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TOTAL : 28 CREDITS

10. - English Language Laboratory * 0 0 2 -

* Common to all B.E. / B.Tech. Programmes

+ Offering English Language Laboratory as an additional subject (with no marks) during 2nd semester may be decided by the respective Colleges affiliated to Anna University Chennai.

### A. CIRCUIT BRANCHES

#### I Faculty of Electrical Engineering
1. B.E. Electrical and Electronics Engineering
2. B.E. Electronics and Instrumentation Engineering
3. B.E. Instrumentation and Control Engineering

#### II Faculty of Information and Communication Engineering
1. B.E. Computer Science and Engineering
2. B.E. Electronics and Communication Engineering
3. B.E. Bio Medical Engineering
4. B.Tech. Information Technology

### B. NON – CIRCUIT BRANCHES

#### I Faculty of Civil Engineering
1. B.E. Civil Engineering

#### II Faculty of Mechanical Engineering
1. B.E. Aeronautical Engineering
2. B.E. Automobile Engineering
3. B.E. Marine Engineering
4. B.E. Mechanical Engineering
5. B.E. Production Engineering
III Faculty of Technology
1. B.Tech. Chemical Engineering
2. B.Tech. Biotechnology
3. B.Tech. Polymer Technology
4. B.Tech. Textile Technology
5. B.Tech. Textile Technology (Fashion Technology)
7. B.Tech. Plastics Technology

SEMESTER III
(Applicable to the students admitted from the Academic year 2008–2009 onwards)

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## SEMESTER VII – Elective IV

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## SEMESTER VIII – Elective VI

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AIM:
To encourage students to actively involve in participative learning of English and to help them acquire Communication Skills.

OBJECTIVES:
1. To help students develop listening skills for academic and professional purposes.
2. To help students acquire the ability to speak effectively in English in real-life situations.
3. To inculcate reading habit and to develop effective reading skills.
4. To help students improve their active and passive vocabulary.
5. To familiarize students with different rhetorical functions of scientific English.
6. To enable students write letters and reports effectively in formal and business situations.

UNIT I
12
Technical Vocabulary - meanings in context, sequencing words, Articles- Prepositions, intensive reading& predicting content, Reading and interpretation, extended definitions, Process description

Suggested activities:
1. Exercises on word formation using the prefix ‘self’ - Gap filling with preposition.
2. Exercises - Using sequence words.
3. Reading comprehension exercise with questions based on inference – Reading headings
4. and predicting the content – Reading advertisements and interpretation.
5. Writing extended definitions – Writing descriptions of processes – Writing paragraphs based on discussions – Writing paragraphs describing the future.

UNIT II
12

Suggested activities:
1. Reading comprehension exercises with questions on overall content – Discussions analyzing stylistic features (creative and factual description) - Reading comprehension exercises with texts including graphic communication - Exercises in interpreting non-verbal communication.
2. Listening comprehension exercises to categorise data in tables.
3. Writing formal letters, quotations, clarification, complaint – Letter seeking permission for Industrial visits– Writing analytical paragraphs on different debatable issues.

UNIT III
12
Cause and effect expressions – Different grammatical forms of the same word - Speaking – stress and intonation, Group Discussions - Reading – Critical reading - Listening, - Writing – using connectives, report writing – types, structure, data collection, content, form, recommendations.
Suggested activities:
1. Exercises combining sentences using cause and effect expressions – Gap filling exercises using the appropriate tense forms – Making sentences using different grammatical forms of the same word. (Eg: object – verb / object – noun)
2. Speaking exercises involving the use of stress and intonation – Group discussions – analysis of problems and offering solutions.
3. Reading comprehension exercises with critical questions, Multiple choice question.

UNIT IV
12
Numerical adjectives – Oral instructions – Descriptive writing – Argumentative paragraphs – Letter of application - content, format (CV / Bio-data) - Instructions, imperative forms - Checklists, Yes/No question form – E-mail communication.

Suggested Activities:
1. Rewriting exercises using numerical adjectives.
2. Reading comprehension exercises with analytical questions on content – Evaluation of content.
3. Listening comprehension – entering information in tabular form, intensive listening exercise and completing the steps of a process.
4. Speaking - Role play – group discussions – Activities giving oral instructions.

UNIT V
9
Speaking - Discussion of Problems and solutions - Creative and critical thinking – Writing an essay, Writing a proposal.

Suggested Activities:
1. Case Studies on problems and solutions
2. Brain storming and discussion
3. Writing Critical essays
4. Writing short proposals of 2 pages for starting a project, solving problems, etc.
5. Writing advertisements.

TOTAL: 60 PERIODS

TEXT BOOK:
REFERENCES:

Extensive Reading:

Note:
The book listed under Extensive Reading is meant for inculcating the reading habit of the students. They need not be used for testing purposes.

MA2161 MATHEMATICS – II

UNIT I ORDINARY DIFFERENTIAL EQUATIONS 12
Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy’s and Legendre’s linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT II VECTOR CALCULUS 12

UNIT III ANALYTIC FUNCTIONS 12
Functions of a complex variable – Analytic functions – Necessary conditions, Cauchy – Riemann equation and Sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping : w= z+c, cz, 1/z, and bilinear transformation.

UNIT IV COMPLEX INTEGRATION 12
UNIT V LAPLACE TRANSFORM


Definition of Inverse Laplace transform as contour integral – Convolution theorem (excluding proof) – Initial and Final value theorems – Solution of linear ODE of second order with constant coefficients using Laplace transformation techniques.

TOTAL: 60 PERIODS

TEXT BOOKS:

REFERENCES:

PH2161 ENGINEERING PHYSICS – II L T P C
3 0 0 3

UNIT I CONDUCTING MATERIALS

UNIT II SEMICONDUCTING MATERIALS
UNIT III MAGNETIC AND SUPERCONDUCTING MATERIALS

Superconductivity : properties - Types of super conductors – BCS theory of superconductivity(Qualitative) - High Tc superconductors – Applications of superconductors – SQUID, cryotron, magnetic levitation.

UNIT IV DIELECTRIC MATERIALS


UNIT V MODERN ENGINEERING MATERIALS

Metallic glasses: preparation, properties and applications.
Shape memory alloys (SMA): Characteristics, properties of NiTi alloy, application, advantages and disadvantages of SMA

TOTAL: 45 PERIODS

TEXT BOOKS:

2. Charles P. Poole and Frank J.Ownen, 'Introduction to Nanotechnology’, Wiley India(2007) (for Unit V)

REFERENCES:


CY2161 ENGINEERING CHEMISTRY – II

AIM

To impart a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.
OBJECTIVES

- The student should be conversant with the principles of electrochemistry, electrochemical cells, EMF and applications of EMF measurements.
- Principles of corrosion control
- Chemistry of Fuels and combustion
- Industrial importance of Phase rule and alloys
- Analytical techniques and their importance.

UNIT I ELECTROCHEMISTRY


UNIT II CORROSION AND CORROSION CONTROL


UNIT III FUELS AND COMBUSTION


UNIT IV PHASE RULE AND ALLOYS


UNIT V ANALYTICAL TECHNIQUES


TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

ME2151 ENGINEERING MECHANICS L T P C
3 1 0 4

OBJECTIVE:
At the end of this course the student should be able to understand the vectorial and scalar representation of forces and moments, static equilibrium of particles and rigid bodies both in two dimensions and also in three dimensions. Further, he should understand the principle of work and energy. He should be able to comprehend the effect of friction on equilibrium. He should be able to understand the laws of motion, the kinematics of motion and the interrelationship. He should also be able to write the dynamic equilibrium equation. All these should be achieved both conceptually and through solved examples.

UNIT I BASICS & STATICS OF PARTICLES 12

UNIT II EQUILIBRIUM OF RIGID BODIES 12

UNIT III PROPERTIES OF SURFACES AND SOLIDS 12
UNIT IV DYNAMICS OF PARTICLES

UNIT V FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS

TEXT BOOK:

REFERENCES:

EE2151 CIRCUIT THEORY (Common to EEE, EIE and ICE Branches) 3 1 0 4

UNIT I BASIC CIRCUITS ANALYSIS

UNIT II NETWORK REDUCTION AND NETWORK THEOREMS FOR DC AND AC CIRCUITS:
Network reduction: voltage and current division, source transformation – star delta conversion. Thevenins and Novton & Theorem – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem.

UNIT III RESONANCE AND COUPLED CIRCUITS
UNIT IV        TRANSIENT RESPONSE FOR DC CIRCUITS  12
Transient response of RL, RC and RLC Circuits using Laplace transform for DC input
and A.C. with sinusoidal input.

UNIT V        ANALYSING THREE PHASE CIRCUITS  12
Three phase balanced / unbalanced voltage sources – analysis of three phase 3-wire
and 4-wire circuits with star and delta connected loads, balanced & un balanced –
phasor diagram of voltages and currents – power and power factor measurements in
three phase circuits.

TOTAL :60 PERIODS

TEXT BOOKS:
2. Sudhakar A and Shyam Mohan SP, “Circuits and Network Analysis and

REFERENCES:
1. Paranjothi SR, “Electric Circuits Analysis,” New Age International Ltd., New Delhi,
   (1996).
   Delhi, (1999).

EC2151        ELECTRIC CIRCUITS AND ELECTRON DEVICES  L T P C
(For ECE, CSE, IT and Biomedical Engg. Branches)  3 1 0 4

UNIT I        CIRCUIT ANALYSIS TECHNIQUES  12
Kirchoff’s current and voltage laws – series and parallel connection of independent
sources – R, L and C – Network Theorems – Thevenin, Superposition, Norton,
Maximum power transfer and duality – Star-delta conversion.

UNIT II       TRANSIENT RESONANCE IN RLC CIRCUITS  12
Basic RL, RC and RLC circuits and their responses to pulse and sinusoidal inputs –
frequency response – Parallel and series resonances – Q factor – single tuned and
double tuned circuits.

UNIT III      SEMICONDUCTOR DIODES  12
Review of intrinsic & extrinsic semiconductors – Theory of PN junction diode – Energy
band structure – current equation – space charge and diffusion capacitances – effect of
temperature and breakdown mechanism – Zener diode and its characteristics.
UNIT IV  TRANSISTORS  12
Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and comparison of their characteristics – Breakdown in transistors – operation and comparison of N-Channel and P-Channel JFET – drain current equation – MOSFET – Enhancement and depletion types – structure and operation – comparison of BJT with MOSFET – thermal effect on MOSFET.

UNIT V  SPECIAL SEMICONDUCTOR DEVICES  (Qualitative Treatment only)  12

TOTAL: 60 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT III  SEMICONDUCTOR DEVICES AND APPLICATIONS  12

UNIT IV  DIGITAL ELECTRONICS  12
Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders – Flip-Flops – Registers and Counters – A/D and D/A Conversion (single concepts)

UNIT V  FUNDAMENTALS OF COMMUNICATION ENGINEERING  12
Communication Systems: Radio, TV, Fax, Microwave, Satellite and Optical Fibre (Block Diagram Approach only).
TOTAL: 60 PERIODS

TEXT BOOKS:

REFERENCES:

GE2152  BASIC CIVIL & MECHANICAL ENGINEERING  L T P C
(Common to branches under Electrical and I & C Faculty)  4 0 0 4

A – CIVIL ENGINEERING

UNIT I  SURVEYING AND CIVIL ENGINEERING MATERIALS  15
UNIT II BUILDING COMPONENTS AND STRUCTURES 15

 Foundations: Types, Bearing capacity – Requirement of good foundations.

 elasticity – Types of Bridges and Dams – Basics of Interior Design and Landscaping.

 TOTAL: 30 PERIODS

B – MECHANICAL ENGINEERING

UNIT III POWER PLANT ENGINEERING 10


UNIT IV I C ENGINES 10

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

UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM 10


 TOTAL: 30 PERIODS

REFERENCES:


GE2155 COMPUTER PRACTICE LABORATORY – II L T P C

0 1 2 2

LIST OF EXPERIMENTS

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

2. SHELL PROGRAMMING
   Simple Shell program - Conditional Statements - Testing and Loops
HARDWARE / SOFTWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS

**Hardware**
- 1 UNIX Clone Server
- 33 Nodes (thin client or PCs)
- Printer – 3 Nos.

**Software**
- OS – UNIX Clone (33 user license or License free Linux)
- Compiler - C

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GS2165  
**PHYSICS LABORATORY – II**  

**LIST OF EXPERIMENTS**

1. Determination of Young’s modulus of the material – non uniform bending.
2. Determination of Band Gap of a semiconductor material.
3. Determination of specific resistance of a given coil of wire – Carey Foster Bridge.
5. Spectrometer dispersive power of a prism.
6. Determination of Young’s modulus of the material – uniform bending.

- A minimum of FIVE experiments shall be offered.
- Laboratory classes on alternate weeks for Physics and Chemistry.
- The lab examinations will be held only in the second semester.

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GS2165  
**CHEMISTRY LABORATORY – II**  

**LIST OF EXPERIMENTS**

1. Conduct metric titration (Simple acid base)
2. Conduct metric titration (Mixture of weak and strong acids)
3. Conduct metric titration using BaCl₂ vs. Na₂SO₄
4. Potentiometric Titration (Fe²⁺ / KMnO₄ or K₂Cr₂O₇)
5. PH titration (acid & base)
6. Determination of water of crystallization of a crystalline salt (Copper sulphate)

7. Estimation of Ferric iron by spectrophotometry.
   - A minimum of FIVE experiments shall be offered.
   - Laboratory classes on alternate weeks for Physics and Chemistry.
   - The lab examinations will be held only in the second semester.

List of Exercises using software capable of Drafting and Modeling

1. Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.
2. Drawing of a Title Block with necessary text and projection symbol.
3. Drawing of curves like parabola, spiral, involute using Bspline or cubic spline.
4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc, and dimensioning.
5. Drawing front view, top view and side view of objects from the given pictorial views (eg. V-block, Base of a mixie, Simple stool, Objects with hole and curves).
6. Drawing a plan of residential building ( Two bed rooms, kitchen, hall, etc.)
7. Drawing of a simple steel truss.
8. Drawing sectional views of prism, pyramid, cylinder, cone, etc,
10. Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model.

Note: Plotting of drawings must be made for each exercise and attached to the records written by students.

List of Equipments for a batch of 30 students:

1. Pentium IV computer or better hardware, with suitable graphics facility -30 No.
2. Licensed software for Drafting and Modeling. – 30 Licenses
3. Laser Printer or Plotter to print / plot drawings – 2 No.
LIST OF EXPERIMENTS

1. Verification of ohm’s laws and kirchoff’s laws.
2. Verification of Thevemin’s and Norton’s Theorem
3. Verification of superposition Theorem
4. Verification of maximum power transfer theorem.
5. Verification of reciprocity theorem
6. Measurement of self inductance of a coil
7. Verification of mesh and nodal analysis.
8. Transient response of RL and RC circuits for DC input.
10. Frequency response of single tuned coupled circuits.

TOTAL: 45 PERIODS

1. Verification of KVL and KCL
2. Verification of Thevenin and Norton Theorems.
3. Verification of superposition Theorem.
4. Verification of Maximum power transfer and reciprocity theorems.
5. Frequency response of series and parallel resonance circuits.
6. Characteristics of PN and Zener diode
7. Characteristics of CE configuration
8. Characteristics of CB configuration
9. Characteristics of UJT and SCR
10. Characteristics of JFET and MOSFET

TOTAL: 45 PERIODS
ENGLISH LANGUAGE LABORATORY (Optional)  

1. Listening: 5
Listening & answering questions – gap filling – Listening and Note taking - Listening to telephone conversations

2. Speaking: 5
Pronouncing words & sentences correctly – word stress – Conversation practice.

Classroom Session 20

1. Speaking: Introducing oneself, Introducing others, Role play, Debate
   Presentations: Body language, gestures, postures.
   Group Discussions etc
2. Goal setting – interviews – stress time management – situational reasons

Evaluation
(1) Lab Session – 40 marks
   Listening – 10 marks
   Speaking – 10 marks
   Reading – 10 marks
   Writing – 10 marks

(2) Classroom Session – 60 marks
   Role play activities giving real life context – 30 marks
   Presentation – 30 marks

Note on Evaluation:
1. Examples for role play situations:
   a. Marketing engineer convincing a customer to buy his product.
   b. Telephone conversation – Fixing an official appointment / Enquiry on availability of flight or train tickets / placing an order. etc.

2. Presentations could be just a Minute (JAM activity) or an Extempore on simple topics or visuals could be provided and students could be asked to talk about it.

REFERENCES:
LAB REQUIREMENTS:
1. Teacher – Console and systems for students
2. English Language Lab Software
3. Tape Recorders.

MA2211 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS L T P C
(Common to all branches) 3 1 0 4

OBJECTIVES
The course objective is to develop the skills of the students in the areas of Transforms and Partial Differential Equations. This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory. The course will also serve as a prerequisite for post graduate and specialized studies and research.

UNIT I FOURIER SERIES 9 +3

UNIT II FOURIER TRANSFORMS 9+3

UNIT III PARTIAL DIFFERENTIAL EQUATIONS 9+3
Formation of partial differential equations – Lagrange’s linear equation – Solutions of standard types of first order partial differential equations - Linear partial differential equations of second and higher order with constant coefficients.

UNIT IV APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS 9 + 3
Solutions of one dimensional wave equation – One dimensional equation of heat conduction – Steady state solution of two-dimensional equation of heat conduction (Insulated edges excluded) – Fourier series solutions in cartesian coordinates.

UNIT V Z -TRANSFORMS AND DIFFERENCE EQUATIONS 9+3

Lectures : 45  Tutorials : 15 TOTAL : 60 PERIODS

TEXT BOOK:
REFERENCES:

CS 2201 DATA STRUCTURES L T P C
3 1 0 4

AIM:
To master the design and applications of linear, tree, balanced tree, hashing, set, and graph structures.

UNIT I LINEAR STRUCTURES
Abstract Data Types (ADT) – List ADT – array-based implementation – linked list implementation – cursor-based linked lists – doubly-linked lists – applications of lists – Stack ADT – Queue ADT – circular queue implementation – Applications of stacks and queues

UNIT II TREE STRUCTURES

UNIT III BALANCED TREES
AVL Trees – Splay Trees – B-Tree - heaps – binary heaps – applications of binary heaps

UNIT IV HASHING AND SET

UNIT V GRAPHS

TOTAL: 45 PERIODS

TEXT BOOK:
REFERENCES:

CS 2202 DIGITAL PRINCIPLES AND SYSTEM DESIGN L T P C
(Common to CSE & IT) 3 1 0 4

AIM:
To provide an in-depth knowledge of the design of digital circuits and the use of Hardware Description Language in digital system design.

OBJECTIVES:
• To understand different methods used for the simplification of Boolean functions
• To design and implement combinational circuits
• To design and implement synchronous sequential circuits
• To design and implement asynchronous sequential circuits
• To study the fundamentals of VHDL / Verilog HDL

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 8

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

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

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

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

TUTORIAL: 15 TOTAL : 60 PERIODS

TEXT BOOK:
REFERENCES

CS 2203 OBJECT-ORIENTED PROGRAMMING L T P C
(Common to CSE & IT) 3 0 0 3

AIM:
To understand the concepts of object-oriented programming and master OOP using C++.

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

TOTAL: 45 PERIODS

TEXT BOOK:
REFERENCES:

CS2204  ANALOG AND DIGITAL COMMUNICATION  L T P C
         3 1 0 4
UNIT I  FUNDAMENTALS OF ANALOG COMMUNICATION  9
Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves.

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

UNIT III  DIGITAL TRANSMISSION  9

UNIT IV  DATA COMMUNICATIONS  9
Introduction, History of Data communications, Standards Organizations for data communication, data communication circuits, data communication codes, Error control, Error Detection, Error correction, Data communication Hardware, serial and parallel interfaces, data modems, Asynchronous modem, Synchronous modem, low-speed modem, medium and high speed modem, modem control.

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

TOTAL: 60 PERIODS

TEXT BOOKS:
REFERENCES:

GE 2021 ENVIROEMNTAL SCIENCE AND ENGINEERING L T P C 3 0 0 3

AIM
- The aim of this course is to create awareness in every engineering graduate about the importance of environment, the effect of technology on the environment and ecological balance and make them sensitive to the environment problems in every professional Endeavour that they participates.

OBJECTIVE
- At the end of this course the student is expected to understand what constitutes the environment, what are precious resources in the environment, how to conserve these resources, what is the role of a human being in maintaining a clean environment and useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity. The role of government and non-government organization in environment managements.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14
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 – solid waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES
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

TEXT BOOKS:
REFERENCES BOOKS:

CS 2207 DIGITAL LABORATORY L T P C
(Common to CSE & IT) 0 0 3 2

LIST OF EXPERIMENTS

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

(Common to Information Technology & Computer Science Engineering)
List of equipments and components for a batch of 30 students (2 per batch)

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<thead>
<tr>
<th>S.NO</th>
<th>Name of equipment/ component</th>
<th>Quantity Reqd</th>
<th>Remarks</th>
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<td>Dual power supply/ single mode powersupply</td>
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<td>IC Trainer</td>
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<td>Bread Boards</td>
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<td>28</td>
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<td>Single strand</td>
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<tr>
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AIM:
To develop programming skills in design and implementation of data structures and their applications.

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

TOTAL: 45 PERIODS

List of Equipments and components for A Batch of 30 students (1 per batch)

1. SOFTWARE REQUIRED – TURBOC version 3 or GCC version 3.3.4.
2. OPERATING SYSTEM – WINDOWS 2000 / XP / NT OR LINUX
3. COMPUTERS REQUIRED – 30 Nos. (Minimum Requirement : Pentium III or Pentium IV with 256 RAM and 40 GB harddisk)
6. Develop templates of standard sorting algorithms such as bubble sort, insertion sort, merge sort, and quick sort.
7. Design stack and queue classes with necessary exception handling.
8. Define Point class and an Arc class. Define a Graph class which represents graph as a collection of Point objects and Arc objects. Write a method to find a minimum cost spanning tree in a graph.
9. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism and RTTI.
10. Write a C++ program that randomly generates complex numbers (use previously designed Complex class) and writes them two per line in a file along with an operator (+, -, *, or /). The numbers are written to file in the format (a + ib). Write another program to read one line at a time from this file, perform the corresponding operation on the two complex numbers read, and write the result to another file (one per line).

(Common to Information Technology & Computer Science Engineering)

List of Equipments and software for a batch of 30 students

1. PC – 30 nos.
   - Processor – 2.0 GHz or higher
   - RAM – 256 MB or higher
   - Hard disk – 20 GB or higher
   - OS- Windows 2000/ Windows XP/ NT

2. Software – Turbo C (freeware) – to be installed in all PC’s.

MA 2262 PROBABILITY AND QUEUEING THEORY
(Common to CSE & IT) 3 1 0 4

AIM

The probabilistic models are employed in countless applications in all areas of science and engineering. Queuing theory provides models for a number of situations that arise in real life. The course aims at providing necessary mathematical support and confidence to tackle real life problems.

OBJECTIVES:

At the end of the course, the students would
- Have a well – founded knowledge of standard distributions which can describe real life phenomena.
- Acquire skills in handling situations involving more than one random variable and functions of random variables.
- Understand and characterize phenomena which evolve with respect to time in a probabilistic manner.
- Be exposed to basic characteristic features of a queuing system and acquire skills in analyzing queuing models.
UNIT I  RANDOM VARIABLES  9+3
Discrete and continuous random variables - Moments - Moment generating functions and their properties. Binomial, Poisson, Geometric, Negative binomial, Uniform, Exponential, Gamma, and Weibull distributions.

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

UNIT III  MARKOV PROCESSES AND MARKOV CHAINS  9+3
Classification - Stationary process - Markov process - Markov chains - Transition probabilities - Limiting distributions - Poisson process

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

UNIT V  NON-MARKOVIAN QUEUES AND QUEUE NETWORKS  9+3
M/G/1 queue- Pollaczek- Khintchine formula, series queues- open and closed networks

TUTORIAL 15, TOTAL: 60 PERIODS

TEXT BOOKS:
1. O.C. Ibe, “Fundamentals of Applied Probability and Random Processes”, Elsevier, 1st Indian Reprint, 2007 (For units 1, 2 and 3).

REFERENCES:

CS 2251  DESIGN AND ANALYSIS OF ALGORITHMS  L T P C
3 1 0 4

UNIT I
UNIT II

UNIT III
Dynamic Programming: General Method – Multistage Graphs – All-Pair shortest paths – Optimal binary search trees – 0/1 Knapsack – Travelling salesperson problem.

UNIT IV

UNIT V
Graph Traversals – Connected Components – Spanning Trees – Biconnected components – Branch and Bound: General Methods (FIFO & LC) – 0/1 Knapsack problem – Introduction to NP-Hard and NP-Completeness.

TUTORIAL= 15, TOTAL: 60 PERIODS

TEXT BOOKS:

REFERENCES:

CS2252 MICROPROCESSORS AND MICROCONTROLLERS
(Common to CSE & IT)

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

UNIT II 8086 SOFTWARE ASPECTS
UNIT III  MULTIPROCESSOR CONFIGURATIONS
Coprocessor Configuration – Closely Coupled Configuration – Loosely Coupled Configuration – 8087 Numeric Data Processor – Data Types – Architecture – 8089 I/O Processor – Architecture – Communication between CPU and IOP.

UNIT IV  I/O INTERFACING

UNIT V  MICROCONTROLLERS

TOTAL: 45 PERIODS

TEXT BOOKS:
1. Ramesh S. Gaonkar, “Microprocessor – Architecture, Programming and Applications with the 8085” Penram International Publisher, 5th Ed., 2006

REFERENCES:
UNIT III PIPELINING
Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling.

UNIT IV MEMORY SYSTEM

UNIT V I/O ORGANIZATION

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS 2254 OPERATING SYSTEMS (Common to CSE & IT) L T P C 3 0 0 3

AIM:
To learn the various aspects of operating systems such as process management, memory management, and I/O management

UNIT I PROCESSES AND THREADS
UNIT II  PROCESS SCHEDULING AND SYNCHRONIZATION  10

UNIT III  STORAGE MANAGEMENT  9

UNIT IV  FILE SYSTEMS  9

UNIT V  I/O SYSTEMS  8

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS 2255  DATABASE MANAGEMENT SYSTEMS  L T P C
(Common to CSE & IT)  3 0 0 3

UNIT I  INTRODUCTION  9
UNIT II  RELATIONAL MODEL  9

UNIT III  DATABASE DESIGN  9

UNIT IV  TRANSACTIONS  9

UNIT V  IMPLEMENTATION TECHNIQUES  9

TOTAL :45 PERIODS

TEXT BOOKS:

REFERENCES:
1. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
2. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
3. Write C programs to simulate UNIX commands like ls, grep, etc.
4. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
5. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
6. Developing Application using Inter Process communication (using shared memory, pipes or message queues)
8. Implement some memory management schemes – I
9. Implement some memory management schemes – II
10. Implement any file allocation technique (Linked, Indexed or Contiguous)

Example for exercises 8 & 9:
Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process-id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process-id, starting byte address and the ending byte address of the allocated space. When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.

Hardware and Software required for a batch of 30 students.

**HARDWARE:**
30 Personal Computers

**SOFTWARE:**
**Linux:**
- Ubuntu / OpenSUSE / Fedora / Red Hat / Debian / Mint OS

Linux could be loaded in individual PCs.

(OR)
A single server could be loaded with Linux and connected from the individual PCs.

**TOTAL:** 45 PERIODS
1. Data Definition, Table Creation, Constraints,
2. Insert, Select Commands, Update & Delete Commands.
3. Nested Queries & Join Queries
4. Views
5. High level programming language extensions (Control structures, Procedures and Functions).
6. Front end tools
7. Forms
8. Triggers
9. Menu Design
10. Reports.
11. Database Design and implementation (Mini Project).

(Common to Information Technology & Computer Science Engineering)

Hardware and Software required for a batch of 30 students:

**Hardware:**

30 Personal Computers

**Software:**

Front end: VB/VC ++/JAVA
Back end: Oracle 11g, my SQL, DB2
Platform: Windows 2000 Professional/XP
Oracle server could be loaded and can be connected from individual PCs.

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**CS2259 MICROPROCESSORS LABORATORY**

(Common to CSE & IT)

**AIM:**

- To learn the assembly language programming of 8085, 8086 and 8051 and also to give a practical training of interfacing the peripheral devices with the processor.

**OBJECTIVES:**

- To implement the assembly language programming of 8085, 8086 and 8051.
- To study the system function calls like BIOS/DOS.
- To experiment the interface concepts of various peripheral device with the processor.
Experiments in the following:
1. Programming with 8085
2. Programming with 8086-experiments including BIOS/DOS calls:
   Keyboard control, Display, File Manipulation.
3. Interfacing with 8085/8086-8255,8253
4. Interfacing with 8085/8086-8279,8251
5. 8051 Microcontroller based experiments for Control Applications
6. Mini- Project

TOTAL: 45 PERIODS

List of equipments/components for 30 students (two per batch)

1. 8085 Trainer Kit with onboard 8255, 8253, 8279 and 8251 – 15 nos.
2. TASM/MASM simulator in PC (8086 programs) – 30 nos.
3. 8051 trainer kit – 15 nos.
4. Interfacing with 8086 – PC add-on cards with 8255, 8253, 8279 and 8251 – 15 nos.
5. Stepper motor interfacing module – 5 nos.
7. ADC, DAC interfacing module – 5 nos.
8. CRO’s – 5 nos.

CS2301 SOFTWARE ENGINEERING L T P C
3 0 0 3

UNIT I SOFTWARE PRODUCT AND PROCESS

UNIT II SOFTWARE REQUIREMENTS

UNIT III ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES

UNIT IV TESTING
UNIT V  SOFTWARE PROJECT MANAGEMENT


TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

MA2265  DISCRETE MATHEMATICS

L T P C
3 1 0 4

AIM
To extend student’s Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

OBJECTIVES:
At the end of the course, students would
- Have knowledge of the concepts needed to test the logic of a program..
- Have an understanding in identifying structures on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.
- Be aware of the counting principles
- Be exposed to concepts and properties of algebraic structures such as semi groups, monoids and groups.
UNIT I LOGIC AND PROOFS 9 + 3
Propositional Logic – Propositional equivalences-Predicates and quantifiers-Nested
Quantifiers-Rules of inference-introduction to Proofs-Proof Methods and strategy

UNIT II COMBINATORICS 9 + 3
Mathematical inductions-Strong induction and well ordering- The basics of counting-The
pigeonhole principle -Permutations and combinations-Recurrence relations-Solving
Linear recurrence relations-generating functions-inclusion and exclusion and
applications.

UNIT III GRAPHS 9 + 3
Graphs and graph models-Graph terminology and special types of graphs-Representing
graphs and graph isomorphism -connectivity-Euler and Hamilton paths

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

UNIT V LATTICES AND BOOLEAN ALGEBRA 9 + 3
Partial ordering-Posets-Lattices as Posets- Properties of lattices-Lattices as Algebraic
systems –Sub lattices –direct product and Homomorphism-Some Special lattices-
Boolean Algebra

L: 45, T: 15, TOTAL: 60 PERIODS

TEXT BOOKS:
   Sections 1.1 to 1.7 , 4.1 & 4.2, 5.1 to 5.3, 6.1, 6.2, 6.4 to 6.6, 8.1 to 8.5)
2. Trembly J.P and Manohar R, “Discrete Mathematical Structures with Applications to
   (2007).(For units 4 & 5, Sections 2-3.8 & 2-3.9,3-1,3-2 & 3-5, 4-1 & 4-2)

REFERENCES:
2. Thomas Koshy, ”Discrete Mathematics with Applications”, Elsevier Publications,
3. Seymour Lipschutz and Mark Lipson, ”Discrete Mathematics”, Schaum’s Outlines,

CS2302 COMPUTER NETWORKS L T P C 3 0 0 3

UNIT I 9
Network architecture – layers – Physical links – Channel access on links – Hybrid
multiple access techniques - Issues in the data link layer - Framing – Error correction
and detection – Link-level Flow Control
UNIT II
Medium access – CSMA – Ethernet – Token ring – FDDI - Wireless LAN – Bridges and Switches

UNIT III

UNIT IV

UNIT V

TOTAL: 45 PERIODS

TEXT BOOK :

REFERENCES:

CS2303 THEORY OF COMPUTATION

UNIT I AUTOMATA

UNIT II REGULAR EXPRESSIONS AND LANGUAGES
Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.
UNIT III  CONTEXT-FREE GRAMMARS AND LANGUAGES  9
Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages –
Definition of the Pushdown automata – Languages of a Pushdown Automata –
Equivalence of Pushdown automata and CFG– Deterministic Pushdown Automata.

UNIT IV  PROPERTIES OF CONTEXT-FREE LANGUAGES  9
Normal forms for CFG – Pumping Lemma for CFL – Closure Properties of CFL – Turing
Machines – Programming Techniques for TM.

UNIT V  UNDECIDABILITY  9
A language that is not Recursively Enumerable (RE) – An undecidable problem that is
RE – Undecidable problems about Turing Machine – Post’s Correspondence Problem –
The classes P and NP.

L: 45, T: 15, TOTAL: 60 PERIODS

TEXT BOOK:
1. J.E. Hopcroft, R. Motwani and J.D. Ullman, “Introduction to Automata Theory,

REFERENCES:
2. Thomas A. Sudkamp,” An Introduction to the Theory of Computer Science,
3. Raymond Greenlaw an H.James Hoover, “ Fundamentals of Theory of
5. J. Martin, “Introduction to Languages and the Theory of  computation”

CS2304  SYSTEM SOFTWARE  L T P C
3 1 0 4

AIM
To have an understanding of foundations of design of assemblers, loaders, linkers, and
macro processors.

OBJECTIVES
- To understand the relationship between system software and machine
architecture.
- To know the design and implementation of assemblers
- To know the design and implementation of linkers and loaders.
- To have an understanding of macroprocessors.
- To have an understanding of system software tools.
UNIT I INTRODUCTION
System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II ASSEMBLERS

UNIT III LOADERS AND LINKERS

UNIT IV MACRO PROCESSORS

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

L: 45, T: 15, TOTAL: 60 PERIODS

TEXT BOOK

REFERENCES
AIM:
To understand the concepts of object-oriented, event driven, and concurrent programming paradigms and develop skills in using these paradigms using Java.

UNIT I OBJECT-ORIENTED PROGRAMMING – FUNDAMENTALS 9

UNIT II OBJECT-ORIENTED PROGRAMMING – INHERITANCE 10

UNIT III EVENT-DRIVEN PROGRAMMING 10

UNIT IV GENERIC PROGRAMMING 8

UNIT V CONCURRENT PROGRAMMING 8

TOTAL:45 PERIODS

TEXT BOOK:

REFERENCES:
1. Programs using TCP Sockets (like date and time server & client, echo server & client, etc.)
2. Programs using UDP Sockets (like simple DNS)
3. Programs using Raw sockets (like packet capturing and filtering)
4. Programs using RPC
5. Simulation of sliding window protocols
6. Experiments using simulators (like OPNET)
7. Performance comparison of MAC protocols
8. Performance comparison of Routing protocols
9. Study of TCP/UDP performance

TOTAL: 45 PERIODS

Requirement for a batch of 30 students

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CS2308 SYSTEM SOFTWARE LAB L T P C 0 0 3 2

(Using C)

1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement pass one of a two pass assembler.
3. Implement pass two of a two pass assembler.
4. Implement a single pass assembler.
5. Implement a two pass macro processor
6. Implement a single pass macro processor.
7. Implement an absolute loader.
8. Implement a relocating loader.
9. Implement pass one of a direct-linking loader.
10. Implement pass two of a direct-linking loader.
11. Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.

12. Implement a symbol table with suitable hashing

(For loader exercises, output the snap shot of the main memory as it would be, after the loading has taken place)

**TOTAL: 45 PERIODS**

**Requirement for a batch of 30 students**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Description of Equipment</th>
<th>Quantity required</th>
<th>Quantity available</th>
<th>Deficiency %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Hardware – Pentium PC Desktops</td>
<td>30 Nos.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Software – Turbo C (Freely download)</td>
<td>Multiuser</td>
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<td></td>
</tr>
</tbody>
</table>

**CS2309 JAVA LAB L T P C 0 0 3 2**

1. Develop Rational number class in Java. Use JavaDoc comments for documentation. Your implementation should use efficient representation for a rational number, i.e. (500 / 1000) should be represented as (½).

2. Develop Date class in Java similar to the one available in java.util package. Use JavaDoc comments.

3. Implement Lisp-like list in Java. Write basic operations such as 'car', 'cdr', and 'cons'. If L is a list [3, 0, 2, 5], L.car() returns 3, while L.cdr() returns [0,2,5].

4. Design a Java interface for ADT Stack. Develop two different classes that implement this interface, one using array and the other using linked-list. Provide necessary exception handling in both the implementations.

5. Design a Vehicle class hierarchy in Java. Write a test program to demonstrate polymorphism.

6. Design classes for Currency, Rupee, and Dollar. Write a program that randomly generates Rupee and Dollar objects and write them into a file using object serialization. Write another program to read that file, convert to Rupee if it reads a Dollar, while leave the value as it is if it reads a Rupee.
7. Design a scientific calculator using event-driven programming paradigm of Java.

8. Write a multi-threaded Java program to print all numbers below 100,000 that are both prime and fibonacci number (some examples are 2, 3, 5, 13, etc.). Design a thread that generates prime numbers below 100,000 and writes them into a pipe. Design another thread that generates fibonacci numbers and writes them to another pipe. The main thread should read both the pipes to identify numbers common to both.

9. Develop a simple OPAC system for library using even-driven and concurrent programming paradigms of Java. Use JDBC to connect to a back-end database.

10. Develop multi-threaded echo server and a corresponding GUI client in Java.

11. [Mini-Project] Develop a programmer's editor in Java that supports syntax-highlighting, compilation support, debugging support, etc.

TOTAL: 45 PERIODS

Requirement for a batch of 30 students

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description of Equipment</th>
<th>Quantity Required</th>
<th>Quantity available</th>
<th>Deficiency %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>PC's</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>JUM &amp; J2SE (Freeware)</td>
<td>30</td>
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<tr>
<td>3.</td>
<td>MYSQL or any other DB</td>
<td>30</td>
<td></td>
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</tr>
</tbody>
</table>

CS2351      ARTIFICIAL INTELLIGENCE    L T P C
            3 0 0 3

AIM:
To learn the basics of designing intelligent agents that can solve general purpose problems, represent and process knowledge, plan and act, reason under uncertainty and can learn from experiences

UNIT I   PROBLEM SOLVING  9

UNIT II   LOGICAL REASONING  9
UNIT III  PLANNING  9
Planning with state-space search – partial-order planning – planning graphs – planning and acting in the real world

UNIT IV  UNCERTAIN KNOWLEDGE AND REASONING  9

UNIT V  LEARNING  9
Learning from observation - Inductive learning – Decision trees – Explanation based learning – Statistical Learning methods - Reinforcement Learning

TOTAL: 45 PERIODS

TEXT BOOK:

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

UNIT V  
CODE OPTIMIZATION  
9

TOTAL:45 PERIODS

TEXT BOOK:

REFERENCES:

CS2353  
OBJECT ORIENTED ANALYSIS AND DESIGN  
L T P C  
3 0 0 3

OBJECTIVES:
- To learn basic OO analysis and design skills through an elaborate case study
- To use the UML design diagrams
- To apply the appropriate design patterns

UNIT I  
Introduction to OOAD – What is OOAD? – What is UML? What are the United process(UP) phases - Case study – the NextGen POS system, Inception -Use case Modeling - Relating Use cases – include, extend and generalization.

UNIT II  
Elaboration - Domain Models - Finding conceptual classes and description classes – Associations – Attributes – Domain model refinement – Finding conceptual class hierarchies- Aggregation and Composition- UML activity diagrams and modeling
UNIT III 9
System sequence diagrams - Relationship between sequence diagrams and use cases
Logical architecture and UML package diagram – Logical architecture refinement - UML class diagrams - UML interaction diagrams

UNIT IV 9

UNIT V 9
UML state diagrams and modeling - Operation contracts- Mapping design to code -UML deployment and component diagrams

TOTAL : 45 PERIODS

TEXT BOOK :

REFERENCES:

CS2354 ADVANCED COMPUTER ARCHITECTURE L T P C
3 0 0 3

UNIT I 9
INSTRUCTION LEVEL PARALLELISM
ILP – Concepts and challenges – Hardware and software approaches – Dynamic scheduling – Speculation - Compiler techniques for exposing ILP – Branch prediction.

UNIT II 9
MULTIPLE ISSUE PROCESSORS
VLIW & EPIC – Advanced compiler support – Hardware support for exposing parallelism – Hardware versus software speculation mechanisms – IA 64 and Itanium processors – Limits on ILP.

UNIT III 9
MULTIPROCESSORS AND THREAD LEVEL PARALLELISM
UNIT IV  MEMORY AND I/O
Cache performance – Reducing cache miss penalty and miss rate – Reducing hit time –
Main memory and performance – Memory technology. Types of storage devices –
Buses – RAID – Reliability, availability and dependability – I/O performance measures –
Designing an I/O system.

UNIT V  MULTI-CORE ARCHITECTURES
Software and hardware multithreading – SMT and CMP architectures – Design issues –
Case studies – Intel Multi-core architecture – SUN CMP architecture - heterogenous

TOTAL : 45 PERIODS

TEXT BOOK:
1. John L. Hennessy and David A. Patterson, “Computer architecture – A quantitative

REFERENCES:
1. David E. Culler, Jaswinder Pal Singh, “Parallel computing architecture : A
   Delhi, 2003.

CS2357  OBJECT ORIENTED ANALYSIS AND DESIGN LAB

OBJECTIVES:
To develop a mini-project following the 12 exercises listed below.
1. To develop a problem statement.
2. Develop an IEEE standard SRS document. Also develop risk management and
   project plan (Gantt chart).
3. Identify Use Cases and develop the Use Case model.
4. Identify the business activities and develop an UML Activity diagram.
5. Identity the conceptual classes and develop a domain model with UML Class
   diagram.
6. Using the identified scenarios find the interaction between objects and represent
   them using UML Interaction diagrams.
7. Draw the State Chart diagram.
8. Identify the User Interface, Domain objects, and Technical services. Draw the
   partial layered, logical architecture diagram with UML package diagram notation.
9. Implement the Technical services layer.
10. Implement the Domain objects layer.
11. Implement the User Interface layer.
12. Draw Component and Deployment diagrams.
Suggested domains for Mini-project.
1. Passport automation system.
2. Book bank
3. Exam Registration
4. Stock maintenance system.
5. Online course reservation system
6. E-ticketing
7. Software personnel management system
8. Credit card processing
9. e-book management system
10. Recruitment system
11. Foreign trading system
12. Conference Management System
13. BPO Management System

Suggested Software Tools

GE2321 COMMUNICATION SKILLS LABORATORY L T P C
(Fifth / Sixth Semester) 0 0 4 2

Globalisation has brought in numerous opportunities for the teeming millions, with more focus on the students’ overall capability apart from academic competence. Many students, particularly those from non-English medium schools, find that they are not preferred due to their inadequacy of communication skills and soft skills, despite possessing sound knowledge in their subject area along with technical capability. Keeping in view their pre-employment needs and career requirements, this course on Communication Skills Laboratory will prepare students to adapt themselves with ease to the industry environment, thus rendering them as prospective assets to industries. The course will equip the students with the necessary communication skills that would go a long way in helping them in their profession.

OBJECTIVES:
- To equip students of engineering and technology with effective speaking and listening skills in English.
- To help them develop their soft skills and interpersonal skills, which will make the transition from college to workplace smoother and help them excel in their job.
- To enhance the performance of students at Placement Interviews, Group Discussions and other recruitment exercises.

I. PC based session (Weightage 40%) 24 periods
A. English Language Lab  
(18 Periods)

1. Listening Comprehension:  
   (6)  
   Listening and typing – Listening and sequencing of sentences – Filling in the blanks – Listening and answering questions.

2. Reading Comprehension:  
   (6)  
   Filling in the blanks – Close exercises – Vocabulary building – Reading and answering questions.

3. Speaking:  
   (6)  
   Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation)

B. Discussion of audio-visual materials  
(6 periods)  
(Samples are available to learn and practice)

1. Resume / Report Preparation / Letter Writing  
   (1)  
   Structuring the resume / report – Letter writing / Email Communication – Samples.

2. Presentation skills:  
   (1)  
   Elements of effective presentation – Structure of presentation – Presentation tools – Voice Modulation – Audience analysis – Body language – Video samples

3. Soft Skills:  
   (2)  
   Time management – Articulateness – Assertiveness – Psychometrics – Innovation and Creativity – Stress Management & Poise – Video Samples

4. Group Discussion:  
   (1)  

5. Interview Skills:  
   (1)  
   Kinds of interviews – Required Key Skills – Corporate culture – Mock interviews – Video samples.

<table>
<thead>
<tr>
<th>II. Practice Session (Weightage – 60%)</th>
<th>24 periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Resume / Report Preparation / Letter writing: Students prepare their own resume and report.</td>
<td>(2)</td>
</tr>
<tr>
<td>2. Presentation Skills: Students make presentations on given topics.</td>
<td>(8)</td>
</tr>
<tr>
<td>3. Group Discussion: Students participate in group discussions.</td>
<td>(6)</td>
</tr>
<tr>
<td>4. Interview Skills: Students participate in Mock Interviews</td>
<td>(8)</td>
</tr>
</tbody>
</table>

REFERENCES:  


**LAB REQUIREMENTS:**

1. Teacher console and systems for students.
2. English Language Lab Software
3. Career Lab Software

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**GE2321 COMMUNICATION SKILLS LABORATORY**

**Guidelines for the course**

1. A batch of 60 / 120 students is divided into two groups – one group for the PC-based session and the other group for the Class room session.

2. The English Lab (2 Periods) will be handled by a faculty member of the **English Department**. The Career Lab (2 Periods) may be handled by any competent teacher, **not necessarily from English Department**

3. **Record Notebook**: At the end of each session of English Lab, review exercises are given for the students to answer and the computer evaluated sheets are to be compiled as record notebook. Similar exercises for the career lab are to be compiled in the record notebook.

4. **Internal Assessment**: The 15 marks (the other 5 marks for attendance) allotted for the internal assessment will be based on the record notebook compiled by the candidate. 10 marks may be allotted for English Lab component and 5 marks for the Career Lab component.

5. **End semester Examination**: The end-semester examination carries 40% weightage for English Lab and 60% weightage for Career Lab.

Each candidate will have separate sets of questions assigned by the teacher using the teacher-console enabling PC-based evaluation for the 40% of marks allotted.

The Career Lab component will be evaluated for a maximum of 60% by a local examiner & an external examiner drafted from other Institutions, similar to any other lab examination conducted by Anna University.
LIST OF EXPERIMENTS
1. Create a web page with the following using HTML
   i) To embed an image map in a web page
   ii) To fix the hot spots
   iii) Show all the related information when the hot spots are clicked.
2. Create a web page with all types of Cascading style sheets.
3. Client Side Scripts for Validating Web Form Controls using DHTML
4. Write programs in Java to create applets incorporating the following features:
5. Create a color palette with matrix of buttons
   Set background and foreground of the control text area by selecting a color from
   color palette.
   In order to select Foreground or background use check box control as radio buttons
   To set background images
6. Write programs in Java using Servlets:
   To invoke servlets from HTML forms
   To invoke servlets from Applets
7. Write programs in Java to create three-tier applications using JSP and
   Databases
   • for conducting on-line examination.
   • for displaying student mark list. Assume that student information is available
     in a database which has been stored in a database server.
8. Programs using XML – Schema – XSLT/XSL
9. Programs using AJAX
10. Consider a case where we have two web Services- an airline service and a travel
    agent and the travel agent is searching for an airline. Implement this scenario using
    Web Services and Database.

TOTAL 15 + 45 = 60 PERIODS

TEXT BOOK:

REFERENCE:
UNIT III PRODUCTION AND COST ANALYSIS 10
Production function - Returns to scale - Production optimization - Least cost input - Isoquants - Managerial uses of production function.

UNIT IV PRICING 5
Determinants of Price - Pricing under different objectives and different market structures - Price discrimination - Pricing methods in practice.

UNIT V FINANCIAL ACCOUNTING (ELEMENTARY TREATMENT) 10
Balance sheet and related concepts - Profit & Loss Statement and related concepts - Financial Ratio Analysis - Cash flow analysis - Funds flow analysis - Comparative financial statements - Analysis & Interpretation of financial statements.

UNIT VI CAPITAL BUDGETING (ELEMENTARY TREATMENT) 5
Investments - Risks and return evaluation of investment decision - Average rate of return - Payback Period - Net Present Value - Internal rate of return.

TOTAL : 45 PERIODS

REFERENCES:

CS2401 COMPUTER GRAPHICS L T P C 3 0 0 3

UNIT I 2D PRIMITIVES 9
output primitives – Line, Circle and Ellipse drawing algorithms - Attributes of output primitives – Two dimensional Geometric transformation - Two dimensional viewing – Line, Polygon, Curve and Text clipping algorithms

UNIT II 3D CONCEPTS 9
Parallel and Perspective projections - Three dimensional object representation – Polygons, Curved lines, Splines, Quadric Surfaces,- Visualization of data sets - 3D transformations – Viewing -Visible surface identification.
UNIT III GRAPHICS PROGRAMMING
Color Models – RGB, YIQ, CMY, HSV – Animations – General Computer Animation, Raster, Keyframe - Graphics programming using OPENGL – Basic graphics primitives – Drawing three dimensional objects - Drawing three dimensional scenes

UNIT IV RENDERING
Introduction to Shading models – Flat and Smooth shading – Adding texture to faces – Adding shadows of objects – Building a camera in a program – Creating shaded objects – Rendering texture – Drawing Shadows.

UNIT V FRACTALS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCE:

CS2402 MOBILE AND PERVERSIVE COMPUTING

UNIT I MOBILE NETWORKS

UNIT II WIRELESS NETWORKS
Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services –Network – HiperLAN – Blue Tooth- Wi-Fi – WiMAX

UNIT III ROUTING

UNIT IV TRANSPORT AND APPLICATION LAYERS
UNIT V  PERVERSIVE COMPUTING  
Pervasive computing infrastructure-applications- Device Technology - Hardware, Human-machine Interfaces, Biometrics, and Operating systems– Device Connectivity – Protocols, Security, and Device Management- Pervasive Web Application architecture-Access from PCs and PDAs - Access via WAP

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS2403  DIGITAL SIGNAL PROCESSING  

UNIT I  SIGNALS AND SYSTEMS  

UNIT II  FREQUENCY TRANSFORMATIONS  

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

UNIT IV  FIR FILTER DESIGN  
Structures of FIR – Linear phase FIR filter – Filter design using windowing techniques, Frequency sampling techniques – Finite word length effects in digital Filters
UNIT V  APPLICATIONS

TEXT BOOKS:

REFERENCES:

CS2405  COMPUTER GRAPHICS LABORATORY  L T P C  0 0 3 2
1. Implementation of Bresenhams Algorithm – Line, Circle, Ellipse.
2. Implementation of Line, Circle and ellipse Attributes
3. Two Dimensional transformations - Translation, Rotation, Scaling, Reflection, Shear.
4. Composite 2D Transformations
5. Cohen Sutherland 2D line clipping and Windowing
6. Sutherland – Hodgeman Polygon clipping Algorithm
7. Three dimensional transformations - Translation, Rotation, Scaling
8. Composite 3D transformations
9. Drawing three dimensional objects and Scenes
10. Generating Fractal images

TOTAL : 60 PERIODS

CS2406  OPEN SOURCE LAB  L T P C  0 0 3 2
OBJECTIVE:
To expose students to FOSS environment and introduce them to use open source packages
1. Kernel configuration, compilation and installation : Download / access the latest kernel source code from kernel.org, compile the kernel and install it in the local system. Try to view the source code of the kernel
2. Virtualisation environment (e.g., xen, kqemu or lguest) to test an applications, new kernels and isolate applications. It could also be used to expose students to other alternate OSs like *BSD

3. Compiling from source: learn about the various build systems used like the auto* family, cmake, ant etc. instead of just running the commands. This could involve the full process like fetching from a cvs and also include autoconf, automake etc.,

4. Introduction to packet management system: Given a set of RPM or DEB, how to build and maintain, serve packages over http or ftp. and also how do you configure client systems to access the package repository.

5. Installing various software packages
   - Either the package is yet to be installed or an older version is existing. The student can practice installing the latest version. Of course, this might need internet access.
   - Install samba and share files to windows
   - Install Common Unix Printing System(CUPS)

6. Write userspace drivers using fuse -- easier to debug and less dangerous to the system (Writing full-fledged drivers is difficult at student level)

7. GUI programming: a sample programme – using Gambas since the students have VB knowledge. However, one should try using GTK or QT

8. Version Control System setup and usage using RCS, CVS, SVN

9. Text processing with Perl: simple programs, connecting with database e.g., MYSQL

10. Running PHP: simple applications like login forms after setting up a LAMP stack

11. Running Python: some simple exercise – e.g. Connecting with MySql database

12. Set up the complete network interface using ifconfig command like setting gateway, DNS, IP tables, etc.,

RESOURCES:
An environment like FOSS Lab Server (developed by NRCFOSS containing the various packages)
OR
Equivalent system with Linux distro supplemented with relevant packages

Note:
Once the list of experiments are finalised, NRCFOSS can generate full lab manuals complete with exercises, necessary downloads, etc. These could be made available on NRCFOSS web portal.

CS2028 UNIX INTERNALS

UNIT I
UNIT II
The Buffer Cache-Headers-Buffer Pool-Buffer Retrieval-Reading and Writing Disk Blocks - Advantages and Disadvantages. Internal Representation of Files-Inodes-Structure-Directories-Path Name to Inode-Super Block-Inode Assignment-Allocation of Disk Blocks -Other File Types.

UNIT III

UNIT IV

UNIT V
Memory Management Policies-Swapping-Demand Paging-a Hybrid System-I/O Subsystem-Driver Interfaces-Disk Drivers-Terminal Drivers.

TEXT BOOK:

REFERENCES:

MA2264 NUMERICAL METHODS L T P C
3 1 0 4

AIM:
With the present development of the computer technology, it is necessary to develop efficient algorithms for solving problems in science, engineering and technology. This course gives a complete procedure for solving different kinds of problems occur in engineering numerically.

OBJECTIVES:
At the end of the course, the students would be acquainted with the basic concepts in numerical methods and their uses are summarized as follows:
1. The roots of nonlinear (algebraic or transcendental) equations, solutions of large system of linear equations and eigen value problem of a matrix can be obtained numerically where analytical methods fail to give solution.
ii. When huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial to represent the data and to find the intermediate values.

iii. The numerical differentiation and integration find application when the function in the analytical form is too complicated or the huge amounts of data are given such as series of measurements, observations or some other empirical information.

iv. Since many physical laws are couched in terms of rate of change of one/two or more independent variables, most of the engineering problems are characterized in the form of either nonlinear ordinary differential equations or partial differential equations. The methods introduced in the solution of ordinary differential equations and partial differential equations will be useful in attempting any engineering problem.

UNIT I  SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS

UNIT II  INTERPOLATION AND APPROXIMATION
Lagrangian Polynomials – Divided differences – Interpolating with a cubic spline – Newton’s forward and backward difference formulas.

UNIT III  NUMERICAL DIFFERENTIATION AND INTEGRATION

UNIT IV  INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS

UNIT V  BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS
Finite difference solution of second order ordinary differential equation – Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

\[ L = 45, \text{ TOTAL: 45 PERIODS} \]

TEXT BOOKS:
REFERENCES:

CS2021 MULTICORE PROGRAMMING L T P C
3 0 0 3

UNIT I INTRODUCTION TO MULTIPROCESSORS AND SCALABILITY ISSUES 9

UNIT II PARALLEL PROGRAMMING 9

UNIT III OPENMP PROGRAMMING 9

UNIT IV MPI PROGRAMMING 9
MPI Model – collective communication – data decomposition – communicators and topologies – point-to-point communication – MPI Library.

UNIT V MULTITHREADED APPLICATION DEVELOPMENT 9
Algorithms, program development and performance tuning.

TOTAL: 45 PERIODS

TEXT BOOKS:
2. Michael J Quinn, Parallel programming in C with MPI and OpenMP, Tata Macgraw Hill, 2003.
REFERENCES:

CS2022 VISUAL PROGRAMMING

UNIT I

UNIT II
Controls – Modal and Modeless Dialog – Property – Data I/O – Sound – Timer

UNIT III
Memory management – SDI – MDI – MFC for Advanced windows user Interface – status bar and Toolbars – Tree view – List view – Threads

UNIT IV
ODBC – MFC Database classes – DAO - DLLs – Working with Images

UNIT V
COM Fundamentals – ActiveX control – ATL – Internet Programming

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
UNIT I  EMBEDDED COMPUTING

UNIT II  MEMORY AND INPUT / OUTPUT MANAGEMENT
Programming Input and Output – Memory system mechanisms – Memory and I/O devices and interfacing – Interrupts handling.

UNIT III  PROCESSES AND OPERATING SYSTEMS
Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Performance issues.

UNIT IV  EMBEDDED SOFTWARE
Programming embedded systems in assembly and C – Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers.

UNIT V  EMBEDDED SYSTEM DEVELOPMENT
Design issues and techniques – Case studies – Complete design of example embedded systems.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS2029  ADVANCED DATABASE TECHNOLOGY
UNIT I  RELATIONAL MODEL ISSUES

UNIT II  DISTRIBUTED DATABASES
UNIT III OBJECT ORIENTED DATABASES

UNIT IV EMERGING SYSTEMS
Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining - Web Databases – Mobile Databases- XML and Web Databases.

UNIT V CURRENT ISSUES

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

IT2043 KNOWLEDGE MANAGEMENT

UNIT I KNOWLEDGE MANAGEMENT

UNIT II KNOWLEDGE MANAGEMENT SYSTEM LIFE CYCLE

UNIT III CAPTURING KNOWLEDGE
UNIT IV KNOWLEDGE CODIFICATION  

UNIT V KNOWLEDGE TRANSFER AND SHARING  

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS2030 HIGH PERFORMANCE MICROPROCESSORS  

AIM
To do a detailed study of CISC and RISC principles, study the architecture & special features of the Pentium processors and typical RISC processors and to study the architecture of special purpose processors.

OBJECTIVES
- To study the principles of CISC
- To study the Pentium processor family
- To study the principles of RISC
- To study the architecture & special features of typical RISC processors.
- To study the architecture & function of special purpose processors.

UNIT I CISC PRINCIPLES  
UNIT II  PENTIUM PROCESSORS  10

UNIT III  RISC PRINCIPLES  10

UNIT IV  RISC PROCESSOR  8

UNIT V  SPECIAL PURPOSE PROCESSORS  8

TOTAL : 45 PERIODS

TEXT BOOK:

REFERENCES:
1. www.intel.com/products/server/processors/server/itanium2 (Unit V:EPIC)

CS2023  ADVANCED JAVA PROGRAMMING  L T P C  3 0 0 3

AIM:
To enable the students to design and develop enterprise strength distributed and multi-tier applications – Using Java Technology.

OBJECTIVES:
• To learn advanced Java programming concepts like interface, threads, Swings etc.
• To develop network programs in Java
• To understand Concepts needed for distributed and multi-tier applications
• To understand issues in enterprise applications development.
UNIT I  JAVA FUNDAMENTALS  

UNIT II  NETWORK PROGRAMMING IN JAVA  

UNIT III  APPLICATIONS IN DISTRIBUTED ENVIRONMENT  

UNIT IV  MULTI-TIER APPLICATION DEVELOPMENT  

UNIT V  ENTERPRISE APPLICATIONS  

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS2024  PARALLEL PROGRAMMING  
L T P C 3 0 0 3

UNIT I  PARALLEL PROGRAMMING  
UNIT II MESSAGE-PASSING PROGRAMMING 9
The message-passing model – the message-passing interface – MPI standard – basic concepts of MPI: MPI_Init, MPI_Comm_size, MPI_Comm_rank, MPI_Send, MPI_Recv, MPI_Finalize – timing the MPI programs: MPI_Wtime, MPI_Wtick – collective communication: MPI_Reduce, MPI_Barrier, MPI_Bcast, MPI_Gather, MPI_Scatter – case studies: the sieve of Eratosthenes, Floyd's algorithm, Matrix-vector multiplication

UNIT III SHARED-MEMORY PROGRAMMING 9

UNIT IV PARALLEL ALGORITHMS – I 9

UNIT V PARALLEL ALGORITHMS – II 9

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

IT2353 WEB TECHNOLOGY

UNIT I 9
UNIT II 9

UNIT III 9

UNIT IV 9

UNIT V 9


UNIT I  LINEAR PROGRAMMING:
Principal components of decision problem – Modeling phases – LP Formulation and
graphic solution – Resource allocation problems – Simplex method – Sensitivity
analysis.

UNIT II  DUALITY AND NETWORKS:
Definition of dual problem – Primal – Dual relation ships – Dual simplex methods – Post
optimality analysis – Transportation and assignment model shortest route problem.

UNIT III  INTEGER PROGRAMMING:
Cutting plan algorithm – Branch and bound methods, Multistage (Dynamic)
programming.

UNIT IV  CLASSICAL OPTIMISATION THEORY:
Jacobean methods – Lagrangian method – Kuhn – Tucker conditions – Simple
problems.

UNIT V  OBJECT SCHEDULING:
Network diagram representation – Critical path method – Time charts and resource
leveling – PERT.

TOTAL: 45 PERIODS

REFERENCES:

CS2032  DATA WAREHOUSING AND DATA MINING

UNIT I  DATA WAREHOUSING
Data warehousing Components –Building a Data warehouse — Mapping the Data
Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support –
Data Extraction, Cleanup, and Transformation Tools –Metadata.

UNIT II  BUSINESS ANALYSIS
Reporting and Query tools and Applications – Tool Categories – The Need for
Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need –
Multidimensional Data Model – OLAP Guidelines – Multidimensional versus
Multirelational OLAP – Categories of Tools – OLAP Tools and the Internet.
UNIT III DATA MINING

UNIT IV ASSOCIATION RULE MINING AND CLASSIFICATION
Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining Various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Backpropagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods - Prediction

UNIT V CLUSTERING AND APPLICATIONS AND TRENDS IN DATA MINING

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS2033 REAL TIME SYSTEMS
L T P C
3 0 0 3

UNIT I INTRODUCTION
UNIT II  PROGRAMMING LANGUAGES AND TOOLS  9

UNIT III  REAL TIME DATABASES  9
Real time Databases - Basic Definition, Real time Vs General Purpose Databases, Main Memory Databases, Transaction priorities, Transaction Aborts, Concurrency Control Issues, Disk Scheduling Algorithms, Two-phase Approach to improve Predictability, Maintaining Serialization Consistency, Databases for Hard Real Time systems.

UNIT IV  COMMUNICATION  9

UNIT V  EVALUATION TECHNIQUES  9

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS2034  TCP/IP DESIGN AND IMPLEMENTATION  L T P C
3 0 0 3

UNIT I  INTRODUCTION  9
UNIT II TCP

UNIT III IP IMPLEMENTATION

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

UNIT V TCP IMPLEMENTATION II

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS2041 C# AND .NET FRAMEWORK

UNIT I

UNIT II

UNIT III
UNIT IV

UNIT V

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

IT2352 CRYPTOGRAPHY AND NETWORK SECURITY L T P C
3 0 0 3

UNIT I

UNIT II

UNIT III

UNIT IV
UNIT V

TEXT BOOKS:

REFERENCES:

CS2035
NATURAL LANGUAGE PROCESSING
L T P C
3 0 0 3

UNIT I
Introduction – Models and Algorithms - The Turing Test - Regular Expressions Basic Regular Expression Patterns - Finite State Automata - Regular Languages and FSAs – Morphology - Inflectional Morphology - Derivational Morphology - Finite-State Morphological Parsing - Combining an FST Lexicon and Rules - Porter Stemmer

UNIT II
N-grams Models of Syntax - Counting Words - Unsmoothed N-grams – Smoothing - Backoff - Deleted Interpolation – Entropy - English Word Classes - Tagsets for English - Part of Speech Tagging - Rule-Based Part of Speech Tagging - Stochastic Part of Speech Tagging - Transformation-Based Tagging -

UNIT III

UNIT IV

UNIT V

TOTAL: 45 PERIODS
TEXT BOOKS:
1. D. Jurafsky and J. Martin “Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition”,
2. C. Manning and H. Schutze, “Foundations of Statistical Natural Language Processing”,

REFERENCE:

IT2061 SYSTEM MODELING AND SIMULATION L T P C
3 0 0 3

UNIT I INTRODUCTION TO SIMULATION
9
Introduction – Simulation Terminologies- Application areas – Model Classification – Types of Simulation- Steps in a Simulation study- Concepts in Discrete Event Simulation - Simulation Examples

UNIT II MATHEMATICAL MODELS
9

UNIT III ANALYSIS OF SIMULATION DATA
9

UNIT IV VERIFICATION AND VALIDATION
9
Model 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
9
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

TEXT BOOKS:
REFERENCES:

IT2024 USER INTERFACE DESIGN L T P C
3 0 0 3

UNIT I INTRODUCTION

UNIT II HUMAN COMPUTER INTERACTION

UNIT III WINDOWS

UNIT IV MULTIMEDIA

UNIT V WINDOWS LAYOUT– TEST

TOTAL:45 PERIODS

TEXT BOOKS:

REFERENCE:
UNIT I  INTRODUCTION

UNIT II  TQM PRINCIPLES
Leadership – Strategic quality planning, Quality statements - Customer focus – Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement – PDSA 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

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
UNIT I ELEMENTARY TCP SOCKETS

UNIT II APPLICATION DEVELOPMENT

UNIT III SOCKET OPTIONS, ELEMENTARY UDP SOCKETS

UNIT IV ADVANCED SOCKETS

UNIT V SIMPLE NETWORK MANAGEMENT

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I INTRODUCTION

UNIT II TEST CASE DESIGN

UNIT III LEVELS OF TESTING

UNIT IV TEST MANAGEMENT

UNIT V CONTROLLING AND MONITORING

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

IT2401 SERVICE ORIENTED ARCHITECTURE L T P C
3 0 0 3

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

UNIT I 9

UNIT II 9
Web services – Service descriptions – Messaging with SOAP – Message exchange Patterns – Coordination – Atomic Transactions – Business activities – Orchestration – Choreography - Service layer abstraction – Application Service Layer – Business Service Layer – Orchestration Service Layer

UNIT III 9

UNIT IV 9
SOA platform basics – SOA support in J2EE – Java API for XML-based web services (JAX-WS) - Java architecture for XML binding (JAXB) – Java API for XML Registries (JAXR) - Java API for XML based RPC (JAX-RPC)- Web Services Interoperability Technologies (WSIT) - SOA support in .NET – Common Language Runtime - ASP.NET web forms – ASP.NET web services – Web Services Enhancements (WSE).

UNIT V 9
WS-BPEL basics – WS-Coordination overview - WS-Choreography, WS-Policy, WS-Security

TOTAL: 45 PERIODS
TEXT BOOK:

REFERENCES:

CS2040 ADVANCED OPERATING SYSTEMS

AIM
To understand the principles in the design of modern operating systems, distributed and multiprocessor operating systems

OBJECTIVES
- To get a comprehensive knowledge of the architecture of distributed systems.
- To understand the deadlock and shared memory issues and their solutions in distributed environments.
- To know the security issues and protection mechanisms for distributed environments.
- To get a knowledge of multiprocessor operating system and database operating systems.

UNIT I

UNIT II
UNIT III

UNIT IV

UNIT-V
Multiprocessor operating systems - basic multiprocessor system architectures – inter connection networks for multiprocessor systems – caching – hypercube architecture. Multiprocessor Operating System - structures of multiprocessor operating system, operating system design issues- threads- process synchronization and scheduling.


TOTAL : 45 PERIODS

TEXT BOOK:
1. Mukesh Singhal, Niranjan G.Shivaratri, "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", TMH, 2001

REFERENCES:
1. Andrew S.Tanenbaum, "Modern operating system", PHI, 2003
UNIT I  WIRELESS COMMUNICATION  7
Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation - MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks

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

UNIT III  MOBILE COMMUNICATION SYSTEMS  11

UNIT IV  MOBILE NETWORK AND TRANSPORT LAYERS  9

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

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V
Case Studies on – Patents (Basumati rice, turmeric, Neem, etc.) – Copyright and related rights – Trade Marks – Industrial design and Integrated circuits – Geographic indications – Protection against unfair competition.

TOTAL: 45 PERIDOS

TEXT BOOKS:

REFERENCES:

CS2051
GRAPH THEORY
UNIT I
INTRODUCTION
UNIT II  TREES, CONNECTIVITY, PLANARITY  9
Spanning trees – Fundamental Circuits – Spanning Trees in a Weighted Graph – Cut
Sets – Properties of Cut Set – All Cut Sets – Fundamental Circuits and Cut Sets –
Connectivity and Separability – Network flows – 1-Isomorphism – 2-Isomorphism –
Combinational and Geometric Graphs – Planer Graphs – Different Representation of a
Planer Graph.

UNIT III  MATRICES, COLOURING AND DIRECTED GRAPH  9
Incidence matrix – Submatrices – Circuit Matrix – Path Matrix – Adjacency Matrix –
Chromatic Number – Chromatic partitioning – Chromatic polynomial – Matching –
Covering – Four Color Problem – Directed Graphs – Types of Directed Graphs –
Digraphs and Binary Relations – Directed Paths and Connectedness – Euler Graphs –
Adjacency Matrix of a Digraph.

UNIT IV  ALGORITHMS  9
Algorithms: Connectedness and Components – Spanning tree – Finding all Spanning
Trees of a Graph – Set of Fundamental Circuits – Cut Vertices and Separability –
Directed Circuits.

UNIT V  ALGORITHMS  9

TOTAL: 45 PERIODS

TEXT BOOK:
1. Narsingh Deo, “Graph Theory: With Application to Engineering and Computer

REFERENCE:
2003.

IT2042  INFORMATION SECURITY  L T P C
3 0 0 3

AIM
To study the critical need for ensuring Information Security in Organizations

OBJECTIVES
• To understand the basics of Information Security
• To know the legal, ethical and professional issues in Information Security
• To know the aspects of risk management
• To become aware of various standards in this area
• To know the technological aspects of Information Security
UNIT I  INTRODUCTION  9
History, What is Information Security?, Critical Characteristics of Information, NSTISSC
Security Model, Components of an Information System, Securing the Components,
Balancing Security and Access, The SDLC, The Security SDLC

UNIT II  SECURITY INVESTIGATION  9
Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional
Issues

UNIT III  SECURITY ANALYSIS  9
Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV  LOGICAL DESIGN  9
17799/BS 7799, NIST Models, VISA International Security Model, Design of Security
Architecture, Planning for Continuity

UNIT V  PHYSICAL DESIGN  9
Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control
Devices, Physical Security, Security and Personnel

TOTAL: 45 PERIODS

TEXT BOOK:
Publishing House, New Delhi, 2003

REFERENCES:
2. Stuart Mc Clure, Joel Scrambray, George Kurtz, “Hacking Exposed”, Tata McGraw-
Hill, 2003

CS2060  HIGH SPEED NETWORKS  L T P C
                                                3 0 0 3

UNIT I  HIGH SPEED NETWORKS  9
Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture,
ATM logical Connection – ATM Cell – ATM Service Categories – AAL. High Speed
LAN’s: Fast Ethernet – Gigabit Ethernet– Fibre Channel – Wireless LAN’s, WiFi and
WiMax Networks applications, requirements – Architecture of 802.11.

UNIT II  CONGESTION AND TRAFFIC MANAGEMENT  8
Queueing Analysis – Queuing Models – Single Server Queues – Effects of Congestion –
Congestion Control – Traffic Management – Congestion Control in Packet Switching
Networks – Frame Relay Congestion Control.
UNIT III  TCP AND ATM CONGESTION CONTROL  12
Exponential RTO backoff – KARN’s Algorithm – Window management – Performance of
TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes –
Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate
control, RM cell formats – ABR Capacity allocations – GFR traffic management.

UNIT IV  INTEGRATED AND DIFFERENTIATED SERVICES  8
Integrated Services Architecture – Approach, Components, Services- Queueing Discipline –

UNIT V  PROTOCOLS FOR QOS SUPPORT  8
Protocol Architecture – Data Transfer Protocol– RTCP.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
2. Irvan Pepelnjk, Jim Guichard, Jeff Apcar, “MPLS and VPN architecture”,
3. Abhijit S. Pandya, Ercan Sea, “ATM Technology for Broad Band

CS2061  ROBOTICS  L T P C
3 0 0 3

UNIT I  SCOPE OF ROBOTS  4
The scope of industrial Robots - Definition of an industrial robot - Need for industrial
robots - applications.

UNIT II  ROBOT COMPONENTS  9
Fundamentals opf Robot Technology - Automation and Robotics - Robot anatomy -
Work volume - Precision of movement - End effectors - Sensors.

UNIT III  ROBOT PROGRAMMING  9
Robot Programming - Methods - interlocks textual languages. Characteristics of Robot
level languages, characteristic of task level languages.

UNIT IV  ROBOT WORK CELL  9
Robot Cell Design and Control - Remote Center compliance - Safety in Robotics.
UNIT V FUTURE TRENDS

Advanced robotics, Advanced robotics in Space - Specific features of space robotics systems - long-term technical developments, Advanced robotics in under - water operations. Robotics Technology of the Future - Future Applications.

TOTAL : 45 PERIODS

TEXT BOOK

REFERENCES

CS2053 SOFT COMPUTING L T P C 3 0 0 3

UNIT I Fuzzy Set Theory 10

UNIT II Optimization 8

UNIT III Artificial Intelligence 10
UNIT IV  NEURO FUZZY MODELING

UNIT V  APPLICATIONS OF COMPUTATIONAL INTELLIGENCE

TEXT BOOKS:

REFERENCES:

IT2023  DIGITAL IMAGE PROCESSING
Aim:
The aim is to inculcate a basic training in the processing of images for practical applications in the domain of medical, remoting sessions and in general.

Objectives:
- To introduce basic concepts in acquiring, storage and Process of images
- To introduce for enhancing the quality of images.
- To introduce techniques for extraction and processing of region of interest
- To introduce case studies of Image Processing.

UNIT I  FUNDAMENTALS OF IMAGE PROCESSING
UNIT II IMAGE ENHANCEMENT 9

UNIT III IMAGE SEGMENTATION AND FEATURE ANALYSIS 9

UNIT IV MULTI RESOLUTION ANALYSIS AND COMPRESSIONS 9

UNIT V APPLICATIONS OF IMAGE PROCESSING 9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT IV  SOFTWARE QUALITY PROGRAM  9
Software Quality Program Concepts – Establishment of a Software Quality Program –

UNIT V  SOFTWARE QUALITY ASSURANCE STANDARDIZATION  9
Software Standards–ISO 9000 Quality System Standards - Capability Maturity Model
and the Role of SQA in Software Development Maturity – SEI CMM Level 5 –
Comparison of ISO 9000 Model with SEI’s CMM

TEXT BOOKS:
   House, Pvt, Ltd., New Delhi.(UNIT III to V)

REFERENCES:
   Artech House Publishers 2007
   Science International, Ltd, 2004

IT2403  SOFTWARE PROJECT MANAGEMENT  L T P C
3 0 0 3

UNIT I  INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT  9
Project Definition – Contract Management – Activities Covered By Software Project
Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II  PROJECT EVALUATION  9
Strategic Assessment – Technical Assessment – Cost Benefit Analysis –Cash Flow

UNIT III  ACTIVITY PLANNING  9
Objectives – Project Schedule – Sequencing and Scheduling Activities –Network
Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project
Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of
Control.

UNIT IV  MONITORING AND CONTROL  9
Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring –
Earned Value – Prioritzing Monitoring – Getting Project Back To Target – Change
Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract
UNIT V  MANAGING PEOPLE AND ORGANIZING TEAMS  9
Introduction – Understanding Behavior – Organizational Behaviour:A Background –
Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation –

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS2056  DISTRIBUTED SYSTEMS  

UNIT I  9
Characterization of Distributed Systems-Introduction-Examples-Resource Sharing and
the Web-Challenges.
System Models-Architectural-Fundamental.
Interprocess Communication-Introduction-API for Internet protocols-External data
representation and marshalling--Client-server communication-Group communication-
Case study: Interprocess Communication in UNIX.

UNIT II  9
Distributed Objects and Remote Invocation-Introduction-Communication between
distributed objects-Remote procedure calls-Events and notifications-Case study: Java
RMI.
Operating System Support-Introduction-OS layer-Protection-Processes and threads-
Communication and invocation OS architecture.

UNIT III  9
Distributed File Systems-Introduction-File service architecture-Case Study:Sun Network
File System-Enhancements and further developments.
Name Services-Introduction-Name Services and the Domain Name System-Directory
Services-Case Study: Global Name Service.

UNIT IV  9
Time and Global States-Introduction-Clocks, events and process states-Synchronizing
physical clocks-Logical time and logical clocks-Global states-Distributed debugging.
Coordination and Agreement-Introduction-Distributed mutual exclusion-Elections-
Multicast communication-Consensus and related problems.
UNIT V 9
Distributed Shared Memory-Introduction-Design and implementation issues-Sequential consistency and Ivy case study Release consistency and Munin case study-Other consistency models.
CORBA Case Study- Introduction-CORBA RMI-CORBA services.

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

CS2062 QUANTUM COMPUTING L T P C
3 0 0 3

UNIT I FOUNDATION 9

UNIT II QUBITS AND QUANTUM MODEL OF COMPUTATION 9

UNIT III QUANTUM ALGORITHMS – I 9

UNIT IV QUANTUM ALGORITHMS – II 9
UNIT V QUANTUM COMPUTATIONAL COMPLEXITY AND ERROR CORRECTION


TEXT BOOK:

REFERENCE:

CS2057 KNOWLEDGE BASED DECISION SUPPORT SYSTEM L T P C
3 0 0 3

UNIT I
Decision Making and computerized support: Management support systems. Decision making systems modeling- support.

UNIT II

UNIT III
Collaboration, Communicate Enterprise Decision Support System & Knowledge management – Collaboration Com Technologies Enterprise information system – knowledge management.

UNIT IV

UNIT V

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:

CS 2063
GRID COMPUTING
L T P C
3 0 0 3

UNIT I CONCEPTS AND ARCHITECTURE
Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing-
Anatomy and Physiology of Grid-Review of Web Services-OGSA-WSRF.

UNIT II GRID MONITORING
Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- Grid
ICE – JAMM -MDS-Network Weather Service-R-GMA-Other Monitoring Systems-
Ganglia and GridMon

UNIT III GRID SECURITY AND RESOURCE MANAGEMENT
Scheduling and Resource Management-Scheduling Paradigms- Working principles of
Scheduling - A Review of Condor, SGE, PBS and LSF-Grid Scheduling with QoS.

UNIT IV DATA MANAGEMENT AND GRID PORTALS
Data Management-Categories and Origins of Structured Data-Data Management
Challenges-Architectural Approaches-Collective Data Management Services-Federation

UNIT V GRID MIDDLEWARE
List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit
and gLite - Architecture, Components and Features.

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:
1. Ian Foster & Carl Kesselman, The Grid 2 – Blueprint for a New Computing
Infrastrcuture , Morgan Kaufman – 2004
CS2064 AGENT BASED INTELLIGENT SYSTEMS L T P C 3 0 0 3

UNIT I INTRODUCTION 9

UNIT II KNOWLEDGE REPRESENTATION AND REASONING 9
Logical Agents-First order logic-First Order Inference-Unification-Chaining- Resolution Strategies-Knowledge Representation-Objects-Actions-Events

UNIT III PLANNING AGENTS 9

UNIT IV AGENTS AND UNCERTAINTY 9

UNIT V HIGHER LEVEL AGENTS 9
Knowledge in Learning-Relevance Information-Statistical Learning Methods-Reinforcement Learning-Communication-Formal Grammar-Augmented Grammars-Future of AI.

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

GE2025 PROFESSIONAL ETHICS IN ENGINEERING L T P C 3 0 0 3

UNIT I ENGINEERING ETHICS 9

UNIT II ENGINEERING AS SOCIAL EXPERIMENTATION 9
Engineering as Experimentation – Engineers as responsible Experimenters – Research Ethics - Codes of Ethics – Industrial Standards - A Balanced Outlook on Law – The Challenger Case Study
UNIT III ENGINEER’S RESPONSIBILITY FOR SAFETY


UNIT IV RESPONSIBILITIES AND RIGHTS


UNIT V GLOBAL ISSUES


TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

GE2023 FUNDAMENTALS OF NANOSCIENCE

UNIT I INTRODUCTION

Nanoscale Science and Technology- Implications for Physics, Chemistry, Biology and Engineering-Classifications of nanostructured materials- nano particles- quantum dots, nanowires-ultra-thinfilms-multilayered materials. Length Scales involved and effect on properties: Mechanical, Electronic, Optical, Magnetic and Thermal properties. Introduction to properties and motivation for study (qualitative only).

UNIT II PREPARATION METHODS

Bottom-up Synthesis-Top-down Approach: Precipitation, Mechanical Milling, Colloidal routes, Self-assembly, Vapour phase deposition, MOCVD, Sputtering, Evaporation, Molecular Beam Epitaxy, Atomic Layer Epitaxy, MOMBE.
UNIT III  PATTERNING AND LITHOGRAPHY FOR NANOSCALE DEVICES  5
Introduction to optical/UV electron beam and X-ray Lithography systems and processes, Wet etching, dry (Plasma/reactive ion) etching, Etch resists-dip pen lithography

UNIT IV  PREPARATION ENVIRONMENTS  10
Clean rooms: specifications and design, air and water purity, requirements for particular processes, Vibration free environments: Services and facilities required. Working practices, sample cleaning, Chemical purification, chemical and biological contamination, Safety issues, flammable and toxic hazards, biohazards.

UNIT V  CHARACTERISATION TECHNIQUES  10
X-ray diffraction technique, Scanning Electron Microscopy - environmental techniques, Transmission Electron Microscopy including high-resolution imaging, Surface Analysis techniques- AFM, SPM, STM, SNOM, ESCA, SIMS-Nanoindentation

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
1. G Timp (Editor), Nanotechnology, AIP press/Springer, 1999

GE2072  INDIAN CONSTITUTION AND SOCIETY  L T P C
3 0 0 3


UNIT II  Union Government – Structures of the Union Government and Functions – President – Vice President – Prime Minister – Cabinet – Parliament – Supreme Court of India – Judicial Review.

UNIT IV  
Indian Federal System – Center – State Relations – President’s Rule – Constitutional Amendments – Constitutional Functionaries - Assessment of working of the Parliamentary System in India.

UNIT V  
Society : Nature, Meaning and definition; Indian Social Structure; Caste, Religion, Language in India; Constitutional Remedies for citizens – Political Parties and Pressure Groups; Right of Women, Children and Scheduled Castes and Scheduled Tribes and other Weaker Sections.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

IT2033  
BIO INFORMATICS  
L T P C  3 0 0 3

UNIT I  
Introduction to molecular biology – the genetic material – gene structure – protein structure – chemical bonds – molecular biology tools – genomic information content

UNIT II  

UNIT III  
UNIT IV  9

UNIT V  9

TOTAL: 45 PERIODS

TEXT BOOK:

REFERENCES:

IT2064  SPEECH PROCESSING  L T P C
3  0  0  3

UNIT I  MECHANICS OF SPEECH  9

UNIT II  TIME DOMAIN METHODS FOR SPEECH PROCESSING  9

UNIT III  FREQUENCY DOMAIN METHOD FOR SPEECH PROCESSING  9
UNIT IV  LINEAR PREDICTIVE ANALYSIS OF SPEECH  

UNIT V  APPLICATION OF SPEECH & AUDIO SIGNAL PROCESSING  

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES: