REGULATIONS – 2013

DEPARTMENT OF
INFORMATION TECHNOLOGY

CURRICULUM AND SYLLABI OF
I & II - YEAR
B.Tech. – INFORMATION TECHNOLOGY
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
DEPARTMENT OF INFORMATION TECHNOLOGY

VISION

• To produce highly competent and value based IT professionals

MISSION

• Updating curriculum with innovative components in Teaching - Learning process.

• Conducting student centric programme to enhance communication, team spirit, leadership skills and self learning.

• Motivating the students to realize the need of ethics and human values.

• Developing a conducive environment for collaborative research.

Program Educational Objectives (PEO)

Programme educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

1. Incorporate the basic principles and practices of computing to shine in IT field and/or in higher education

2. Maintain professionalism, effective communication skills, team spirit, learning attitude and adapt to emerging technologies
**Program Outcomes (PO)**

At the time of graduation graduates of our IT programme are expected to have

1. An ability to apply knowledge of mathematics, science and computing fundamentals to information technology.
2. An ability to analyze a problem, identify and define the computing and technology requirements appropriate to its solution.
3. An ability to design, develop and evaluate a computer-based system, process, component, or program to meet desired needs.
4. An ability to use research based knowledge to analyze and interpret data to provide valid conclusions.
5. An ability to use the techniques, skills and modern software engineering tools necessary for IT practice.
6. An understanding of professional, ethical, legal, security, social issues and responsibilities.
7. An ability to understand the impact of engineering solutions in a global, economic, environmental and societal context.
8. An ability to apply ethical principles and commit to professional ethics and responsibilities.
9. An ability to work independently and cooperatively to deliver reports, programs, projects, and other deliverables.
10. An ability to communicate effectively with a range of audiences using various modalities including written, oral and graphical.
11. An ability to apply the engineering and management principles to manage projects as a member and a leader in a team.
12. An ability to acquire new knowledge in the computing discipline and to engage in life-long learning.
## REGULATIONS 2013 – CURRICULUM AND SYLLABI

### B.Tech. – INFORMATION TECHNOLOGY

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

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<th>S. NO.</th>
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**Total Number of Credits:** 27
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**Total Number of Credits**: 29
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SH100                                 TECHNICAL ENGLISH – I
(Common to all B.E. / B.Tech., Degree Programmes)                                      L T P C
3 1 0 4

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                                                                                                                             12
Language Focus: Technical Vocabulary, Word Formation, Concord, Tense (Present).
Writing: Leave Application Letter, Paragraph writing.
Listening: Listening to correct pronunciation of words.

UNIT II                                                                                                                            12
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                                                                                                                         12
Language Focus: Compound nouns, Tense (Future), Preposition, Comparative Adjectives.
Listening: Listening to the conversations.
Speaking: One minute speech.

UNIT IV                                                                                                                         12
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                                                                                                                         12
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

SH101        MATRICES AND DIFFERENTIAL CALCULUS  
(Common to all B.E., B.Tech., Degree Programmes)  

L T P C  
3 1 0 4  

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  
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  
Curvature in cartesian, parametric and polar forms; Centre, radius and circle of curvature; Evolutes.  

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

UNIT IV  ORDINARY DIFFERENTIAL EQUATIONS  
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  
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)  

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  

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  


UNIT III  LASERS  

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  

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  

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)  

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  

UNIT II  BASIC C PROGRAMMING  
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  
Functions: User-defined functions – Definitions – Declarations - Call by reference – Call by value. 
Arrays: Declaration – Definition – Multidimensional Arrays – Functions with array as arguments. 
Pointers: Initialization – Pointers as Arguments – Pointers to Pointers – Dynamic Memory Management Functions. 

UNIT IV  STRUCTURES AND UNIONS  

UNIT V  FILE HANDLING  

TOTAL: 45 PERIODS 

TEXT BOOKS  

REFERENCES  
SH105  ENGINEERING GRAPHICS  
(Common to all B.E. / B.Tech., Degree Programmes)  
L T P C  
2 3 0 4

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

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)

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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)  

**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 10

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 12

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

13G20 TECHNICAL ENGLISH – II
(Common to all B.E. / B.Tech., Degree Programmes)

L T P C
3 0 0 3

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

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

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

UNIT V
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
13G21 INTEGRAL CALCULUS AND TRANSFORMS
(Common to all B.E. / B.Tech., Degree Programmes)

L T P C
3 1 0 4

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 12
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 12
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 12

UNIT IV INVERSE LAPLACE TRANSFORM 12
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 12

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
13G22 SOLID STATE PHYSICS  
(Conmon 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. 
• check the parameter that satisfies superconduction 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
13G23  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
Nuclear energy: definition – mass defect; types of nuclear reactions: nuclear fission – characteristics –
nuclear chain reaction – fusion reactions – difference between nuclear fusion and fission reaction;
advantages; wind energy: wind mill – advantages; storage batteries: types – primary battery – alkaline
battery – secondary battery – lead-acid, nickel-cadmium; lithium battery; fuel cell: H₂-O₂ fuel cell.

UNIT II  CORROSION AND ITS CONTROL
Chemical corrosion: oxidation corrosion – Pilling-Bedworth rule; electrochemical corrosion:
mechanism – hydrogen evolution mechanism – oxygen absorption mechanism – galvanic corrosion –
differential aeration corrosion; factors influencing corrosion; corrosion control: cathodic protection:
sacrificial anodic protection – impressed current cathodic protection – inhibitors; electroplating:
methods of cleaning the article – electroplating of gold; electroless plating: advantages over electroplating –
electroless plating of nickel.

UNIT III  PHOTOCHEMICAL PROCESSES
Photochemical reactions: definition, characteristics; laws of photochemistry – Grothus-Draper’s law –
Stark-Einstein’s law – Beer-Lambert’s Law; quantum yield: definition, reason for low and high yield;
photochemical equilibrium: photochemical synthesis of hydrogen chloride; photophysical processes:
types – non radiative transition – internal conversion – inter system crossing – radiative transition –
fluorescence – phosphorescence; chemiluminescence, thermoluminescence, photosensitization:
definition, halogen photosensitizer, applications.

UNIT IV  ELECTRONIC MATERIALS
Organic semiconducting materials: advantages; p-type and n-type semiconducting materials –
pentacene – fullerens-C-60; organic dielectric material: definition, examples – polystyrene – PMMA;
organic light emitting polymer: polythiophene; conducting polymers: types – intrinsically conducting
polymer – doped conducting polymer – extrinsically conducting polymer – coordination conducting
copolymer, applications; polymer with piezoelectric, pyroelectric and ferroelectric properties:
polyvinylidenefluoride; OLED materials: definition, polymer OLED material – polyphenylene
vinylene.

UNIT V  ANALYTICAL INSTRUMENTATION
UV-Visible spectroscopy: types of transitions – chromophore, auxochrome – instrumentation (block
diagram only) – applications; IR spectroscopy: molecular vibrations – linear molecule – CO₂ –
nonlinear molecule – H₂O – instrumentation (block diagram only) – applications; Atomic absorption
spectroscopy: principle – instrumentation (block diagram only) – estimation of nickel by AAS; flame
photometry: principle – instrumentation (block diagram only) – estimation of sodium by flame
photometry; thermogravimetry (TG): definition – instrumentation (block diagram only) –
characteristics of thermogram – factors influencing thermogravimetry – analyzing CuSO₄.5H₂O
thermogram – applications.

TOTAL: 45 PERIODS
TEXT BOOKS

REFERENCES
13G24 ELECTRIC CIRCUITS AND ELECTRON DEVICES  
(Common to CSE and IT)  

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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  

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  

UNIT IV SEMICONDUCTOR DIODES  

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  

REFERENCES  
13G25 BASIC CIVIL AND MECHANICAL ENGINEERING  
(Common to ECE, CSE, EEE, EIE and IT)  

L T P C  
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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  
Terminology of refrigeration and air conditioning – Principle of vapour compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room air conditioner.  

TOTAL: 60 PERIODS  

REFERENCES  
13G26 COMPUTER PROGRAMMING LABORATORY  
(Common to all B.E. / B.Tech., Degree Programmes)  

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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
13G27 PHYSICS AND CHEMISTRY LABORATORY – II  
(Common to all B.E. / B.Tech., Degree Programmes)  

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PART A - PHYSICS LABORATORY – II

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

• understand the role of direct observation in Physics and to distinguish between inferences based on theory and the outcomes of the experiments.
• experience with experimental processes, including some experience designing investigation.

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.
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 the 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$^{2+}$ 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.
13G28      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
13G29 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
13IT31 FOURIER TRANSFORMS AND COMPLEX ANALYSIS

COURSE OUTCOMES
On successful completion of the course, the students should be able to
• Perform Fourier series analysis of the functions.
• Implement the properties of Fourier transforms and Compute the Fourier transforms of various functions.
• Calculate the Fourier series solution of Wave and Heat equations.
• Grasp analytic functions and their properties and be introduced to the host of conformal mappings with suitable examples that have direct application.
• Understand the basics of complex integration and the concept of contour integration encountered in practice.

UNIT I FOURIER SERIES

UNIT II FOURIER TRANSFORMS

UNIT III APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS
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 IV ANALYTIC FUNCTIONS
Functions of a complex variable – Analytic functions – Necessary and Sufficient conditions excluding proofs) – Harmonic and orthogonal properties of analytic functions – Harmonic conjugate – Construction of analytic functions – Conformal mapping: w = z+c, cz, 1/z and bilinear transformation.

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

L: 45 T:15, TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
13IT32 ENVIRONMENTAL SCIENCE AND ENGINEERING L T P C 3 0 0 3

(Course to all B.E./B.Tech. Degree Programmes)

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 9
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 9
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 9
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 9
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 9

TOTAL: 45 PERIODS
TEXT BOOKS

REFERENCES
13IT33 DATA STRUCTURES  

COURSE OUTCOMES
On Successful completion of this course, Students will be able to
- Understand the basic concepts of different linear data structures and apply appropriate data structure for solving computing problems.
- Understand the design concepts of Non-Linear data structure and apply appropriate method for solving the problems.
- Design simple algorithms for solving computing problems and recognize the associated algorithm's operations and complexity.

UNIT I FUNDAMENTALS OF ALGORITHMS  
12

UNIT II LINEAR STRUCTURES  
12
Abstract Data Types (ADT) – Array implementation – linked list implementation – singly linked lists – doubly-linked lists – applications of lists – Stack ADT – Queue ADT – Applications of stacks and queues.

UNIT III SORTING AND SEARCHING  
12

UNIT IV TREE STRUCTURES  
12

UNIT V GRAPHS  
12

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
13IT34  OBJECT ORIENTED PROGRAMMING USING C++ L T P C 

3 1 0 4

COURSE OUTCOMES
On Successful completion of this course, Students will be able to

- Discuss the basic concepts of Object Oriented Programming.
- Illustrate class, objects, constructors and destructor.
- Employ templates and exception handling.
- Apply the concept of inheritance and polymorphism.
- Explain the concept of file handling, namespaces, ANSI string objects and STL.

UNIT I  INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING PARADIGM AND CONCEPTS  12

UNIT II  CLASSES, OBJECTS AND MEMBER FUNCTIONS IN C++  12
Class Specification – Class objects – Accessing class members – Defining member functions – Outside member functions – Accessing member function – Pointers within a class – passing objects as arguments – Returning objects from functions – friend functions and classes – static data and member functions – nested classes – object initialization and clean up.

UNIT III  TEMPLATES AND EXCEPTION HANDLING  12
Function and class templates - Exception handling – try-catch-throw paradigm – exception specification – terminate and Unexpected functions – Uncaught exception.

UNIT IV  INHERITANCE AND POLYMORPHISM  12

UNIT V  FILE HANDLING, STRINGS NAMESPACE AND STL  12

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
13IT35 DIGITAL SYSTEM DESIGN  

L T P C  
3 1 0 4  

COURSE OUTCOMES  
On Successful completion of this course, Students will be able to  
• Represent numerical values in various number systems and perform number conversions between different number systems.  
• Analyze and design digital combinational circuits including arithmetic circuits (half adder, full adder, multiplier).  
• Analyze Sequential and Logic Circuits.  

UNIT I  
NUMBER SYSTEM AND LOGIC GATES  
Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems- Boolean functions – Simplifications of Boolean functions using Karnaugh map- AND, OR, NOT, NAND, NOR, Exclusive-OR and Exclusive-NOR, Implementations of Logic Functions using gates.  

UNIT II  
COMBINATIONAL CIRCUITS  

UNIT III  
SEQUENTIAL CIRCUITS  

UNIT IV  
SYNCHRONOUS SEQUENTIAL LOGIC  

UNIT V  
ASYNCHRONOUS SEQUENTIAL LOGIC  
Design of fundamental mode and pulse mode circuits, incompletely specified State Machines, Problems in Asynchronous Circuits, Design of Hazard Free Switching circuits. Design of Combinational and Sequential circuits using VERILOG.  

L: 45 T: 15 TOTAL: 60 PERIODS  

TEXT BOOKS  

REFERENCES  
13IT36  ANALOG AND DIGITAL COMMUNICATION  L  T  P  C
3  0  0  3

COURSE OUTCOMES

On Successful completion of this course, Students will be able to
- Understand basic communications systems, particularly with application to noise-free Analog and digital communications.
- Develop the ability to compare and contrast the strengths and weaknesses of various Communication systems.
- Describe how information is put into electronic devices for storage and delivery.

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
Introduction, Pulse modulation, PCM - PCM sampling, sampling rate, signal to quantization noise rate, companding - analog and digital - percentage error, delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission - Intersymbol interference, eye patterns.

UNIT IV  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.

UNIT V  DATA AND OPTICAL COMMUNICATION  9

TOTAL: 45PERIODS

TEXT BOOKS

REFERENCES
13IT37 DATA STRUCTURES LABORATORY  L  T  P  C
0  0  3  2

COURSE OUTCOMES
On Successful completion of this course, Students will be able to
- Apply and implement learned algorithm design techniques and data structures to solve problems.
- Analyze and compare the efficiency of algorithm for a given problem.
- Design and analyze the time and space efficiency of the data structure

LIST OF EXPERIMENTS
1. Array Implementation of List ADT
2. Implementation of Singly Linked List
3. Implementation of Doubly Linked List
4. Represent a polynomial as a linked list and write functions for polynomial addition.
5. Write programs to implement the following using an array.
   a) Stack ADT   b) Queue ADT
6. Write programs to implement the following using a singly linked list.
   a) Stack ADT   b) Queue ADT
7. Implement Stack and use it to convert a given infix expression into postfix form.
8. Implement a double-ended queue (dequeue) when insertion and deletion operations are possible at both the ends.
9. Write programs that traverse the given binary tree in
   a) Preorder   b) inorder    and    c) postorder.
10. Write programs for implementing the following sorting methods with complexity analysis
    a) Merge sort   b) Quick sort    c) Heap sort
11. Write a program to perform the following operations:
    a) Insert an element into a binary search tree.
    b) Delete an element from a binary search tree.
    c) Search for a key element in a binary search tree.
12. Write a program to perform the following operations
    a) Insertion into an AVL-tree   b) Deletion from an AVL-tree
13. Implement priority queue using binary heaps.
15. Write programs for the implementation of BFS and DFS for a given graph.
16. Write a program for generating Minimum cost spanning tree using Prims’ algorithm.

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. (Min. Requirement: Pentium III or Pentium IV with 256 RAM and 40 GB harddisk)
13IT38  OBJECT ORIENTED PROGRAMMING USING C++ LABORATORY  

COURSE OUTCOMES

On Successful completion of this course, Students will be able to

- Impart their knowledge related to classes and objects
- Manipulate objects using friend functions
- Implement various features of object oriented programming
- Develop applications using file handling concepts

LIST OF EXPERIMENTS

1. Define a STUDENT class with Reg. No., Name and Marks in 3 tests of subject. Declare an array of 10 STUDENT objects. Using appropriate functions, find the average of two better marks for each student. Print the Reg. No., Name and average marks of all the students.

2. Create two classes DM and DB which stores the value of distances. DM stores distances in meters and centimeters and DB in feet and inches. Write a program that can read values for the class objects and add object of DM with another object of DB. Use friend function to carry out the addition operation. The object that stores the result may be a DM object depending on the units in which the results are required. The display should be in the format of feet and inches or meters and centimeters depending on the object of display.

3. Declare friend function in two classes. Calculate the sum of integers of both the classes using friend sum () function.

4. Create a class called MATRIX using a two-dimensional array of integers. Implement the following operations by overloading the operator == which checks the compatibility of two matrices to be added and subtracted. Perform the addition and subtraction by overloading the operators + and -. Display the result by overloading the operator <<.

5. Implement complex number class with necessary operator overloading and type Conversions such as integer to complex, double to complex, complex to double etc.

6. Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of assignment operator.

7. Overload the new and delete operators to provide custom dynamic allocation of memory.

8. Develop a template of linked-list class and its methods.

9. Develop templates of standard sorting algorithms such as bubble sort, insertion sort, merge sort, and quick sort.

10. Create a class called STUD with data members Reg. No., Name and Age. Using inheritance, create the classes UGSTUD and PGSTUD having fields a semester, fees and stipend. Enter the data for at least 5 students. Find the average age for all UG and PG students separately.
11. Design stack and queue classes with necessary exception handling.

12. 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.

13. 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.

14. 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).

MINI Projects:
   Employee payroll calculation, Hospital Management, Bank Management, Library Management, Attendance Calculation, Grade sheet Calculation, Railway Reservation System, Electricity Bill generation, Time table generation System, Inventory Control System

TOTAL: 45 PERIODS

LIST OF EQUIPMENTS AND SOFTWARE FOR A BATCH OF 35 STUDENTS

HARDWARE:
- 35 Personal Computers
- Processor – 2.0 GHz or higher
- RAM – 256 MB or higher
- Hard disk – 20 GB or higher

SOFTWARE:
- Microsoft Visual C++ 6.0 – to be installed in all PC’s.
- OS - Windows 2000/ Windows XP/ NT
13IT41      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 queueing system and acquire skills in analyzing queueing 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 Queueing models - Steady state results: Single and multiple server queueing 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
13IT42 ALGORITHM ANALYSIS AND DESIGN

L T P C
3 0 2 4

COURSE OUTCOMES
On Successful completion of this course, Students will be able to
- Demonstrate a familiarity with algorithm, asymptotic performance of algorithms and data structures.
- Master different algorithm design techniques (brute-force, decrease and conquer, divide and conquer)
- Master different algorithm design techniques (transform and conquer, dynamic programming)
- Master different algorithm design techniques (greedy, Iterative methods)
- Acquire basic knowledge of computational complexity algorithms.

UNIT I BASIC CONCEPTS AND MATHEMATICAL ASPECTS OF ALGORITHMS 12

UNIT II SORTING AND SEARCHING ALGORITHMS 12

UNIT III ALGORITHMIC SEARCH TECHNIQUES 12

UNIT IV GREEDY AND ITERATIVE ALGORITHMS 12

UNIT V ALGORITHM DESIGN METHODS 12

L: 45 P: 15 TOTAL: 60 PERIODS

TEXT BOOK

REFERENCES
13IT43 COMPUTER ARCHITECTURE L T P C
3 0 0 3

COURSE OUTCOMES
On Successful completion of this course, Students will be able to
- Discuss the basic structure and operation of a digital computer.
- Illustrate the sequence of micro-operations required to complete the execution of an instruction level machine language.
- Employ some of the techniques used to improve the performance of computer at the architectural point of view.
- Discuss several types of memory used in a computer their hierarchy and functions as part of the system.
- Explain the communication process with input and output devices and different mechanisms for interfacing with the peripheral units.

UNIT I BASIC STRUCTURE OF COMPUTERS 9

UNIT II BASIC PROCESSING AND ARITHMETIC UNIT 9

UNIT III PIPELINING 9
- Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling.

UNIT IV MEMORY SYSTEM 9

UNIT V I/O ORGANIZATION 9

TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES
13IT44 C# AND .NET FRAMEWORK

COURSE OUTCOMES
On Successful completion of this course, Students will be able to

• Gain programming skills in C# both in basic and various elements of OOPs.
• Build Web based Applications and Accessing Data with ADO.NET.
• Design in the concepts of the web Application development by using various web based GUI tools like web forms.
• Develop Web Applications with Web Services
• Build sample applications and large-scale projects.

UNIT I INTRODUCTION TO C# 12
C# and the .NET framework - Basics programming with C#, - Arrays, Strings, Structures, Enumerations, Classes, Objects.

UNIT II OBJECT ORIENTED ASPECTS OF C# 12

UNIT III WEB BASED APPLICATION DEVELOPMENT ON .NET 12
ASP.NET Introduction - Programming Web applications with Web Forms - Validation controls - ASP.NET Development - Custom Controls – Master Pages - ASP.NET AJAX.

UNIT IV ADO.NET 12

UNIT V WEB SERVICE AND .NET COMPACT FRAMEWORK 12

L: 45 P: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
13IT45 RELATIONAL DATABASE MANAGEMENT SYSTEMS  L  T  P  C
3 1 0 4

COURSE OUTCOMES
On Successful completion of this course, Students will be able to
- Develop an appreciation of the role of data, files and databases in information systems.
- Understand the data modeling concepts (E-R and Class diagrams) used in database development.
- Create databases and pose complex SQL queries of relational databases.
- Familiar with a broad range of data management issues including data integrity and security.
- Gain a working knowledge of developing and maintaining a small-scale database project.
- Formulate a working definition of database development and administration.

UNIT I  INTRODUCTION
Purpose of Database System - Views of data - Data Models - Database Languages - Database Architecture -
Database users and Administrator – Entity Relationship model (E-R model) - E-R Diagrams - Introduction to
relational databases.

UNIT II  RELATIONAL MODEL
Structure of Relational Databases-The relational Model - Keys - Relational Query Languages -Relational
Algebra - Domain Relational Calculus - Tuple Relational Calculus - Fundamental operations - Additional
Operations- SQL fundamentals - Integrity - Triggers - Security - Views – Introduction to Distributed Databases
and Client/Server Databases.

UNIT III  RELATIONAL DATABASE DESIGN
Features of Good Relational Designs - Functional Dependencies - First, Second, Third Normal Forms,
Dependency Preservation - Boyce/Codd Normal Form- Multi-valued Dependencies and Fourth Normal Form -
Join Dependencies and Fifth Normal Form

UNIT IV  TRANSACTION MANAGEMENT
- System Recovery-Media Recovery - Two Phase Commit - Save Points - Concurrency - Need for Concurrency
- Locking Protocols - Two Phase Locking - Deadlock- - Recovery Isolation Levels - SQL Facilities for
Concurrency.

UNIT V  DATA STORAGE AND QUERYING
Overview of Physical Storage Media - Magnetic Disks - RAID - Tertiary storage - File Organization -
Organization of Records in Files - Indexing and Hashing -Ordered Indices - B+ tree Index Files - B tree
Index Files - Static Hashing - Dynamic Hashing - Query Processing Overview - Catalog Information for Cost
Estimation - Selection Operation - Sorting - Join Operation-Query Optimization –Transformation of Relational
expressions.

L: 45  T: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
Pearson / Addision welsey, 2011.
Education, 2011.
COURSE OUTCOMES
On Successful completion of this course, Students will be able to
• Solve basic binary math operations using the microprocessor.
• Understand the programming proficiency using various addressing modes and data transfer instructions of the microprocessor.
• Apply knowledge of the microprocessor’s internal registers and operations by use of a PC based microprocessor simulator.

UNIT I 8085 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 ADVANCED MICROPROCESSOR

UNIT V I/O INTERFACING
Memory interfaces and I/O interfacing with 8085 - parallel communication interface - serial communication interface - timer-keyboard/display controller - interrupt controller - applications - stepper motor - temperature control.

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
13IT47 RELATIONAL DATABASE MANAGEMENT SYSTEMS LABORATORY

COURSE OUTCOMES

On Successful completion of this course, Students will be able to

• Create databases and pose complex SQL queries of relational databases.
• Gain experience developing a set of queries to handle a specified set of typical user inquiries for information extraction from the database.
• Familiar with a broad range of data management issues including data integrity and security.
• Demonstrate principles of design, development, and administration relevant to Oracle database technology.
• Gain a working knowledge of developing and maintaining a small-scale database project.

LIST OF EXPERIMENTS

1. Creation and Modification of relations
2. Integrity constraint enforcement
3. Nested Queries & Join Queries
4. Creation and Updation of Views
5. Exercises using PL/SQL
6. High level programming language extensions (Control structures, Procedures and Functions).
7. Creation of Triggers
8. Cursor management
9. Menu Design
10. Database Design and implementation (Mini Project).

TOTAL: 45 PERIODS

REFERENCE


LAB EQUIPMENTS  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.
13IT48 MICROPROCESSORS LABORATORY

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COURSE OUTCOMES
On Successful completion of this course, Students will be able to

- Work with 8085 and 8086 microprocessors.
- Work with standard microprocessor interfaces.

LIST OF EXPERIMENTS

1. Programming with 8085
2. Programming with 8086-experiments including BIOS/DOS calls:
4. Interfacing with 8085/8086-8255,8253
5. Interfacing with 8085/8086-8279,8251

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. Interfacing with 8086 - PC add-on cards with 8255, 8253, 8279 and 8251 - 15 nos.
4. Stepper motor interfacing module - 5 nos.
5. Traffic light controller interfacing module - 5 nos.
6. ADC, DAC interfacing module - 5 nos.
7. CRO's - 5 nos.

TOTAL: 45 PERIODS
13IT49 COMMUNICATION SKILLS AND TECHNICAL SEMINAR
(Common to all B.E. / B.Tech. Degree Programmes)

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
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.
2. Is it just to force people to retire?
3. Attitude decides one’s altitude in life.
4. Should an aspiring student go for a course which is in demand or for a course which he/she likes?
5. Is westernization a cultural degradation or enrichment?
6. Is Brain drain a threat to India?
8. Do Mobile phones spoil the youth?
9. No two generations see eye to eye- Discuss.
10. Is scientific advancement a boon or a bane?
11. Does ragging develop friendship?

D) SPEAKING ON THE GIVEN PICTURE/DIAGRAM/CHART/TABLE (5 hrs)

RECORD LAYOUT:
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