - History of IR - Components of IR - Issues - Open source Search engine Frameworks, The impact of the web on IR - The role of artificial intelligence (AI) in IR – IR Versus Web Search - Components of a Search engine - Characterizing the web

UNIT II INFORMATION RETRIEVAL
Boolean and vector-space retrieval models - Term weighting - TF-IDF weighting - cosine similarity – Preprocessing - Inverted indices - efficient processing with sparse vectors – Language Model based IR - Probabilistic IR – Latent Semantic Indexing - Relevance feedback and query expansion

UNIT III WEB SEARCH ENGINE – INTRODUCTION AND CRAWLING
Web search overview, web structure, the user, paid placement, search engine optimization/ spam. Web size measurement - search engine optimization/spam – Web Search Architectures - crawling - meta-crawlers - Focused Crawling - web indexes — Near-duplicate detection - Index Compression - XML retrieval

UNIT IV WEB SEARCH – LINK ANALYSIS AND SPECIALIZED SEARCH
Link Analysis – hubs and authorities - PageRank and HITS algorithms - Searching and Ranking – Relevance Scoring and ranking for Web – Similarity - Hadoop & MapReduce - Evaluation - Personalized search - Collaborative filtering and content-based recommendation of documents and products – handling “invisible” Web - Snippet generation, Summarization, Question Answering, Cross-Lingual Retrieval

UNIT V DOCUMENT TEXT MINING
Information filtering; organization and relevance feedback – Text Mining - Text classification and clustering - Categorization algorithms: naive Bayes; decision trees; and nearest neighbor - Clustering algorithms: agglomerative clustering; k-means; expectation maximization (EM)

TOTAL: 45 PERIODS
OUTCOMES:
- To use an open source search engine framework and explore its capabilities
- To represent documents in different ways and discuss its effect on similarity calculations and on search
- To modify Page Rank and HITS
- To design and implement an innovative feature in a search engine
- To explain the search components affected by the innovation, design a smart information management system with Information Retrieval components

TEXT BOOKS:

REFERENCES:

CS8014 MIDDLEWARE TECHNOLOGIES

OBJECTIVES:
- To provide a sound knowledge in various middleware technologies
- To familiarize between various web service architectures and their standards

UNIT I INTRODUCTION
UNIT II    EJB and CORBA
EJB architecture - Overview of EJB software architecture, EJB Conversation, Building and Deploying EJBs, Roles, applications - EJB Session Beans, EJB entity beans - Lifecycle of Beans - EJB clients - developing an application - Deployment. CORBA – components - architectural features - method invocations - static and dynamic: IDL - CORBA’s self-describing data - interface repository - Building an application using CORBA - Overview of CORBA Services - Object location Services, Messaging Services - CORBA Component Model.

UNIT III   COM and .NET
Evolution of DCOM - Introduction to COM - COM clients and servers - COM IDL - COM Interfaces COM Threading Models – Marshalling - Custom and standard marshalling - Comparison COM and CORBA - Introduction to .NET - Overview of .NET architecture - Remoting.

UNIT IV    SOA and WEB SERVICES

UNIT V     OTHER TYPES OF MIDDLEWARE
Other types of Middleware, Real-Time Middleware, Embedded Systems Middleware, Mobile Middleware, Oracle Fusion Middleware

TOTAL: 45 PERIODS

OUTCOMES:
- To implement programs in EJB
- To map and differentiate the functions between COM and .NET
- To outline the functionalities of various types of middleware technologies
- To design web services

TEXT BOOKS:
REFERENCES:

CS8015 NANO COMPUTING L T P C 3 0 0 3

OBJECTIVES:
- To understand the basics of nano computing
- To appreciate the necessity of quantum computing
- To familiarize with quantum computing softwares

UNIT I NANO COMPUTING-PROSPECTS AND CHALLENGES 9

UNIT II NANO COMPUTING WITH IMPERFECTIONS 9
Introduction - Nanocomputing in the Presence of Defects and Faults - Defect Tolerance - Towards Quadrillion Transistor Logic Systems

UNIT III RELIABILITY OF NANOCOMPUTING 9
Markov Random Fields - Reliability Evaluation Strategies - NANOLAB - NANOPRISM - Reliable Manufacturing and Behavior from Law of Large Numbers

UNIT IV NANOSCALE QUANTUM COMPUTING 9
Quantum Computers - Hardware Challenges to Large Quantum Computers - Fabrication, Test, and Architectural Challenges - Quantum-dot Cellular Automata (QCA) - Computing with QCA - QCA Clocking - QCA Design Rules

UNIT V QCADESIGNER SOFTWARE AND QCA IMPLEMENTATION 9
Basic QCA Circuits using QCADesigner - QCA Implementation - Molecular and Optical Computing: Molecular Computing - Optimal Computing - Ultrafast Pulse Shaping and Tb/sec Data Speeds

TOTAL: 45 PERIODS
OUTCOMES:
- To list the challenges and issues in nano-computing research
- To identify the challenges in quantum computing
- To develop programs for QCA

TEXT BOOK:

REFERENCES:

CS8016 NATURAL LANGUAGE PROCESSING L T P C
3 0 0 3

OBJECTIVES:
- To learn the fundamentals of natural language processing
- To appreciate the use of CFG and PCFG in NLP
- To understand the role of semantic analysis

UNIT I INTRODUCTION

UNIT II MORPHOLOGY AND PART OF SPEECH TAGGING

UNIT III SYNTAX PARISING
Syntax Parsing - Grammar formalisms and treebanks - Parsing with Context Free Grammars- Features and Unification -Statistical parsing and probabilistic CFGs (PCFGs)-Lexicalized PCFGs.
UNIT IV  SEMANTIC ANALYSIS

UNIT V  APPLICATIONS
Named entity recognition and relation extraction- IE using sequence labeling-Machine Translation (MT) - Basic issues in MT-Statistical translation-word alignment- phrase-based translation – Question Answering

OUTCOMES:
• To tag a given text with basic Language processing features
• To design an innovative application using NLP components
• To implement a rule based system to tackle morphology/syntax of a language
• To design a tag set to be used for statistical processing for real-time applications
• To compare and contrast use of different statistical approaches for different types of NLP applications.

TEXT BOOKS:
2. Foundations of Statistical Natural Language Processing by Christopher D. Manning and Hinrich Schuetze, MIT Press, 1999
3. Steven Bird, Ewan Klein and Edward Loper Natural Language Processing with Python, O'Reilly Media; 1 edition, 2009

REFERENCES:
3. NLTK – Natural Language Tool Kit - http://www.nltk.org/
OBJECTIVES:

- To learn the network analysis and flow analysis with a network tool
- To understand the evaluation methodologies for Network analysis and Management

UNIT I  INTRODUCTION  9

UNIT II  ARCHITECTURE  9

UNIT III  NETWORK MANAGEMENT  9

UNIT IV  NETWORK MANAGEMENT ORGANIZATION  9

UNIT V  MANAGEMENT INTEGRATION  9

OUTCOMES:

- To use a network analysis tool to analyse a given network
- To use NMS for network management operations

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
- To appreciate the use of cryptography and digital signatures
- To learn the standards of encryption
- To learn various encryption algorithms
- To know the importance of network security
- To learn various types of network attacks

UNIT I  CLASSICAL CRYPTOSYSTEM  9

UNIT II  BLOCK CIPHER  9

UNIT III  MESSAGE AUTHENTICATION  9

UNIT IV  NETWORK SECURITY  9

UNIT V  WIRELESS NETWORK SECURITY  9

TOTAL: 45 PERIODS

OUTCOMES:
- To demonstrate the fundamentals of encryption using popular algorithms
- To compile security protocols and practices for wired and wireless networks
- To design a firewall
TEXT BOOKS:

REFERENCES:

CS8019  PRINCIPLES OF DISTRIBUTED SYSTEMS  L T P C  3 0 0 3
OBJECTIVES:
- To explain the goals and types of distributed systems
- To describe operation of distributed OS
- To emphasize the benefits of using distributed transactions
- To learn issues related to developing fault-tolerant systems

UNIT I  INTRODUCTION
Introduction to Distributed systems - challenges - architectural models - fundamental models - P2P systems - Introduction to interprocess communications - external data representation and marshalling- client server communication - group communication- multicast/pubsub - Energy Efficient Computing - Cloud computing

UNIT II  DISTRIBUTED OBJECTS AND FILE SYSTEM
Introduction - Communication between distributed objects - Remote procedure call - Events and notifications - Java RMI case Study - Introduction to DFS - File service architecture – Google file system - Introduction to Name Services- Name services and DNS - Directory and directory services-ClusterComputing-mapreduce/bigtable.
UNIT III DISTRIBUTED OPERATING SYSTEM SUPPORT
The operating system layer – Protection - Process and threads - Communication and invocation - Operating system architecture - Introduction to time and global states - Clocks, Events and Process states - Synchronizing physical clocks - Logical time and logical clocks - Global states - Distributed mutual exclusion - Overlay Networks - DHT

UNIT IV TRANSACTION AND CONCURRENCY CONTROL-DISTRIBUTED TRANSACTIONS
Transactions – Nested transaction – Locks - Optimistic concurrency control - Timestamp ordering- Comparison of methods for concurrency control - Introduction to distributed transactions- Flat and nested distributed transactions - Atomic commit protocols - Concurrency control in distributed transactions - Distributed deadlocks - Transaction recovery - Data- Intensive Computing and Map Reduce

UNIT V FAULT TOLERANCE, SECURITY AND REPLICATION

OUTCOMES:
• To implement distributed systems in the areas of system processes, communication applications, naming and synchronization
• To design distributed systems that take into account consistency, replication and/or fault tolerance
• To evaluate the security of distributed systems.

TEXT BOOKS:

TOTAL: 45 PERIODS
REFERENCES:

CS8020 PRINCIPLES OF EMBEDDED AND REAL TIME SYSTEMS L T P C
3 0 0 3

OBJECTIVES:
- To obtain a broad understanding of the technologies and applications of embedded and real-time systems
- To understand the architecture of embedded systems and real-time systems
- To have a basic knowledge on the various issues involved in real-time databases
- To know how embedded systems can be made more fault tolerant
- To learn about embedded/real-time operating systems and the various issues associated with them

UNIT I INTRODUCTION TO EMBEDDED SYSTEM ARCHITECTURE

UNIT II REAL-TIME SYSTEM AND TASKS

UNIT III REAL-TIME DATABASES AND COMMUNICATION
UNIT IV FAULT-TOLERANCE TECHNIQUES


UNIT V EMBEDDED/REAL-TIME OPERATING SYSTEMS


TOTAL: 45 PERIODS

OUTCOMES:
- To outline the ideas of real-time task scheduling
- To explain techniques of fault-tolerance
- To analyse the operations of real-time OS

TEXT BOOKS:

REFERENCES:
OBJECTIVES:

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

UNIT I  FUNDAMENTALS OF SOA

UNIT II  COMBINING SOA AND WEB SERVICES

UNIT III  MULTI CHANNEL ACCESS AND WEB SERVICES COMPOSITION

UNIT IV  JAVA WEB SERVICES
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-SOA support in .NET – ASP.NET web services – Case Studies- Web Services Enhancements (WSE)

UNIT V  WEB SERVICES SECURITY AND TRANSACTION

TOTAL: 45 PERIODS

OUTCOMES:

- To outline the concepts of SOA
- To develop a web service in Java
- To implement web security
TEXT BOOKS:

REFERENCES:

CS8022 SOFTWARE AGENTS L T P C 3 0 0 3

OBJECTIVES:
- To understand how software agents reduce information overhead
- To gain knowledge in use of software agents for cooperative learning and personal assistance
- To know how agent can communicate and share knowledge using agent communication language
- To gain knowledge in design of an agent interpreter and intelligent agent
- To understand the concept of mobile technology and mobile agents and its security

UNIT I AGENT AND USER EXPERIENCE
Agent characteristics- object Vs agent. Agent types- Interacting with Agents - Agent From Direct Manipulation to Delegation - Interface Agent, Metaphor with Character – Designing Agents – problem solving agent, rational agent. Direct Manipulation versus Agent Path to Predictable

UNIT II AGENTS FOR LEARNING AND ASSISTANCE
UNIT III AGENT COMMUNICATION AND COLLABORATION
Overview of Agent Oriented Programming - Agent Communication Language – KQML-Per formatives. Agent Based Framework of Interoperability. Virtual agents: agents in games and virtual environments; companion and coaching agents; modeling personality, emotions; multimodal interaction; verbal and non-verbal expressiveness.

UNIT IV AGENT ARCHITECTURE

UNIT V MOBILE AGENTS

OUTCOME:
- To develop a software agent for real-time application

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
OBJECTIVES:
- To understand the basics of software quality
- To learn various metrics of software quality
- To introduce concepts behind designing of test cases
- To learn the procedure of debugging a given software

UNIT I INTRODUCTION TO SOFTWARE QUALITY

UNIT II SOFTWARE QUALITY METRICS AND RELIABILITY

UNIT III TEST CASE DESIGN

UNIT IV TEST MANAGEMENT

UNIT V CONTROLLING AND MONITORING

OUTCOMES:
- To analyse software documentations using inspections and walkthrough
- To associate various software metrics to context
- To list the components of test plan
- To explain the principles behind SCM
TEXT BOOKS:

REFERENCES:

CS8024 SYSTEM MODELING AND SIMULATION

OBJECTIVES:
- To understand the concepts using natural models of computation
- To learn various mathematical models
- To learn to analyse simulation data
- To get introduced to various simulation tools

UNIT – I INTRODUCTION TO SIMULATION
Introduction – Simulation Terminologies- Application areas – Model Classification Types of Simulation- Steps in a Simulation study- Concepts in Discrete Event Simulation Example.

UNIT II MATHEMATICAL MODELS
UNIT III   ANALYSIS OF SIMULATION DATA

UNIT IV   VERIFICATION AND VALIDATION
Building – Verification of Simulation Models – Calibration and Validation of Models – Validation of Model Assumptions – Validating Input – Output Transformations.

UNIT V   SIMULATION OF COMPUTER SYSTEMS AND CASE STUDIES
Simulation Tools – Model Input – High level computer system simulation – CPU – Memory Simulation – Comparison of systems via simulation – Simulation Programming techniques - Development of Simulation models.

TOTAL: 45 PERIODS

OUTCOMES:
- To apply statistical models for simulation
- To compare various systems for simulation

TEXT BOOKS:

REFERENCES:

CS8071   CYBER FORENSICS   L T P C
3 0 0 3

OBJECTIVES:
- To understand Computer Forensics, Computing Investigations, Enforcement Agency Investigations, Corporate Investigations, forensically sound principles and practices related to digital evidence collection, management, and handling.
UNIT I TYPES OF COMPUTER FORENSICS

UNIT II DATA RECOVERY

UNIT III ELECTRONIC EVIDENCE

UNIT IV THREATS

UNIT V SURVEILLANCE

TOTAL: 45 PERIODS

OUTCOMES:
- To demonstrate data recovery from hardware
- To list various software threats
- To identify and explain the working of surveillance tools

TEXT BOOK:

REFERENCES:
OBJECTIVES:
- To get subsequent understanding of game design and development
- To learn the processes, mechanics, issues in game design
- To get exposed to the architecture of game programming
- To know about game engine development, modeling, techniques and frameworks
- To learn about 3D graphics principles and animation techniques

UNIT I  3D GRAPHICS FOR GAME PROGRAMMING  9
Coordinate Systems, Ray Tracing, Modeling in Game Production, Vertex Processing, Rasterization, Fragment Processing and Output Merging, Illumination and Shaders, Parametric Curves and Surfaces, Shader Models, Image Texturing, Bump Mapping, Advanced Texturing, Character Animation, Physics-based Simulation

UNIT II GAME DESIGN PRINCIPLES  9
Character development, Story Telling, Narration, Game Balancing, Core mechanics, Principles of level design, Genres of Games, Collision Detection, Game Logic, Game AI, Path Finding

UNIT III GAMING ENGINE DESIGN  9
Renderers, Software Rendering, Hardware Rendering, and Controller based animation, Spatial Sorting, Level of detail, collision detection, standard objects, and physics

UNIT IV GAMING PLATFORMS AND FRAMEWORKS  9
Flash, DirectX, OpenGL, Java, Python, XNA with Visual Studio, Mobile Gaming for the Android, iOS, Game engines - Adventure Game Studio, DXStudio, Unity

UNIT V GAME DEVELOPMENT  9
Developing 2D and 3D interactive games using OpenGL, DirectX – Isometric and Tile Based Games, Puzzle games, Single Player games, Multi Player games.

TOTAL : 45 PERIODS

OUTCOMES:
- To create interactive games

TEXT BOOKS:
REFERENCES:
6. Andy Harris, “Beginning Flash Game Programming For Dummies”, For Dummies; Updated edition, 2005.

CS8073 SEMANTIC WEB L T P C 3 0 0 3

OBJECTIVES:
- To understand the semantic web architecture
- To learn about ontological engineering
- To learn web ontology language
- To discover the capabilities and limitations of semantic web technology for different applications

UNIT I INTRODUCTION 9
UNIT II  ONTOLOGICAL ENGINEERING
Ontologies – Taxonomies – Topic Maps – Classifying Ontologies - Terminological aspects: concepts, terms, relations between them – Complex Objects -Subclasses and Sub-properties definitions –Upper Ontologies – Quality – Uses - Types of terminological resources for ontology building – Methods and methodologies for building ontologies – Multilingual Ontologies -Ontology Development process and Life cycle – Methods for Ontology Learning – Ontology Evolution – Versioning

UNIT III  STRUCTURING AND DESCRIBING WEB RESOURCES

UNIT IV  WEB ONTOLOGY LANGUAGE

UNIT V  SEMANTIC WEB TOOLS AND APPLICATIONS

TOTAL: 45 PERIODS

OUTCOMES:
• To build and implement a small ontology that is semantically descriptive of the chosen problem domain
• To implement applications that can access, use and manipulate the ontology
• To represent data from a chosen problem in XML with appropriate semantic tags obtained or derived from the ontology
• To depict the semantic relationships among the data elements using Resource Description Framework (RDF)
• To design and implement a web services application that “discovers” the data and/or other web services via the semantic web

TEXT BOOKS:
REFERENCES:

CS8074 UNIX INTERNALS LTPC 3003

OBJECTIVES:
- To provide knowledge about Unix operating system working principles, its file system and programming for interprocess communication
- To learn shell programming and filters
- To get an understanding on using various system calls

UNIT I OVERVIEW

UNIT II FILE SUBSYSTEM
Internal representation of files: Inodes – Structure of a regular file – Directories – Conversion of a path name to an Inode – Super block – Inode assignment to a new file – Allocation of disk blocks

UNIT III SYSTEM CALLS FOR THE FILE SYSTEM
UNIT IV  PROCESSES


UNIT V  MEMORY MANAGEMENT AND I/O


TOTAL: 45 PERIODS

OUTCOMES:
- To write UNIX programs using file system calls
- To write UNIX programs for process scheduling and page replacement
- To write UNIX programs on inter-process communication

TEXT BOOK:

REFERENCES:
OBJECTIVES:

- The course explains various moral issues through predominant theories. It educates the code of ethics as well as the industry standards and how they can be used for ensuring safety and reducing the risk. The course enunciated the Rights and Responsibilities of individuals. Various other ethical global issues also have been explained along with case studies.

UNIT I  HUMAN VALUES  10

UNIT II  ENGINEERING ETHICS  9

UNIT III  ENGINEERING AS SOCIAL EXPERIMENTATION  9
Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics– A Balanced Outlook on Law – The Challenger Case Study

UNIT IV  SAFETY, RESPONSIBILITIES AND RIGHTS  9

UNIT V  GLOBAL ISSUES  8

OUTCOMES:

- Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
TEXTBOOK:

REFERENCES:

Web sources:
1. www.onlineethics.org
2. www.nspe.org
3. www.globalethics.org
4. www.ethics.org

MG8654 TOTAL QUALITY MANAGEMENT L T P C 3 0 0 3

AIM
To provide comprehensive knowledge about the principles, practices, tools and techniques of Total quality management.

OBJECTIVES
• To understand the various principles, practices of TQM to achieve quality.
• To learn the various statistical approaches for Quality control.
• To understand the TQM tools for continuous process improvement.
• To learn the importance of ISO and Quality systems
UNIT I  INTRODUCTION

UNIT II  TQM PRINCIPLES
Quality statements - Customer focus –Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Continuous process improvement – PDCA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

UNIT III  TQM TOOLS & TECHNIQUES I

UNIT IV  TQM TOOLS & TECHNIQUES II

UNIT V  QUALITY SYSTEMS

OUTCOMES :
• The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.

TEXT BOOK:

REFERENCES:
OBJECTIVES:
The student should be made to:
- Understand the techniques for processing images including the different File formats used
- Be exposed different image enhancement techniques
- Learn about image segmentation and feature analysis
- Understand the role of multi resolution analysis in image processing
- Study various applications of image processing

UNIT I  FUNDAMENTALS OF IMAGE PROCESSING
Introduction - Steps in image processing systems - Image acquisition - Sampling and Quantization - Pixel relationships - Color fundamentals and models - File Formats, Image operations: Arithmetic, Geometric and Morphological.

UNIT II  IMAGE ENHANCEMENT
Spatial Domain - Gray level transformations - Histogram processing - Spatial filtering - Smoothing and sharpening - Frequency domain: Filtering in frequency domain - DFT, FFT, DCT - Smoothing and sharpening filters - Homomorphic filtering

UNIT III  IMAGE SEGMENTATION AND FEATURE ANALYSIS
Detection of discontinuities - Edge operators - Edge linking and boundary Detection - Thresholding - Region based segmentation - Morphological Watersheds - Motion segmentation, Feature analysis and extraction

UNIT IV  MULTI RESOLUTION ANALYSIS AND COMPRESSIONS

UNIT V  APPLICATIONS OF IMAGE PROCESSING
Image classification - Image recognition - Image understanding - Video motion analysis - Image fusion - Steganography - Digital compositing - Mosaics - Color image processing

OUTCOMES:
At the end of this course, the student will be able to:
- Explain the various steps in image processing
- Compare and Contrast different image enhancement techniques
- Critically analyze various image segmentation and feature analysis
- Apply Multi resolution analysis to image processing
- Design various applications using image processing
TEXT BOOKS:

REFERENCE BOOKS:

IT8072 FREE AND OPEN SOURCE SOFTWARE

OBJECTIVES:
The student should be made to:
- Be exposed to the context and operation of free and open source software (FOSS) communities and associated software projects.
- Be familiar with participating in a FOSS project
- Learn scripting language like Python
- Learn some important FOSS tools

UNIT I PHILOSOPHY
Linux, GNU and Freedom, Brief history of GNU, Licensing free software – GPL and copy Left, trends and potential – global and Indian, overview and usage of various Linux Distributions – userfriendliness perspective – scientific perspective

UNIT II SYSTEM ADMINISTRATION
GNU and Linux installation – Boot process, Commands Using bash features, The man pages, files and file systems, File security, Partitions, Processes, Managing processes, I/O redirection, Graphical environment, Installing software, Backup techniques

UNIT III FOSS PROGRAMMING PRACTICES
GNU debugging tools, Using source code versioning and managing tools, Review of common programming practices and guidelines for GNU/Linux and FOSS, Documentation
UNIT IV PROGRAMMING TECHNIQUES

Application programming – Basics of X Windows server architecture – QT programming – GTK + Programming- Python programming – Open source equivalent of existing Commercial software

UNIT V PROJECTS AND CASE STUDIES

Linux for portable Devices, Creation of Bootable CD and USB from command line, Case Studies – Samba, Libre office, Assistive technology

OUTCOMES:

Upon completion of the course, the student should be able to:

- Install and run open-source operating systems.
- Gather information about Free and Open Source Software projects from software releases and from sites on the internet.
- Build and modify one or more Free and Open Source Software packages.
- Use a version control system.
- Contribute software to and interact with Free and Open Source Software development projects.

TEXT BOOK:


REFERENCE BOOKS:

1. Philosophy of GNU URL: http://www.gnu.org/philosophy/
4. Linux: Rute’s User tutorial and exposition, URL: http://rute.2038bug.com/index.html.gz
5. Version control system, URL: http://git-scm.com/
6. SVN version control, URL: http://svnbook.red-bean.com/
7. GTK+/GNOME
8. Application
9. Development,
10. Havoc
11. Pennington.
12. URL:
14. Python Tutorial, Guido van Rossum, Fred L. Drake, Jr., Editor. URL:
16. Doug Abbot, Linux for Embedded and Embedded and Real time applications , Newnes
17. Case study SAMBA: URL : http://www.samba.org/

IT8073 TCP/IP DESIGN AND IMPLEMENTATION L T P C
3 0 0 3

OBJECTIVES:
• To learn the basics of socket programming using TCP Sockets.
• To learn about Socket Options
• To learn to develop Macros for including Objects In MIB Structure
• To understand SNMPv1, v2 and v3 protocols & practical issues.

UNIT I  FUNDAMENTALS
Internetworking concepts - IP and datagram forwarding - TCP services - Interactive data flow - Timeout and retransmission - Bulk data flow - Persist timer – Keep-alive timer

UNIT II  ARP AND IP
Structure of TCP/IP in OS - Data structures for ARP - Cache design and management - IP software design and organization - Sending a datagram to IP

UNIT III IP ROUTING IMPLEMENTATION
Routing table - Routing algorithms - Fragmentation and reassembly - Error processing (ICMP) - Multicast Processing (IGMP)

UNIT IV TCP I/O PROCESSING AND FSM
Data structure and input processing - Transmission control blocks - Segment format - Comparison - Finite state machine implementation - Output processing - Mutual exclusion - Computing TCP data length
UNIT V \hspace{1cm} TCP TIMER AND FLOW CONTROL

Timers - Events and messages - Timer process - Deleting and inserting timer event - Flow control and adaptive retransmission - Congestion avoidance and control - Urgent data processing and push function

TOTAL : 45 PERIODS

OUTCOMES:
At the end of this course the student should be able to
- Understand the internals of the TCP/IP protocols
- Understand how TCP/IP is actually implemented
- Understand the interaction among the protocols in a protocol stack

TEXT BOOKS

REFERENCE:

CS8075 FOUNDATION SKILLS IN INTEGRATED PRODUCT DEVELOPMENT

OBJECTIVE:
This program can be offered with all Undergraduate programs/courses for all engineering streams. The FSIPD program aims to improve student's awareness and understanding of the basic concepts involved in Integrated product Development (IPD) by providing exposure to the key product development concepts. Students, who complete this program, will stand a better chance to be considered for jobs in the Engineering industry.

COURSE OBJECTIVES:
After completing this program, the student will be able to obtain the technical skills needed to effectively play the entry level design engineer role in an engineering organization.
The student will be able to:
- Understand the global trends and development methodologies of various types of products and services
- Conceptualize, prototype and develop product management plan for a new product based on the type of the new product and development methodology integrating the hardware, software, controls, electronics and mechanical systems
- Understand requirement engineering and know how to collect, analyze and arrive at requirements for new product development and convert them into design specification
- Understand system modeling for system, sub-system and their interfaces and arrive at the optimum system specification and characteristics
- Gain knowledge of the Innovation & Product Development process in the Business Context

UNIT I  FUNDAMENTALS OF PRODUCT DEVELOPMENT  9

UNIT II  REQUIREMENTS AND SYSTEM DESIGN  9

UNIT III  DESIGN AND TESTING  9

UNIT IV  SUSTENANCE ENGINEERING AND END-OF-LIFE (EOL) SUPPORT  9
UNIT V  BUSINESS DYNAMICS ENGINEERING SERVICES INDUSTRY  9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
The students will be able to
- Define, formulate and analyze a problem
- Solve specific problems independently or as part of a team
- Develop documentation, test specifications and coordinate with various teams to validate and sustain up to the EoL (End of Life) support activities for engineering customer
- Work independently as well as in teams
- Manage a project from start to finish

COURSE MATERIAL AND PEDAGOGY:
- NASSCOM has agreed to prepare / revise the course materials [selected teachers Anna University from major disciplines will be included in the process] as PPT slides for all theUNITS. The PPTs can be printed and given to each student if necessary at a Nominal Fee. This is the best possible material for this special course.
- NASSCOM will train the teachers of Anna University to enable them to teach this course. A training programme for nearly 3500 teachers needs to be organized. The team is exploring use of technology including the EDUSAT facility at Anna University.
- The course is to be offered as an elective to all UG Students both in the Constituent Colleges and Affiliated colleges of Anna University.

TEXT BOOKS [INDIAN ECONOMY EDITIONS]:

REFERENCES:
OBJECTIVES:

- To provide students an exposure to disasters, their significance and types.
- To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction.
- To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR).
- To enhance awareness of institutional processes in the country and
- To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity.

UNIT I INTRODUCTION TO DISASTERS

Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc. – Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts -in terms of caste, class, gender, age, location, disability - Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don’ts during various types of Disasters.

UNIT II APPROACHES TO DISASTER RISK REDUCTION (DRR)

Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stake-holders- Institutional Processess and Framework at State and Central Level- State Disaster Management Authority(SDMA) – Early Warning System – Advisories from Appropriate Agencies.

UNIT III INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT

Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India - Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT IV DISASTER RISK MANAGEMENT IN INDIA

Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy - Other related policies, plans, programmes and legislation – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.
UNIT V  DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS

Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

TOTAL: 45 PERIODS

OUTCOMES:
The students will be able to

- Differentiate the types of disasters, causes and their impact on environment and society
- Assess vulnerability and various methods of risk reduction measures as well as mitigation.
- Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management

TEXTBOOK:

REFERENCES
1. Govt. of India: Disaster Management Act, Government of India, New Delhi, 2005
OBJECTIVES:
- To sensitize the Engineering students to various aspects of Human Rights.

UNIT I

UNIT II

UNIT III
Theories and perspectives of UN Laws – UN Agencies to monitor and compliance.

UNIT IV
Human Rights in India – Constitutional Provisions / Guarantees.

UNIT V

TOTAL : 45 PERIODS

OUTCOMES:
- Engineering students will acquire the basic knowledge of human rights.

REFERENCES: