REGULATIONS – 2013

DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING

CURRICULUM AND SYLLABI OF
I & II YEAR
B.E. – COMPUTER SCIENCE AND ENGINEERING
COLLEGE VISION

• Transforming lives through quality Education and research with human values

COLLEGE MISSION

• To maintain excellent infrastructure and highly qualified and dedicated faculty

• To provide a conducive learning environment with an ambience of humanity, wisdom, creativity and team spirit

• To promote the values of ethical behavior and commitment to the society

• To partner with academic, industrial and government entities to attain collaborative research
VISION

• To produce globally competent, innovative and socially responsible computer professionals

MISSION

• To provide world-class teaching - learning and research facilities.

• To stimulate students’ logical thinking, creativity, and communication skills effectively.

• To cultivate awareness about emerging trends through self-initiative.

• To instil a sense of societal and ethical responsibilities.

• To collaborate with industries and government organizations.

Program Educational Objectives (PEO)

• Accomplish their professional career and/or pursue higher education by applying knowledge of computer science and engineering.

• Exhibit their technical skills to analyze and design appropriate solutions with social consciousness and ethical values.

• Adapt themselves to organizational needs by learning advanced technologies.
Program Outcomes (PO)

1. An ability to apply acquired knowledge of mathematics, science and computer science and engineering to solve engineering problems.

2. An ability to identify, formulate and analyze engineering problems.

3. An ability to design and implement a system, process, component or program to meet desired needs, within realistic constraints such as culture, society, environment, health and safety.

4. An ability to conduct investigations of complex problems to reach valid conclusions and to research the contemporary issues.

5. An ability to use appropriate skills, modern tools and techniques necessary for computing and engineering practices.

6. An ability to demonstrate professional responsibilities pertaining to computer science and engineering by the analysis of societal, health, safety, legal and cultural issues.

7. An ability to produce engineering solutions in global and societal context and demonstrate the need for sustainable development.

8. Apply ethical principles, professional ethics and norms of computer engineering practices.

9. An ability to function effectively as an individual and in multi-disciplinary teams.

10. An ability to prepare technical reports and make presentations for the effective delivery of technical information.

11. Recognition of the need for an ability to engage in lifelong learning.

12. An ability to incorporate appropriate economics and business practices for project, risk and change management.
### REGULATIONS 2013 – CURRICULUM AND SYLLABI

#### B.E. – COMPUTER SCIENCE AND ENGINEERING

**SEMESTER I** (Common to all B.E. / B.Tech., Degree Programmes)

<table>
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*NEC (An Autonomous Institution)*
## SEMESTER II

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SH100 TECHNICAL ENGLISH – I
(Common to all B.E. / B.Tech., Degree Programmes)

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COURSE OUTCOMES
The Student will
• apply basic grammar in Writing and Speaking.
• prepare formal Letter Writings.
• come out with proper pronunciation.
• speak confidently in interactions.
• develop interest to read any article.

UNIT I
Language Focus: Technical Vocabulary, Word Formation, Concord, Tense (Present).
Writing: Leave Application Letter, Paragraph writing.
Listening: Listening to correct pronunciation of words.

UNIT II
Language Focus: Words often misspelled, Articles, Tense (Past)
Writing: Permission letters (In-plant training/Seminar/Workshop), Chart description.
Listening: Listening to the Sentences with correct stress and Intonation.
Speaking: Situational Conversations.

UNIT III
Language Focus: Compound nouns, Tense (Future), Preposition, Comparative Adjectives.
Listening: Listening to the conversations.
Speaking: One minute speech.

UNIT IV
Language Focus: Modal verbs, Gerund, Infinitives, Voice.
Writing: Writing Instructions, Letters to Editor.
Listening: Listening to the different Tonal Expressions.
Speaking: Giving Opinions.

UNIT V
Language Focus: ‘If’ Conditionals, ‘Wh’ questions, Question Tags.
Writing: Reading and Note - taking
Speaking: Group Discussion.
Reading: ERC, one word questions from the suggested book.

SUGGESTED ACTIVITIES
2. Exercises on gap filling and correction of errors on Concord (Subject – Verb Agreement).
3. Gap filling exercises using the appropriate Tense forms.
4. Exercises on transferring information from Graph to Text – Bar charts, Flow charts.
5. Making sentences using Modal verbs to express probability, compulsion, etc.
6. Exercises on Writing Instructions.
7. Exercises on framing Questions.
8. Other relevant classroom activities.

L: 45 T: 15 TOTAL: 60 PERIODS
BOOK SUGGESTED FOR READING

REFERENCES
COURSE OUTCOMES

- Ability to find inverse and integral powers of matrices and to perform transformations of matrices.
- Ability to find the evolutes of various curves.
- Ability to solve ordinary and partial differential equations.
- Ability to obtain constrained maxima and minima.

UNIT I  MATRICES  12
Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties (excluding proofs); Cayley – Hamilton theorem (excluding proof) – Inverse and integral powers of a matrix using Cayley – Hamilton theorem; Diagonalisation of a matrix by orthogonal transformation; Quadratic form – Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT II  DIFFERENTIAL CALCULUS  12
Curvature in cartesian, parametric and polar forms; Centre, radius and circle of curvature; Evolutes.

UNIT III  FUNCTIONS OF SEVERAL VARIABLES  12
Partial derivatives; Total derivatives; Differentiation of implicit functions; Jacobians; Maxima and Minima - Method of Lagrangian multipliers.

UNIT IV  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 V  PARTIAL DIFFERENTIAL EQUATIONS  12
Formation of partial differential equations; Lagrange’s linear equations; Solutions of standard types of first order partial differential equations; Linear partial differential equations of second and higher order with constant coefficients.

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS


REFERENCES

SH102  APPLIED PHYSICS  
(Common to all B.E. / B.Tech., Degree Programmes) 

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COURSE OUTCOMES
The students will be able to
• gain knowledge on the properties of matter and hydrodynamics.
• study and apply the ultrasonic methods for industrial and medical field.
• understand Lasers and to identify the appropriate Laser technique for industrial and medical field.
• understand the different types, fabrication, losses of optical fibers and the applications of fiber optics in communication and instrumentation.
• understand the physical properties of photons and electrons and to study the different Electron Microscopes.

UNIT I  PROPERTIES OF MATTER AND HYDRODYNAMICS 9
Properties of Matter
Stress, Strain, Hooke’s law; Types of moduli of elasticity; Torsional pendulum – Determination of Rigidity modulus of a wire; Bending of beams – Expression for bending moment – Measurement of Young’s modulus by uniform and Non-uniform bending – I Shaped girders.

Hydrodynamics
Stream line flow, Turbulent flow, Poiseuille’s formula for flow of liquid through a capillary tube, Determination of coefficient of viscosity of a liquid.

UNIT II  ULTRASONICS 9

UNIT III  LASERS 9
Principle of spontaneous emission and stimulated emission, Population inversion, Pumping, Einstein’s A and B coefficients – derivation; Types of Lasers - CO2 Laser, Nd-YAG Laser, Semiconductor Laser (Homojunction); Determination of wavelength of Laser using grating and Particle size; Applications of Lasers: Industrial applications – Welding, Cutting and Heat treatment; Medical applications; Holography (construction and reconstruction).

UNIT IV  FIBER OPTICS AND ITS APPLICATIONS 9
Principle and propagation of light in optical fibers; Numerical aperture and Acceptance angle; Types of optical fibers – material, refractive index and mode; Double crucible technique of fiber drawing; Splicing – fusion splicing; Loss in optical fiber – attenuation, dispersion and bending; Fiber optical communication system (Block diagram); Advantages and Applications of optical fiber; Fiber optic sensors – temperature and displacement; Endoscope.

UNIT V  QUANTUM PHYSICS AND MICROSCOPY 9
Black body radiation – Planck’s theory (derivation) – Deduction of Wien’s displacement law and Rayleigh Jean’s Law from Planck’s theory; Photoelectric effect – Law of Photoelectric effect – Photoelectric equation; Matter Waves – De Broglie wavelength - Schrodinger’s wave equation – time independent and time dependent equations – Particle in one dimensional box; Heisenberg’s Uncertainty principle; Linear Harmonic oscillator; Electron microscope – scanning electron microscope – transmission electron microscope.

TOTAL: 45 PERIODS
TEXT BOOKS

REFERENCES
SH103 ENGINEERING CHEMISTRY  
(Common to all B.E. / B.Tech., Degree Programmes)  

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COURSE OUTCOMES  
The students will be able to  
- select suitable water treatment techniques for industrial and domestic purpose.  
- acquire knowledge of electrochemistry.  
- apply the contextual knowledge of adsorption techniques for industrial applications.  
- synthesize polymers for domestic and industrial applications.  
- understand the knowledge of nano materials for their applications in Science and Engineering.  

UNIT I WATER TREATMENT  
9  

UNIT II ELECTRO ANALYTICAL TECHNIQUES  
9  
Electrode potential: definition, measurement of electrode potential, Nernst equation – problems; EMF: definition, measurement of EMF – Pogendorff’s method; reference electrode: standard hydrogen electrode, calomel electrode, glass electrode – measurement of pH using glass electrode; CO₂ sensing electrode; conductometric titrations: acid-base titration (HCl vs NaOH); potentiometric titrations: redox titration (Fe²⁺ vs K₂Cr₂O₇), precipitation titration (Ag⁺ vs NaCl).  

UNIT III CATALYSIS AND SURFACE PHENOMENA  
9  
Types of catalysis – homogeneous catalysis – heterogeneous catalysis, mechanism of catalytic action - contact theory, catalytic promoters, catalytic poison; enzyme catalysis: Michaelis-Menton equation; adsorption: definition, types – physical adsorption – chemical adsorption – differences between physical and chemical adsorption; adsorption isotherms: definition, Freundlich and Langmuir adsorption isotherms, applications of adsorption.  

UNIT IV ENGINEERING POLYMERS  
9  

UNIT V NANO MATERIALS  
9  
Nanoparticles: definition, carbon nanotubes (CNT), types of carbon nano tubes – single walled and multi walled carbon nanotubes – fullerene; synthesis of carbon nanotubes: chemical vapour deposition – laser ablation – arc-discharge method; properties of CNT: mechanical, electrical, thermal and optical properties; applications of carbon nanotubes in chemical field, medicinal field, mechanical field and current applications.  

TOTAL: 45 PERIODS  

TEXT BOOKS  
REFERENCES
SH104  FUNDAMENTALS OF COMPUTING AND PROGRAMMING IN C
(Common to all B.E. / B.Tech., Degree Programmes)

COURSE OUTCOMES
• Learn the major components of a computer system.
• Formulate the algorithms and analyze their complexity.
• Identify the correct and efficient ways of solving problems.
• Acquire knowledge about dynamic memory allocation, modular programming and data organization.
• Develop real time applications using the power of C language features.

UNIT I  COMPUTER FUNDAMENTALS  10

UNIT II  BASIC C PROGRAMMING  9
Structure of C Program – Keywords, Constants, Variables and Data Types – Operators and Expressions – Managing Input and Output operators – Decision Making – Branching and Looping.

UNIT III  FUNCTIONS, ARRAYS AND POINTERS  9

UNIT IV  STRUCTURES AND UNIONS  9

UNIT V  FILE HANDLING  8

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
SH105 ENGINEERING GRAPHICS
(Common to all B.E. / B.Tech., Degree Programmes)

COURSE OUTCOMES

- Students will be able to use the drawing instruments effectively.
- An ability to draw the basic engineering curves and problems related to projections of points, straight lines, planes and solids.
- Able to apply the knowledge acquired on practical applications of sectioning and development of solids.
- Able to draw simple solids and its sections in isometric view and projections and also to draw its perspective views.

Drawing Instruments – IS specifications on lines – drawing sheets – Printing letters and dimensioning – scales (not for examination) – First angle projection should be followed.

UNIT I  PLANE CURVES 12
Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloids – Epi and Hypo cycloids - construction of involutes of square and circle – Drawing of tangents and normal to the above curves.

UNIT II  PROJECTION OF POINTS, LINES AND PLANE SURFACES 12
Projection of points and straight lines located in the first quadrant – Traces – Determination of true lengths and true inclinations.
Projection of regular polygonal surfaces and circular lamina inclined to any one reference plane.

UNIT III  PROJECTION OF SOLIDS 12
Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.

UNIT IV  SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES 12
Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – obtaining true shape of section.
Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinder and cone – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.

UNIT V  ISOMETRIC AND PERSPECTIVE PROJECTIONS 12
Perspective projection of prisms, pyramids and cylinders by visual ray method and vanishing point method.

TOTAL: 60 PERIODS

Note: In end semester examination from each unit one question with either or pattern may be asked. No short questions.

TEXT BOOK

REFERENCES
SH106  C PROGRAMMING LABORATORY
(Common to all B.E. / B.Tech., Degree Programmes)

COURSE OUTCOMES
• Acquire logical thinking and problem solving skills.
• Implement the algorithms and analyze their complexity.
• Identify the correct and efficient ways of solving problems.
• Acquire hands on practice in dynamic memory allocation, modular programming and data organization.
• Implement real time applications using the power of C language features.

LIST OF EXPERIMENTS
1. Solve problems such as temperature conversion, student grading, interest calculation.
2. Finding the 2’s complement of a binary number.
3. Generation of the first ‘n’ terms of the Fibonacci sequence and prime sequence.
5. Given distance traveled by a vehicle as \( d = ut + \frac{1}{2}at^2 \), where ‘u’ and ‘a’ are the initial velocity and acceleration. Calculate the distance traveled for different time intervals.
6. Solving the roots of a quadratic equation.
7. Designing a simple arithmetic calculator. (Use switch statement)
8. Performing the following operations: (Use loop statement)
   i. Generate Pascal’s triangle.
   ii. Construct a Pyramid of numbers.
9. Performing the following operations to a string:
   i. To insert a sub-string into main string at a given position.
   ii. To delete ‘n’ characters from a given position in a string.
   iii. To replace a character of string either from beginning or ending or at a specified location.
10. Performing the following operations: (Use arrays)
    i. Matrix addition.
    ii. Transpose of a matrix.
    iii. Matrix multiplication by checking compatibility.
11. Performing the following operations: (Use recursive functions)
    i. To find the factorial of a given integer.
    ii. To find the GCD (Greatest Common Divisor) of two given integers.
    iii. To solve Towers of Hanoi problem.
12. Performing the Student Information Processing using File Handling concepts.

TOTAL: 45 PERIODS

SOFTWARE REQUIREMENTS
• Turbo C/ ANSI C Compiler
• Gcc compiler
SH107 PHYSICS AND CHEMISTRY LABORATORY – I
(Common to all B.E. / B.Tech., Degree Programmes)

PART A – PHYSICS LABORATORY – I

COURSE OUTCOMES
At the end of the Laboratory classes, the students are able to

• develop collaborative learning skills and to add some of their own ideas to the experiments and their explanations.

• understand the optical properties, mechanical properties and electrical properties.

LIST OF EXPERIMENTS
1. (a) Particle size determination using Diode Laser.
   (b) Determination of Laser parameters – Wavelength, and angle of divergence.
   (c) Determination of Numerical aperture and acceptance angle of an optical fiber.
2. Determination of thickness of a thin wire – Air wedge method.
3. Determination of velocity of sound and compressibility of the liquid – Ultrasonic Interferometer.
5. Determination of Young’s modulus – Non-uniform bending method.
7. Determination of specific resistance of a given coil of wire – Carey Foster’s Bridge.
   • A minimum of FIVE experiments shall be offered.

PART B - CHEMISTRY LABORATORY – I

COURSE OUTCOMES
The student

• can estimate the amount of hardness and acidity present in the water sample.

• gain knowledge about the estimation of nickel in an alloy.

• quantify the electrolyte by measuring the conductance and pH.

LIST OF EXPERIMENTS
1. Estimation of hardness of Water sample by EDTA method.
2. Estimation of acidity of Water sample.
3. Estimation of Nickel by EDTA method.
4. Conductometric titration (HCl Vs NaOH).
5. Conductometric titration (BaCl₂ Vs Na₂SO₄).
6. pH metric titration (HCl Vs NaOH).
7. Determination of molecular weight and degree of polymerization using Viscometry.
   • A minimum of FIVE experiments shall be offered.

   • Laboratory classes on alternate weeks for Physics and Chemistry.

TOTAL: 45 PERIODS
SH108  ENGINEERING PRACTICES LABORATORY  
(Common to all B.E. / B.Tech., Degree Programmes)  

L  T  P  C  
0  0  3  2  

COURSE OUTCOMES
• Students will be able to prepare the pipe connections and identify the various components 
  used in plumbing.  
• An ability to prepare simple wooden joints using wood working tools.  
• An ability to prepare simple lap, butt and tee joints using arc welding equipments.  
• An ability to prepare simple components using lathe and drilling machine.  

PART A – MECHANICAL AND CIVIL ENGINEERING PRACTICES  

I  PLUMBING WORKS:  
Study of components related to plumbing.  
Hands-on-exercise:  
Basic pipe connections – Mixed pipe material connection – Pipe connections with 
  different joining components.  

II  CARPENTRY PRACTICES:  
Study of the joints in roofs, doors, windows and furniture.  
Hands-on-exercise:  
Wood work, joints by sawing, planning and cutting.  

III  WELDING:  
Study of the tools used in welding Gas welding practice.  
Preparation of butt joints, lap joints and tee joints using arc welding.  

IV  BASIC MACHINING:  
(a) Simple Turning and Taper turning.  
(b) Drilling Practice.  

REFERENCES
PART B – ELECTRICAL AND ELECTRONICS ENGINEERING PRACTICES

COURSE OUTCOMES

- An ability to develop familiarity with rudimentary measurement equipment – signal generators, oscilloscopes, multimeters and power supplies.
- Ability to demonstrate and evaluate the parameters of basic electronic components (wires, resistors, capacitors, diodes etc.) based on their physical parameters and dimensions.
- Define, describe, and analyze fundamentals of Boolean algebra and digital logic gates.
- An ability to predict qualitatively and quantitatively compute the steady state AC responses of basic circuits using the phasor method.
- Gain experience in the documentation of measurements and procedures as well as the preparation of formal reports.

I ELECTRICAL ENGINEERING PRACTICE

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
5. Measurement of energy using single phase energy meter.

II ELECTRONICS ENGINEERING PRACTICE

1. Study of Electronic components and equipments – Resistor, colour coding, measurement of AC signal parameters (peak-peak, rms period, frequency) using CRO
2. Study of logic gates AND, OR, XOR and NOT.
4. Soldering practice – Components, Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor of HWR and FWR.

TOTAL: 45 PERIODS

REFERENCES

13C20  TECHNICAL ENGLISH – II
(Common to all B.E. / B.Tech., Degree Programmes)

COURSE OUTCOMES
The student will be able to
• apply correct form of language while Speaking and Writing.
• prepare his own Professional letter writings.
• interpret any passage after listening.
• interact at different situations fluently.

UNIT I                                                                                                                   10
Language Focus: Homonyms, Different grammatical forms of the same word, correct usage of words / phrases.
Writing: Recommendation writing.
Listening: Interpreting Poetic lines.
Speaking: Telephone English.

UNIT II                                                                                                                          9
Language Focus: Cause and Effect, Phrasal Verbs.
Listening: Conversations.
Speaking: Asking questions.

UNIT III                                                                                                                         9
Language Focus: Idioms and Phrases with animal names.
Writing: Checklist, Process Description.
Speaking: Presentations.

UNIT IV                                                                                                                         9
Language Focus: Technical Definitions, Transformation of Sentences.
Writing: Job Application Letter, Curriculum Vitae, Bio-data, Resume.
Speaking: Mock Interview.

UNIT V                                                                                                             8
Language Focus: British and American Vocabulary, Numerical Expressions.
Writing: E-mail Writing, Report Writing.
Speaking: Group Discussion.

SUGGESTED ACTIVITIES
1. Making sentences using different grammatical forms of the same word.
2. Exercises on combining sentences using Cause and Effect expressions.
4. Writing exercises on Recommendations.
5. Exercises on Idioms and Phrases.
7. Exercises on British and American English words with meanings.

TOTAL: 45 PERIODS

BOOK SUGGESTED FOR READING
REFERENCES

13C21 INTEGRAL CALCULUS AND TRANSFORMS
(Common to all B.E. / B.Tech., Degree Programmes)

COURSE OUTCOMES

• Ability to find area and volume of objects using double and triple integrals.
• Ability to analyze the concepts related to vector calculus and to apply them in engineering field.
• Ability to perform the ideas of Laplace transform and Z-transform in their respective engineering subjects.

UNIT I MULTIPLE INTEGRALS
Double integration – Cartesian and polar coordinates; Change of order of integration; Change of variables between cartesian and polar coordinates; Triple integration in cartesian coordinates; Area as double integral; Volume as triple integral.

UNIT II VECTOR CALCULUS
Gradient, Divergence and Curl – Directional derivative – Irrotational and solenoidal vector fields; Vector integration – Green’s theorem in a plane, Gauss divergence theorem and Stoke’s theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelopipeds.

UNIT III LAPLACE TRANSFORM

UNIT IV INVERSE LAPLACE TRANSFORM
Definition of Inverse Laplace transform – Convolution theorem – Solution of linear ordinary differential equations of second order with constant coefficients using Laplace transformation techniques and solution of simultaneous differential equations of first order with constant coefficients using Laplace transformation techniques.

UNIT V Z – TRANSFORM

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
13C22  SOLID STATE PHYSICS  
(Common to ECE, CSE, EEE, EIE and IT)

COURSE OUTCOMES
The Student will be able to

- identify the crystal lattices, their structures and how the structure influences its major properties at different levels.
- choose the major functional and structural properties required for specific applications of conducting materials.
- check the parameter that satisfies superconducting behaviour.
- relate technology to the physics of semiconductor devices.
- classify the magnetic materials and their storage applications.
- design optical materials that are able to be manufactured and measured using the state of art optical fabrication technologies.

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

UNIT II   CONDUCTING MATERIALS AND SUPERCONDUCTORS
Conductors

Superconductors
Superconductivity: Properties – Meissner effect – Isotopic effect; Types of superconductors – Type I and Type II superconductors; Applications of superconductors – Magnetic levitation.

UNIT III   SEMICONDUCTORS
Intrinsic semiconductor – carrier concentration derivation – Fermi level – variation of Fermi level with temperature – electrical conductivity – bandgap determination; Extrinsic semiconductors – carrier concentration derivation in n-type and p-type semiconductor – variation of Fermi level – with temperature and impurity concentration; Hall effect – Determination of Hall coefficient – Applications.

UNIT IV   MAGNETIC MATERIALS AND STORAGE DEVICES
Origin of magnetic moment, Bohr magneton, Dia and Para magnetism, Ferro magnetism – Domain theory – Hysteresis – soft and hard magnetic materials; Anti-ferromagnetic materials; Ferrites – structure and applications; magnetic recording and readout – storage of magnetic data – tapes, floppy, Hard disk and CD ROM.

UNIT V    OPTICAL MATERIALS
Optical properties of metals, insulators and semiconductors; Phosphorescence and fluorescence; Excitons traps and color centre and their importance; Different phosphors used in CRO screens, liquid crystal display, LED – working of LED; Thermography and its applications; Solar cell – PN junction solar cell – Conversion efficiency and solar concentration – Hetero junction solar cell.

TOTAL: 45 PERIODS
TEXT BOOKS

REFERENCES
13C23 CHEMISTRY OF ELECTRICAL AND ELECTRONIC MATERIALS
(Common to ECE, CSE, EEE, EIE and IT)

COURSE OUTCOMES
The students can

- apply the knowledge in designing new energy storing devices.
- identify the types of corrosion and to design a method to control the corrosion.
- apply the knowledge of photochemistry in designing the various electronic materials.
- choose proper analytical technique for analyzing the synthesized electronic materials.

UNIT I ENERGY SOURCES AND STORAGE DEVICES 9

UNIT II CORROSION AND ITS CONTROL 9

UNIT III PHOTOCHEMICAL PROCESSES 9

UNIT IV ELECTRONIC MATERIALS 9

UNIT V ANALYTICAL INSTRUMENTATION 9

TOTAL: 45 PERIODS
TEXT BOOKS

REFERENCES
13C24    ELECTRIC CIRCUITS AND ELECTRON DEVICES
(Common to CSE and IT)

COURSE OUTCOMES
Upon successful completion of this course, students will be able to
• Analyze the circuits using various network theorems.
• Compute the transient response of RL, RC and RLC circuits for AC and DC inputs.
• Determine the resonance condition for series and parallel circuits.
• Describe the operation and characteristics of different types of semiconductor diodes.
• Compare the operation and characteristics of various transistors like BJT, JFET and MOSFET.

UNIT I    CIRCUIT ANALYSIS TECHNIQUES
Ohm’s law, Kirchhoff’s laws – Resistors in series and parallel circuits – Mesh current and node
voltage method of analysis – Voltage and current division – Source transformation – Star-delta
conversion. Network Theorems: Thevenin’s theorem, Superposition theorem, Norton’s theorem,
Maximum power transfer theorem (only for resistive network).

UNIT II  TRANSIENT RESPONSE FOR CIRCUITS
Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and AC with
sinusoidal input.

UNIT III  RESONANT CIRCUITS
Voltage and current relation in pure Resistor, Inductor, Capacitor, RL, RC and RLC circuits – Series
and parallel circuits – Parallel and series resonances – their frequency response – Quality factor and
bandwidth.

UNIT IV    SEMICONDUCTOR DIODES
Review of intrinsic and 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 – Tunnel diode – PIN diode –
Varactor diode – Photodiode.

UNIT V    TRANSISTORS
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.

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS
1. A.Sudhakar, Shyammohan S.Palli, “Circuits and Networks - Analysis and Synthesis”, Tata
3. S.Salivahanan, N.Suresh kumar and A.Vallavaraj, “Electronic Devices and Circuits”, Tata
REFERENCES
13C25 BASIC CIVIL AND MECHANICAL ENGINEERING
(Common to ECE, CSE, EEE, EIE and IT)

COURSE OUTCOMES
- An ability to identify the various systems and its components of various power plants.
- An ability to state and differentiate the working principles of IC engines.
- Students will be able to identify the various systems and components of refrigeration and air conditioning systems.

A – CIVIL ENGINEERING

UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS

UNIT II BUILDING COMPONENTS AND STRUCTURES
Foundations: Types, Bearing capacity – Requirement of good foundations.

B – MECHANICAL ENGINEERING

UNIT III POWER PLANT ENGINEERING

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

UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM

TOTAL: 60 PERIODS

REFERENCES
COURSE OUTCOMES
Upon successful completion of this course, the students will be able to:

- Demonstrate how to use the UNIX Shell commands.
- Use the Shell programming constructs.
- Learn tracing mechanisms (for debugging), user variables, Shell variables, read-only variables, positional parameters, reading input to a Shell script.
- Test on numeric values, test on file type, and test on character strings using shell scripts.
- Write moderately complex Shell scripts and make them executable.

Execute programs written in C under UNIX environment.

LIST OF EXPERIMENTS

1. Study of UNIX OS, vi Editor.

2. Use of Basic UNIX Shell Commands:
   - ls, mkdir, rmdir, cd, cat, banner, touch, file, wc, sort, cut, grep, dd, dfspace, du, ulimit.

3. Shell Programming:
   i. Interactive shell scripts
   ii. Positional parameters
   iii. Arithmetic Operators
   iv. if-then-fi, if-then-else-fi, nested if-else
   v. Logical operators
   vi. if - elif, case structure
   vii. while, until, for loops, use of break
   viii. Metacharacters

4. Shell scripts for the following:
   i. Showing the count of users logged in
   ii. Printing column wise list of files in your home directory
   iii. To count lines, words and characters in its input (do not use wc)

5. C Programming on UNIX:
   i. Dynamic Storage Allocation
   ii. Pointers
   iii. Functions
   iv. File Handling

SOFTWARE REQUIREMENTS
- UNIX/LINUX OS
- Gcc compiler

TOTAL: 45 PERIODS
13C27 PHYSICS AND CHEMISTRY LABORATORY – II  
(Common to all B.E. / B.Tech., Degree Programmes)  
L T P C  
0 0 3 2

PART A - PHYSICS LABORATORY – II

COURSE OUTCOMES
At the end of the Laboratory classes, the students
- demonstrate and report the elastic behaviour of materials
- demonstrate the interference property of light waves
- demonstrate the diffraction property of light waves
- measure the thermal properties of conducting materials
- identify the substance that deforms continuously when subjected to shearing stress.

LIST OF EXPERIMENTS
1. Determination of Young’s modulus – Uniform bending method.  
2. Determination of Band Gap of a semiconductor material.  
3. Determination of Hall Co-efficient.  
5. Determination of wavelength of mercury spectrum using spectrometer and grating  
7. Torsional pendulum – Determination of Moment of Inertia of the disc and Rigidity modulus of the material of the wire.

- A minimum of FIVE experiments shall be offered.

PART B - CHEMISTRY LABORATORY – II

COURSE OUTCOMES
The student
- can estimate the amount of alkalinity and Dissolved Oxygen (DO) present in the water sample.  
- gain knowledge in the estimation of copper in an alloy and iron in rust.  
- quantify electrolyte and ion by measuring the conductance and emf.

LIST OF EXPERIMENTS
1. Estimation of copper in brass by EDTA method.  
2. Determination of Dissolved Oxygen (DO) in water (Winkler’s method)  
3. Estimation of alkalinity of Water sample  
4. Estimation of Fe^{3+} ion in rust by Dichrometry  
5. Conductometric titration (Mixture of acids vs NaOH)  
6. Potentiometric Titration (Fe^{2+} vs K_{2}Cr_{2}O_{7})  
7. Estimation of Fe^{3+} ion by spectrophotometry.

TOTAL: 45 PERIODS

- A minimum of FIVE experiments shall be offered.  
- Laboratory classes on alternate weeks for Physics and Chemistry.
13C28 ELECTRONIC DEVICES AND CIRCUITS LABORATORY  
(Common to CSE and IT)  

COURSE OUTCOMES  
Upon successful completion of this course, students will be able to  
- Analyze the circuits using various network theorems and laws.  
- Determine the parameters from the characteristics of diodes and transistors.  

LIST OF EXPERIMENTS  
1. Verification of Ohm’s laws  
2. Verification of Mesh and Nodal analysis  
3. Verification of KVL and KCL  
4. Verification of Thevenin’s Theorem  
5. Verification of Norton’s Theorem  
6. Verification of superposition Theorem  
7. Verification of Maximum power transfer Theorem  
11. Characteristics of CE configuration  
12. Characteristics of CB configuration  
8. Characteristics of PN diode  
9. Characteristics of Zener diode  
10. Characteristics of Photodiode  

TOTAL: 45 PERIODS
13C29 ENGLISH LANGUAGE SKILL LABORATORY
(Common to all B.E. / B.Tech., Degree Programmes)

COURSE OUTCOMES
The Student will
- improve their pronunciation skill.
- gather information from any speech.
- imbibe the stress and intonation of the native speakers’ accent.

1. Micro Skills
   - Spotting the Homonyms / Silent letter words / mispronounced words
   - Identifying the missing words in native speech
   - Finding the cluster words
   - Marking correct punctuation
   - Marking word chunks
   - Identification of sentences

2. Content Comprehension and making inferences
   - Listening to audio files of Speech, Poetry, Recent Issues, News clippings, etc
     a. True / False
     b. Multiple Choice Questions
     c. Filling the blanks
     d. Filling the charts

3. Listen and Act
   - Drawing the map using audio
   - Picture completing task
   - Transferring data to Graph

4. Interpreting the video clippings

5. Listening to Conversations

TOTAL: 30 PERIODS
13CS31       COMPLEX ANALYSIS AND NUMERICAL METHODS       L T P C
            3 1 0 4

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
• Use the Cauchy Riemann equations to test analytic function and construct such a function
given the real or imaginary part.
• Evaluate residues and use the Residue Theorem to evaluate contour integrals.
• Construct Fourier series of periodic function.
• Calculate Fourier Transform and its Inverse Transform.
• Use numerical techniques for solving linear system of equations and numerical integration
problems.

UNIT I  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 II  COMPLEX INTEGRATION                    12
Complex integration – Statement and applications of Cauchy’s integral theorem and Cauchy’s integral
formula – Singular points – Residues – Residue theorem – Application of residue theorem to evaluate
real integrals – Unit circle and semi-circular contour(excluding poles on boundaries).

UNIT III  FOURIER SERIES                     12
Dirichlet’s conditions – General Fourier series – Odd and even functions – Half range sine series –
Half range cosine series – Complex form of Fourier series – Parseval’s identity – Harmonic analysis.

UNIT IV  FOURIER TRANSFORMS                    12
Fourier integral theorem (without proof) – Fourier transform pair – Sine and Cosine transforms –

UNIT V  NUMERICAL METHODS                    12
LU decomposition for system of linear equations – Numerical solutions of non-linear algebraic
equations: Secant method – Bisection method – Newton-Raphson method - Numerical Integration:
Trapezoidal and Simpson’s rule for single and double integrals.

L: 45 T: 15   TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
   2007.
COURSE OUTCOMES
Upon successful completion of course the student will be able to
• Understand the various ecosystem and biodiversity
• Classify the different types of natural resources and identify the role of individual in conservation of resources
• Identify and analyse the causes, effects and control measures of environmental pollution
• Identify the different types of environmental hazards and their management
• Analyse the social issues related to the environment and how human population affect the environment

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY
Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers– energy flow in the ecosystem – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) aquatic (pond) ecosystems. Field study of simple ecosystems –pond and forest. Introduction to biodiversity: definition - genetic, species and ecosystem diversity – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values –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. Field study of common plants, insects, birds.

UNIT II NATURAL RESOURCES
Forest resources: Use and over-exploitation, deforestation, case studies- dams and their effects on forests and tribal people – Water resources: Use and overutilization of surface and ground water – 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, case studies – 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 III ENVIRONMENTAL POLLUTION
Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Noise pollution (e) Nuclear hazards – solid waste management: causes, effects and control measures of municipal solid wastes – e-Waste: Definition-dimension of the problem - source-toxic Substances in e-waste - risks related to toxic substances–environmental problems-role of an individual in prevention of pollution.

UNIT IV ENVIRONMENTAL HAZARDS
Environmental hazards: Definition – Hazard- Types-Natural and man-made hazards – Natural hazards: Causes, effect and management of Earthquake, Flood, Landslide, Cyclones and Tsunami; Man-made Hazards: Hazards due to dams and reservoirs, hazards due to nuclear power plant, Industrial hazards. Case study: Chernobyl disaster, Bhopal gas tragedy.

UNIT V SOCIAL ISSUES, HUMAN POPULATION AND THE ENVIRONMENT

TOTAL: 45 PERIODS
TEXT BOOKS

REFERENCES
**13CS33 DATA STRUCTURES AND APPLICATIONS**

**L T P C**

3 1 0 4

**COURSE OUTCOMES**

Upon successful completion of this course, the students will be able to

- Implement basic ADTs like linked list, queue and stack using both static and dynamic memory allocations.
- Recognize the data organization and applications of binary trees and binary search trees.
- Analyze the importance of self-balancing trees for effective organizing the data.
- Identify suitable algorithms for solving hashing, shortest path, network link analysis, and minimum spanning tree.
- Identify data structuring strategies that are appropriate to a given contextual problem.

**UNIT I LINEAR STRUCTURES**


**UNIT II TREE STRUCTURES**


**UNIT III BALANCED TREES**


**UNIT IV HASHING AND HEAPS**


**UNIT V GRAPHS**


L: 45 T: 15 TOTAL: 60 PERIODS

**TEXT BOOK**


**REFERENCES**

13CS34 COMPUTER NETWORKS L T P C 3 1 0 4

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
• Describe and distinguish the functionalities of layers in OSI architecture
• Illustrate the various flow and error control techniques and identify the best method for efficient data transmission.
• Enumerate different medium access control mechanisms
• Apply various routing algorithms for a network and determine the optimal path
• Integrate the working of protocols in higher level layers

UNIT I INTRODUCTION 12

UNIT II DATA LINK LAYER 12

UNIT III NETWORK LAYER 12

UNIT IV TRANSPORT LAYER 12

UNIT V APPLICATION LAYER 12

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOK

REFERENCES
COURSE OUTCOMES
Upon successful completion of the course, the students will be able to
- Use pointers and dynamic memory allocation in C++ classes
- Recognize and use object oriented programming constructs to write object oriented programs
- Describe encapsulation, polymorphism and inheritance
- Create and modify objects using C++ classes
- Determine the appropriate objects required to solve a programming problem
- Practice exception handling mechanisms to handle runtime errors
- Differentiate function templates and class templates
- Explain about the namespaces

UNIT I BASIC CONCEPTS
Classes and objects: classes - structures and classes - unions and classes - friend functions - friend classes - inline functions - parameterized constructors - static class members - scope resolution operator - nested classes - local classes - passing objects to functions - returning objects - object assignment. Arrays, Pointers, References and Dynamic Allocation Operators: Arrays of Objects – Pointers to Objects – Type Checking – This Pointer – Pointers to Derived Types – Pointers to Class Members – References – Dynamic Allocation Operators.

UNIT II FUNCTION OVERLOADING AND CONSTRUCTORS

UNIT III INHERITANCE AND POLYMORPHISM

UNIT IV TEMPLATES AND EXCEPTION HANDLING

UNIT V I/O STREAMS

TOTAL: 45 PERIODS
TEXT BOOKS

REFERENCES
13CS36 DIGITAL PRINCIPLES AND SYSTEM DESIGN  L T P C
3 0 2 4

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
• Recall Number System and number Conversion.
• Distinguish different methods used for simplification of Boolean functions.
• Contrast combinational circuits and Sequential circuits.
• Reconstruct and implement synchronous sequential circuits.
• Compose programs in Hardware Description Language for synchronous sequential circuits.

UNIT I NUMBER SYSTEMS AND BOOLEAN ALGEBRA 12

UNIT II COMBINATIONAL LOGIC DESIGN (Practical) 12
Analysis and design procedures of Combinational circuits - Arithmetic Circuits: Binary / BCD adders and subtractors, Carry look ahead adder, Magnitude comparator, Code conversion Decoders, Encoders, Multiplexers and Demultiplexers.

UNIT III SYNCHRONOUS SEQUENTIAL LOGIC 12

UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC 12
Introduction to Asynchronous Sequential Circuits – Fundamental mode and Pulse mode circuits, Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race free state assignment - Hazards.

UNIT V PROGRAMMABLE LOGIC DEVICES AND HDL 12
Introduction to PLDs – ROM, PAL, PLA, Implementation of digital functions using PLDs. Introduction to Hardware Description Language – Behavioral, Dataflow and gate level modeling-Simple HDL codes for combinational circuits and sequential circuits (Practical).

L: 45 P: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
13CS37 DATA STRUCTURES LABORATORY L T P C
0 0 3 2

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
- Describe the basic concept of data structures.
- Implement linked list using static and dynamic memory allocation.
- Analyze the operations of stack and queue.
- Implement the arithmetic expression using trees.
- Distinguish the opened and closed hashing techniques.

LIST OF EXPERIMENTS
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 heap.
9. Implement hashing with open addressing.
10. Implement Prim's algorithm and Kruskal’s Algorithm using priority queues to find MST of an undirected graph.
11. Implement Dijkstra's algorithm to find the shortest path.

TOTAL: 45 PERIODS

LIST OF EQUIPMENTS AND COMPONENTS FOR A BATCH OF 30 STUDENTS
(PER BATCH)

HARDWARE
- 30 Systems with core i5 Processor

SOFTWARE
- Turbo C++/GCC Compiler – to be installed in all PC’s.
- OS – LINUX/ Windows 2000/ Windows XP/ NT
13CS38 OBJECT ORIENTED PROGRAMMING LABORATORY  L T P C
0 0 3 2

COURSE OUTCOMES
Upon successful completion of this course, students will be able to
• Design object oriented programs with static members and friend functions using C++
• Implement C++ programs with operator overloading and type conversions
• Develop class templates for various data structures like stack, queue and linked list.
• Apply function templates concepts in standard sorting algorithms such as bubble sort, insertion sort, merge sort and quick sort.
• Create classes with necessary exception handling
• Construct simple test applications using dynamic polymorphism.

LIST OF EXPERIMENTS
1. Design C++ classes with static members, methods with default arguments, friend functions.
   (For example, design matrix and vector classes with static allocation, and a friend function to do matrix-vector multiplication).
2. Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of assignment operator.
3. Implement complex number class with necessary operator overloading and type conversions such as integer to complex, double to complex, complex to double etc.
4. Overload the new and delete operators to provide custom dynamic allocation of memory.
5. Develop C++ class hierarchy for various types of inheritances.
6. Design a simple test application to demonstrate dynamic polymorphism and RTTI.
7. Develop a template of linked-list class and its methods.
8. Develop templates of standard sorting algorithms such as bubble sort, insertion sort and quick sort.
9. Design stack and queue classes with necessary exception handling.
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).

TOTAL: 45 PERIODS

LIST OF EQUIPMENTS AND SOFTWARE FOR A BATCH OF 30 STUDENTS

HARDWARE
• 30 Systems with core i5 Processor

SOFTWARE
• Turbo C++/GCC Compiler – to be installed in all PC’s.
• OS – LINUX/ Windows 2000/ Windows XP/ NT
13CS39 COMMUNICATION SKILLS AND TECHNICAL SEMINAR L T P C
(Common to all B.E. / B.Tech. Degree Programmes) 0 0 3 2

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
• Express themselves fluently and appropriately in social and professional contexts.
• Develop the sub-skills required for paper presentations and group discussions.
• Acquire the soft skills and interpersonal skills which will help them to excel in their workplace.

A) LANGUAGE FUNCTIONS (15 hrs)
1. Compare and contrast
2. Giving reasons
3. Reporting
4. Expressing agreement and disagreement
5. Evaluating different standpoints
6. Analyzing a problem and giving solution
7. Describing daily routines, events, and weather
8. Describing Objects
9. Defending a point of view
10. Talking about future plans and intentions

Language Functions:
The teacher should build micro activities to develop the use of language required to handle these sub-functions of communication. In the process, the learners should get used to the linguistic Elements needed for these functions.

B) SPEECH PRACTICE (15 hrs)
The themes are:
1. Cloning
2. Artificial satellites
3. Renewable sources
4. Telecommunication
5. Cyber Revolution
6. Space research
7. Polythene pollution
8. Fossil fuels
9. Safety measures in Automobiles
10. Ecological threats
11. Water resources
12. Nuclear technology
13. Scientific farming
14. Thermal power plants
15. Nano Technology
16. Robotics
17. Artificial intelligence
18. Role of Fibre Optics
19. Exploration of Mars
20. Gas turbines
21. Indian space missions
22. Converting agricultural wastes for useful purposes
23. Developments in transportation
24. Scientific Farming
25. Impact of global warming
26. Desalination of water
27. Technology for national security
28. Industrial development and ecological issues
29. Recent trends in Automobiles
30. Hazards of E-waste
31. Mobile Jammer
32. Touch Screen Technology
33. Tidal Power
34. 3G Technology
35. Tsunami Warning System
36. Blue Tooth Technology

Seminar presentation on the themes allotted:
Each student should collect materials from Books, Internet, Journals and Newspapers for his/her theme and prepare a short Seminar Paper for 4 to 5 Pages. The presentation should be for 10 minutes using power point frames. It should be followed by a Viva Voce during which others should come forward to question, clarify, supplement or evaluate.

C) GROUP DISCUSSION / DEBATE (10hrs)
Grouping (each group consisting of 12 members)
Topics (12 topics – 3 topics to be selected by each group - to be practiced in cycles)

Group Discussion / Debate Topics:
1. Advertising is a legalized form of lying- Discuss.
2. Communicative competency in English is the golden key for success in the Global arena.
3. Is it just to force people to retire?
4. Attitude decides one’s altitude in life.
5. Should an aspiring student go for a course which is in demand or for a course which he/she likes?
6. Is westernization a cultural degradation or enrichment?
7. Is Brain drain a threat to India?
9. Do Mobile phones spoil the youth?
10. No two generations see eye to eye- Discuss.
11. Is scientific advancement a boon or a bane?
12. Does ragging develop friendship?

D) SPEAKING ON THE GIVEN PICTURE/DIAGRAM/CHART/TABLE (5 hrs)
RECORD LAY OUT:
Every student has to maintain a record in which he/she has to incorporate the following details.
- First page containing learner details and the topic of specialization
- Use of appropriate Language used in Language Function should be listed.
- Three newspaper cuttings or journal or internet sources related to the specialized theme. (To be pasted on the pages)
- 10 Quiz questions of the specialized topic with expected answers.
- The seminar paper presented by the learner (to be pasted).
- Notes of observation - Lab. (Details about Interview skills – GD – Soft skills)
- The record should be duly signed by the course teacher and submitted to the External Examiner for verification during the semester practical.

TOTAL: 45 PERIODS

REFERENCES
13CS41 PROBABILITY AND QUEUEING THEORY  

L T P C  
3 1 0 4  

COURSE OUTCOMES  
On successful completion of this course, the student should be able to  
• Have a fundamental knowledge of the basic probability concepts.  
• 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 12  
Discrete and continuous random variables - Moments - Moment generating functions and their properties; Binomial, Poisson, Geometric, Uniform, Exponential, Gamma and Normal distributions.  

UNIT II TWO DIMENSIONAL RANDOM VARIABLES 12  
Joint distributions - Marginal and conditional distributions – Covariance - Correlation and regression - Transformation of random variables.  

UNIT III MARKOV PROCESSES AND MARKOV CHAINS 12  

UNIT IV QUEUEING THEORY 12  
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 12  
M/G/1 queue – Pollaczek - Khintchine formula, series queues - open and closed networks.  

L: 45  T: 15  TOTAL: 60 PERIODS  

TEXT BOOKS  

REFERENCES  
COURSE OUTCOMES
Upon successful completion of the course, the students will be able to
- Solve recurrence equations by considering time and space complexity.
- Analyze the complexities of various problems in different domains.
- Solve the problems using proper algorithms and design techniques.
- Synthesize efficient algorithms in common engineering design situations.

UNIT I ALGORITHM ANALYSIS

UNIT II PROBLEM SOLVING TECHNIQUES

UNIT III DYNAMIC PROGRAMMING

UNIT IV BACKTRACKING

UNIT V ANALYSIS OF GRAPH
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.

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
13CS43 OPERATING SYSTEMS

COURSE OUTCOMES
Upon successful completion of the course, the students will be able to
- Identify the functions of Operating Systems.
- Discuss the concepts of process management.
- Predict and analyze deadlocks.
- Describe the importance of storage management.
- Understand the basics of file systems and I/O systems.

UNIT I PROCESSES
Introduction to operating systems – operating system structures – system calls – system programs –
- Cooperating processes – Interprocess communication – Communication in client-server systems.

UNIT II THREADS, PROCESS SCHEDULING AND SYNCHRONIZATION
Threads: Multi-threading models – Threading issues - CPU Scheduling: Scheduling criteria –
- Scheduling algorithms – Multiple processor scheduling – Real time scheduling – Algorithm
- of synchronization – critical regions – Monitors.

UNIT III DEADLOCK
Deadlock: System model – Deadlock characterization – Methods for handling deadlocks – Deadlock

UNIT IV STORAGE MANAGEMENT
Memory Management: Background – Swapping – Contiguous memory allocation – Paging –
- Segmentation – Segmentation with paging - Virtual Memory: Background – Demand paging –

UNIT V FILE SYSTEMS AND I/O SYSTEMS
- Protection - File-System Implementation: Directory implementation – Allocation methods – Free
- management.

TEXT BOOK

REFERENCES
13CS44  

JAVA PROGRAMMING  

L T P C  

3 1 0 4  

COURSE OUTCOMES  

Upon successful completion of the course, the students will be able to  
- Write Java programs with properly-designed constants, variables, methods and string handling to solve simple problems.  
- Design Java object classes based on Object-Oriented concepts  
- Use simple try-catch blocks for Exception Handling and manage I/O streams oriented interactions.  
- Develop multi-thread programming for concurrency control based applications  
- Construct user interfaces for Java applications and applets using GUI elements  

UNIT I  

JAVA BASICS AND OOPS  


UNIT II  

MULTITHREADED PROGRAMMING IN JAVA  


UNIT III  

I/O AND EXPLORING JAVA.IO  

I/O Basics - Reading Console Input - Writing Console output - Native Methods - I/O Classes and Interfaces - File - The Byte Streams - The Character Streams - Using Stream I/O - Serialization. String Handling - Special string operations - Character extraction - string comparison - Modifying a String.  

UNIT IV  

APPLETS, EVENT HANDLING AND AWT  


UNIT V  

JDBC, RMI AND SERVLETS  


L: 45  T: 15  TOTAL: 60 PERIODS  

TEXT BOOKS  

REFERENCES  
COURSE OUTCOMES

Upon successful completion of the course, students will be able to

- Understand the structure and functions of a database management system
- Exemplify the concept of E-R model
- Demonstrate the basics of SQL and construct queries using SQL.
- Describe the relational database theory, and apply relational algebra Expressions for queries
- Comprehend the concept of database schema normalization rules and techniques
- Understand the basic issues of transaction processing and concurrency control.
- Grasp data storage, indexing and query processing techniques.

UNIT I  INTRODUCTION


UNIT II  RELATIONAL MODEL


UNIT III  DATABASE DESIGN


UNIT IV  TRANSACTION MANAGEMENT


UNIT V  DATA STORAGE AND QUERYING


TOTAL: 45 PERIODS

TEXT BOOKS


REFERENCES

13CS46  COMPUTER ORGANIZATION AND ARCHITECTURE  L T P C  3 1 0 4

COURSE OUTCOMES
Upon successful completion of the course, the students will be able to
• Appreciate the role of functional units and various architectural features
• Interpret the execution procedure
• Analyze the hardwired and programmed ALU design techniques
• Identify the factors that degrade pipeline performance and its counter measure
• Depict the role of each memory in the memory hierarchy

UNIT I  BASIC STRUCTURE OF COMPUTERS  12
Functional units – Basic operational concepts – Bus structures – Performance– Memory locations and addresses- Memory operations - Instructions and instruction sequencing – Instruction set architecture – Addressing modes- I/O Operations

UNIT II  BASIC PROCESSING UNIT  12
Fixed point arithmetic- Addition and subtraction of signed numbers –multiplication of positive Numbers- signed operand multiplication and fast multiplication –restoring and non restoring division algorithm - floating point numbers and operations. Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control.

UNIT III  PIPELINING  12
Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets –Data path and control considerations –superscalar operations- Performance considerations.

UNIT IV  MEMORY SYSTEM  12

UNIT V  MULTIPROCESSOR  12

L:  45  T:  15  TOTAL:  60 PERIODS

TEXT BOOKS

REFERENCES
13CS47 OPERATING SYSTEMS LABORATORY  L T P C 
0 0 3 2

COURSE OUTCOMES
Upon successful completion of the course, the students will be able to
• Understand the system calls and I/O system calls in UNIX
• Evaluate the process scheduling algorithms FCFS, SJF, Priority and Round robin
• Simulate the process communication through various techniques
• Simulate memory management schemes
• Simulate File allocation Techniques

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

LIST OF EXPERIMENTS
1. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, 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 and pipes)
7. Simulate the Producer – Consumer problem using semaphores (using UNIX system calls).
8. Simulate First fit, best fit and Worst fit memory management algorithms.
9. Simulate Page Replacement Algorithms (FIFO, LRU and Optimal)
10. Simulate Paging memory management scheme
11. Simulate file allocation techniques (Linked, Indexed or Contiguous)

TOTAL: 45 PERIODS
13CS48 JAVA DATABASE ACCESS LABORATORY  

COURSE OUTCOMES
Upon successful completion of the course, the students will be able to
• Declare and enforce integrity constraints on a database using RDBMS.
• Devise a complex query using SQL DML/DDL commands.
• Create views and use in-built functions to query a database.
• Write PL/SQL programs with various types of control structure.
• Develop programs using object oriented concepts, exception handling and multi-threading.
• Design and implement data driven applications and assign responsibilities.

LIST OF EXPERIMENTS
1. DDL and DML commands
2. In-built functions and views
3. Nested Queries & Join Queries
4. PL/SQL programs to implement various types of control structure.
5. Programs to illustrate the use of method overloading & overriding.
6. Programs to implement the concept of interfaces and packages.
7. Program to implements exception handling and multithreading techniques.
8. Configuring JDBC project and create a database connection.
10. Create a servlet application which receive the Id of an employee from the html page and retrieving the details from the database.

Mini-project (Any One)
(Front End: Java, Back End: Oracle, Define classes for the application and assign responsibilities)
• Central Library OPAC Engine
• ATM Banking
• Online Shopping
• E-Ticketing System
• Student Information Management System
• City Info Browser
• E-mail Server

SUGGESTED SOFTWARES
• Front end: JAVA
• Back end: Oracle 11g / MY SQL / DB2
  (DB server could be loaded and can be connected from individual PCs)
• Platform: Windows 2000 Professional/XP