REGULATIONS – 2013

DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING

CURRICULUM AND SYLLABI OF

B.E. – COMPUTER SCIENCE AND ENGINEERING
NATIONAL ENGINEERING COLLEGE, K.R.NAGAR, KOVILPATTI
(An Autonomous Institution, Affiliated to Anna University, Chennai)

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 COMPUTER SCIENCE AND ENGINEERING

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)

By the time of graduation graduates will attain the following programme outcomes:

1. Apply knowledge of mathematics, natural science, engineering fundamentals and system fundamentals, software development, networking & communication, and information assurance & security to the solution of complex engineering problems in computer science and engineering.
2. Identify, formulate, research literature and analyse complex computer science and engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, engineering sciences, system fundamentals, software development, networking & communication, and information assurance & security.
3. Design solutions for complex computer science and engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems in networking & communication, and information assurance & security using research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
5. Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex computer science and engineering problems, with an understanding of the limitations.
6. Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice in system development and solutions to complex engineering problems related to system fundamentals, software development, networking & communication, and information assurance & security.
7. Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems related to system fundamentals, software development, networking & communication, and information assurance & security in societal and environmental contexts.
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of computer science and engineering practice.
9. Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
10. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.
12. Demonstrate knowledge and understanding of engineering management principles and economic decision making and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
## REGULATIONS 2013 – CURRICULUM AND SYLLABI

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

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

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<td>Comprehension</td>
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<td><strong>Total Number of Credits</strong>: 25</td>
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</table>

### Core Electives

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>13CSAA</td>
<td>Advanced Database Technology (Common to CSE and IT)</td>
<td>3</td>
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<td>2.</td>
<td>13CSAB</td>
<td>Advanced Java Programming</td>
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<tr>
<td>3.</td>
<td>13CSAC</td>
<td>Unix Internals</td>
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<td>4.</td>
<td>13CSAD</td>
<td>Neuro Fuzzy Systems</td>
<td>3</td>
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### Interdisciplinary Electives (Maximum of 2 Electives to be opted)

<table>
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<tr>
<th>S. No.</th>
<th>Course Code</th>
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<tbody>
<tr>
<td>1.</td>
<td>13CSBA</td>
<td>Social Computing (Common to IT, ECE and CSE)</td>
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<td>2.</td>
<td>13CSBB</td>
<td>Analytic Computing (Common to IT, ECE and CSE)</td>
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<td>3.</td>
<td>13CSBC</td>
<td>Cloud Computing (Common to IT, ECE, CSE and EEE)</td>
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<td>4.</td>
<td>13CSBD</td>
<td>High Speed Networks (Common to ECE, CSE and IT)</td>
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<td>5.</td>
<td>13CSBE</td>
<td>Service Oriented Architecture (Common to IT and CSE)</td>
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### Transdisciplinary Electives (Self Study)

(Maximum of 1 Elective to be opted)

<table>
<thead>
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<th>S. No.</th>
<th>Course Code</th>
<th>Course Title</th>
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<th>P</th>
<th>C</th>
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<tr>
<td>1.</td>
<td>13CSCA</td>
<td>Indian Society</td>
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<td>2.</td>
<td>13CSCB</td>
<td>World Culture in Film</td>
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<td>3.</td>
<td>13CSCC</td>
<td>Interpersonal Development</td>
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<td>4.</td>
<td>13CSCD</td>
<td>Leadership Communication</td>
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<td>5.</td>
<td>13CSCE</td>
<td>2030: Global Uncertainty Challenges</td>
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<td>6.</td>
<td>13CSCF</td>
<td>Non-Conventional Energy Resources</td>
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</table>
SH100  
TECHNICAL ENGLISH – I
(Common to all B.E. / B.Tech., Degree Programmes)

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
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 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
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 - Schrodinguer’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

UNIT II  ELECTRO ANALYTICAL TECHNIQUES
Electrode potential: definition, measurement of electrode potential, Nernst equation – problems; EMF: definition, measurement of EMF – Poggendorff’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
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

UNIT V  NANO MATERIALS
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)

L T P C
3 0 0 3

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)

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
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
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
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
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
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
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)

L T P C
0 0 3 2

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:  5
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:  6
Study of the joints in roofs, doors, windows and furniture.
Hands-on-exercise:
Wood work, joints by sawing, planning and cutting.

III  WELDING:  5
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:  7
(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

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
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 preparing letter of Job Application with annexure.

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 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

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**  

**UNIT II CORROSION AND ITS CONTROL**  

**UNIT III PHOTOCHEMICAL PROCESSES**  

**UNIT IV ELECTRONIC MATERIALS**  

**UNIT V ANALYTICAL INSTRUMENTATION**  

**TOTAL: 45 PERIODS**
TEXT BOOKS

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

L  T  P  C  
3  1  0  4 

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  12

UNIT II  TRANSIENT RESPONSE FOR CIRCUITS  12
Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and AC with sinusoidal input.

UNIT III  RESONANT CIRCUITS  12

UNIT IV  SEMICONDUCTOR DIODES  12

UNIT V  TRANSISTORS  12
Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and comparison of their characteristics – Breakdown in transistors – operation and comparison of N-Channel and P-Channel JFET - drain current equation – MOSFET – Enhancement and depletion types – structure and operation – comparison of BJT with MOSFET – thermal effect on MOSFET.

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS
REFERENCES
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 15

UNIT II BUILDING COMPONENTS AND STRUCTURES 15
Foundations: Types, Bearing capacity – Requirement of good foundations.

B – MECHANICAL ENGINEERING

UNIT III POWER PLANT ENGINEERING 10

UNIT IV IC ENGINES 10
Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler as a power plant.

UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM 10

TOTAL: 60 PERIODS

REFERENCES
13C26 COMPUTER PROGRAMMING LABORATORY
(Common to all B.E. / B.Tech., Degree Programmes)

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)

**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.
4. Determination of Radius of curvature of a Plano convex lens using
   Newton’s rings Method.
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^{2+} 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)

L T P C
0 0 3 2

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

UNIT IV  FOURIER TRANSFORMS                12

UNIT V  NUMERICAL METHODS                  12

L: 45 T: 15   TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
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
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 12

UNIT II TREE STRUCTURES 12

UNIT III BALANCED TREES 12

UNIT IV HASHING AND HEAPS 12

UNIT V GRAPHS 12

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
13CS35   OBJECT ORIENTED PROGRAMMING            L T P C
                  3 0 0 3

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                         9
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 9

UNIT III  INHERITANCE AND POLYMORPHISM         9

UNIT IV  TEMPLATES AND EXCEPTION HANDLING      9

UNIT V   I/O STREAMS                           9

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
Review of Number Systems – Number representation: Signed, Unsigned, Fixed point, Floating point.
Computer codes – BCD, Gray code, Excess 3 code, Error detection and correction codes, Parity, Hamming codes. Boolean algebra – Basic Postulates and theorems, Switching functions, Canonical forms, Logic gates. Simplifications of Boolean functions using Karnaugh map and tabulation methods

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  

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  

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 (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 news paper 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
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
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
Joint distributions - Marginal and conditional distributions – Covariance - Correlation and regression - Transformation of random variables.

UNIT III  MARKOV PROCESSES AND MARKOV CHAINS

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

TEXT BOOKS

REFERENCES
13CS42 DESIGN AND ANALYSIS OF ALGORITHMS L T P C
3 1 0 4

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 12

UNIT II PROBLEM SOLVING TECHNIQUES 12

UNIT III DYNAMIC PROGRAMMING 12

UNIT IV BACKTRACKING 12

UNIT V ANALYSIS OF GRAPH 12
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 L T P C 3 0 0 3

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 9

UNIT II THREADS, PROCESS SCHEDULING AND SYNCHRONIZATION 10

UNIT III DEADLOCK 8

UNIT IV STORAGE MANAGEMENT 9

UNIT V FILE SYSTEMS AND I/O SYSTEMS 9

TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES
13CS44     JAVA PROGRAMMING       L  T  P  C
17         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          12

UNIT II    MULTITHREADED PROGRAMMING IN JAVA     12

UNIT III   I/O AND EXPLORING JAVA.IO          12
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      12

UNIT V     JDBC, RMI AND SERVLETS          12

L: 45  T: 15  TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
13CS45 DATABASE MANAGEMENT SYSTEMS

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 9

UNIT II RELATIONAL MODEL 9

UNIT III DATABASE DESIGN 9

UNIT IV TRANSACTION MANAGEMENT 9

UNIT V DATA STORAGE AND QUERYING 9

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
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
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
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
Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets –Data path and control considerations –superscalar operations- Performance considerations.

UNIT IV MEMORY SYSTEM

UNIT V MULTIPROCESSOR

TEXT BOOKS

REFERENCES
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 L T P C
0 0 3 2

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

TOTAL: 45 PERIODS

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
13CS51 DISCRETE MATHEMATICS

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<thead>
<tr>
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<th>L</th>
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<td>3</td>
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<td>4</td>
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</table>

**COURSE OUTCOMES**

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

- **CO 1:** Formulate and interpret statements presented in normal forms and determine their validity by applying the rules and methods of propositional calculus.
- **CO 2:** Determine when a relation is reflexive, symmetric, anti symmetric, or transitive and apply the different properties of functions.
- **CO 3:** Apply fundamental counting algorithms to solve problems related to permutations, combinations and recurrence relations.
- **CO 4:** Explain the various concepts of Lattices.
- **CO 5:** Interpret the basic concepts of graphs in modeling and other applications.

**UNIT I LOGIC AND PROOFS**

Propositions and Logical operators – Truth table-Propositions generated by a set-Equivalence and implication – Basic laws-Some more connectives—Functionally complete set of connectives-Normal forms-Proofs in Propositional calculus.

**UNIT II SETS, RELATIONS AND FUNCTIONS**

Basic Definitions-Set operations – Laws of set theory – Partitions - Relations – Properties of relations – Matrices of relations – Closure operations on relations – Functions - injective, surjective and bijective functions.

**UNIT III COMBINATORICS**

The basics of counting – The pigeonhole principle - Permutations and combinations – Recurrence relations - Solving Linear recurrence relations – Generating functions - Principles of inclusion and exclusion.

**UNIT IV LATTICE THEORY**


**UNIT V GRAPH THEORY**

Graphs and graph models – Graph terminology and special types of graphs – Representing graphs and graph isomorphism - connectivity - Euler and Hamiltonian graphs.

L: 45 T:15 TOTAL:60 PERIODS

**TEXT BOOKS**


**REFERENCES**

13CS52  THEORY OF COMPUTATION  L T P C  3 1 0 4

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
CO 1: Understand the basics of finite automata and their capabilities.
CO 2: Construct finite state machines and the equivalent regular expressions.
CO 3: Construct and prove the equivalence of languages described by pushdown automata and
   context free grammars
CO 4: Prove the equivalence of languages described by Turing machines.
CO 5: Understand the key results in algorithmic computability and solvability of problems.

UNIT I  AUTOMATA  10
Finite Automata (FA) - Deterministic Finite Automata (DFA) - Non-deterministic Finite Automata
   (NFA) – Finite Automata with Epsilon transitions.

UNIT II  REGULAR EXPRESSIONS AND LANGUAGES  13
Regular Expression - FA and Regular Expressions - Proving languages not to be regular – Closure
   properties of regular languages - Equivalence and minimization of Automata.

UNIT III  CONTEXT-FREE GRAMMARS AND LANGUAGES  13
Context-Free Grammar (CFG) - Parse Trees - Ambiguity in grammars and languages – Definition of
   the Pushdown Automata - Languages of a Pushdown Automata - Equivalence of Pushdown Automata
   and CFG.

UNIT IV  PROPERTIES OF CONTEXT-FREE LANGUAGES  12
Normal forms for CFG - Pumping Lemma for CFL - Closure Properties of CFL – Turing Machines -
   Programming Techniques for TM: Subroutines.

UNIT V  UNDECIDABILITY  12
A language that is not Recursively Enumerable (RE) - An un-decidable problem that is RE-
   Undecidable problems about Turing Machine - Post’s Correspondence Problem.

L: 45 T: 15 TOTAL: 60 PERIODS

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

REFERENCES
1. Thomas A. Sudkamp, “An Introduction to the Theory of Computer Science, Languages and
COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
CO 1: Describe architecture and operations of microcontroller 8051
CO 2: Develop assembly language programs for 8051 and its applications in the field of information technology using different types of interfacing
CO 3: Acquire knowledge on embedded systems basics and describe the architecture and operations of ARM processor
CO 4: Develop skills in writing small programs for ARM processor and its applications using different types of interfaces and with interrupt handling mechanism
CO 5: Understand the multiple process operating environments and use standard system call interfaces to monitor and control processes

UNIT I   MICROCONTROLLER          14
Architecture of 8051–8051 microcontroller hardware-I/O Pins Ports and circuits-External memory-Counters and Timers-Serial data Input/output-Interrupts, Basic Assembly language programming-Tools and techniques - Programming the 8051 Instruction set-Addressing modes

UNIT II   INTERFACING MICROCONTROLLER                   11
LCD & Keyboard Interfacing -ADC, DAC & Sensor Interfacing-External Memory Interface-Stepper Motor and Waveform generation.

UNIT III EMBEDDED COMPUTING                    12
Challenges of Embedded Systems –Embedded system design process- Embedded processors –ARM processor –Architecture, Instruction sets and programming.

UNIT IV MEMORY AND I/O MANAGEMENT       12
Programming Input and Output –Memory system mechanisms –Memory and I/O devices and interfacing –Interrupts handling.

UNIT V PROCESSES AND OPERATING SYSTEMS                   11
Multiple tasks and processes – Context switching – Scheduling policies – Inter process communication mechanisms – Performance issues.

TEXT BOOKS

REFERENCES
13CS54 C# AND .NET TECHNOLOGIES L T P C
3 0 0 3

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Perceive awareness about .NET Environment.
CO 2: Develop C# program based on the features of .Net Framework.
CO 3: Identify the file types and serialization mechanisms in C#.
CO 4: Demonstrate the applications of XML in .NET and ADO.NET.
CO 5: Build web pages using ASP.NET with session management.

UNIT I OVERVIEW OF .NET 8
Building blocks of .Net platform – Type system - Language specification - Type distinction –
Runtime deployment - .Net aware programming languages - Independent nature of .NET

UNIT II CONCEPTS OF C# 10
Data types – Arrays-Strings-Control Statements-Classes and Objects- this keyword – Static Keyword -
Namespace - Inheritance –Interface-Polymorphism: Method Overloading- Operator Overloading –
Property – Indexes – Delegates - Exception handling.

UNIT III FILE I/O AND OBJECTS 9
Directory and file types – Programming with file I/O – Object serialization – Configuration of objects –
Serialization mechanisms.

UNIT IV ADO.NET 9
ADO.NET Architecture - ADO.NET- Connected Layer: Data Provider Model-Data Readers - Data
Transaction - Disconnected layers: Dataset- Data Column- Data Row- Table Data.

UNIT V ASP.NET 9
Building ASP.NET web pages – ASP.NET web controls – Master pages – Themes – State
management: Session data – Cookies.

L: 45 TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES
COURSE OUTCOMES
Upon completion of this course, the students will be able to
CO1: recognize the core values that shape the ethical behavior of an engineer
CO2: expose awareness on professional ethics and human values.
CO3: distinguish their role in technological development

UNIT I HUMAN VALUES 9

UNIT II ENGINEERING ETHICS 9

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION 9
Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS 9

UNIT V GLOBAL ISSUES 9
Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors - Moral leadership-sample code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers (IETE), India, etc.

TEXT BOOKS

REFERENCES
13CS57 MICROCONTROLLER AND EMBEDDED SYSTEMS LABORATORY  L T P C 0 0 3 2

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Acquire the basic knowledge of Arithmetic operations using 8051 microcontroller kit
CO 2: Analyze the various interface techniques
CO 3: Develop embedded programming in C language and apply real-time systems design
techniques to various software programs.
CO 4: Utilize a top-down modular design process to complete a medium complexity embedded
system design project under instructor specified design constraints.

LIST OF EXPERIMENTS
1. Basic Arithmetic operations using 8051 microcontroller kit
2. Design with 8051 Microcontrollers: I/O programming, ADC/DAC, Timers, Interrupts, Serial
port
3. To rotate motor in clockwise direction and anticlockwise direction for infinite number of
times
4. Develop Assembly language programs using Keil software
5. I/O porting on ARM Processor for external peripheral devices using High level language
programming
6. Transmission from Kit and reception from PC using Serial Port
7. Mini Projects (implementation of a wireless communication protocol on an embedded
system) (a group of students would be required to work on an any one of following embedded
system design project) Though the emphasis would be on implementation, they would be
required to go through all aspects of system design including drawing up proper specifications
as well as evaluation of alternatives.
   i. Design of Vehicle Positioning System based on Arm.
   ii. Anti Theft Control System Design using embedded system.
   iii. The Design of Total Station Handhold Device based on Arm
   iv. Design and Implementation of the Lab Remote Monitoring System Based on
   Embedded Technology.
   v. Microcontroller based automation of variable electronic speed governor
   vi. The Intelligent Embedded control warning system for car reversing
   vii. Real-time temperature measuring system for the joint less rail
   viii. Wheel chair pressure monitors alert system for the reduction of the
       occurrence of pressure sores.

LIST OF EQUIPMENTS AND COMPONENTS

HARDWARE
• 8051 Trainer Kit

SOFTWARE
• Keil µVision3-IDE(MDK 3ola)( www.keil.com/µvision/)
• Open source(Ubuntu)-GCC

P:45 TOTAL: 45 PERIODS
13CS58  C# and .NET TECHNOLOGIES LABORATORY  L T P C  0 0 3 2

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Demonstrate the fundamental concept of C# and .NET
CO 2: Experiment and examine runtime errors using exception Handling
CO 3: Create database using ADO.NET
CO 4: Model .NET components in a windows form based applications
CO 5: Design online applications using ASP .NET

LIST OF EXPERIMENTS

1. Develop a polymorphic banking program using Account hierarchy. Create class for SavingsAccount and CheckingAccount. For each Account, allow the user to specify an amount of money to withdraw from the Account and an amount of money to deposit into the Account. While processing each Account, determine its type. If an Account is a SavingsAccount, calculate the amount of interest owed to the Account using member function calculateInterest, and then add the interest to the account balance. After processing an Account, print the updated account balance obtained by invoking base class member function getBalance.

2. Develop an Insurance application which calculates interest of an applicant under various insurance policy schemes like pension plans, health plans, individual plans, group schemes and also choose the best insurance policy according to the customer requirement. Allow the applicant to join in more than one scheme and calculate his premium on yearly basis or monthly basis using multiple inheritance.

3. Develop an application that allows the user to buy and sell stock by setting a buy value and a sell value using Delegates and events.

4. Develop a library system and handle all the possible exceptions which occur in cataloging and circulation of books, journals, CDs.

5. Write a program to demonstrate file conversion. Convert a binary file to a text file.

6. Develop an employee database for an organization to store information about employees, departments and project associated with the employees. Employees work in departments and each department is managed by an employee. When a project is completed the associated employees table should be updated accordingly. Design a normalized table to perform the described actions. Use database wizards and tools that read, display, and allow viewing and editing a specific table in a database. Note: The attributes of employee table includes ssn, salary, address and phone number, department table includes dno, dname and current project, project table includes pno, pname, project duration, associated employee, budget.

7. Develop a payroll processing application which calculates the wages of employees at all level. Calculate Overtime Rate, Gross Pay and Net Pay of employees and display all the necessary information of an employee in the user interface. Use standard Windows controls to create a user interface. Note: Consider the employee income tax deduction, paid and non paid vacations while calculating the employee salary.

8. Create a web application with consistent look on all the pages, forms and controls.

9. Create a client login page for a voter ID registration system, design a server page which stores the client information and display the session details on request

10. Mini Projects (As per SRS guidelines)
    a. Develop an online shopping application
    b. Develop an online banking application
    c. Develop an online education system
    d. Develop an online ticket reservation System
    e. Develop an online inventory management system
    f. Develop an online expert counseling system
g. Develop an online passport application system
h. Develop an online examination system
i. Develop an online bus tracking system

P: 45 TOTAL: 45 PERIODS

SUGGESTED SOFTWARE TOOLS

Operating System: Windows XP
Frontend: Microsoft Visual Studio
Backend: Oracle 9i/SQL Server/MySQL
13CS61  PRINCIPLES OF MANAGEMENT  L T P C
(13CS61, 13EE71, 13EI71, 13EC81, 13CE81, 13IT81, 13ME71)
(Common to all branches)

COURSE OUTCOMES
Upon completion of this course the students will be able to

CO1: Discuss the development of management thoughts and different types of Business Organization.
CO2: Practice the process of planning and decision making in an industrial situations.
CO3: Design the suitable selection process for a particular job description.
CO4: Apply different motivational techniques and leadership skills in the organization.
CO5: Justify the various controlling techniques and tools in the organization.

UNIT I  INTRODUCTION  9

UNIT II  PLANNING  9

UNIT III  FUNCTIONAL AREA OF ORGANISATION  9

UNIT IV  DIRECTION  9

UNIT V  CONTROLLING STRATEGIES  9

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
13CS62  INTERNET AND WEB TECHNOLOGY  L  T  P  C
(In Collaboration with InfoSys)  3  0  0  3
(Common to CSE, ECE and IT)

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
CO 1: Understand the complexity of the real world objects
CO 2: Learn the best practices for designing Web forms and Usability Reviews
CO 3: Understand the Principles behind the design and construction of Web applications
CO 4: Develop and Deploy an Enterprise Application

UNIT I  REVIEW OF OBJECT ORIENTED CONCEPTS  7
Objected oriented concepts – object oriented programming (review only) — advanced concept in
OOP – relationship – inheritance – abstract classes – polymorphism – Object Oriented design

UNIT II  INTERNETWORKING  9
firewalls – Client/Server concepts - World Wide Web – components of web application – MIME
types, browsers and web servers – types of web content – URL – HTML – HTTP protocol – Web
applications – performance – Application servers – Web security. User Experience Design – Basic
UX terminology – UXD in SDLC – Rapid prototyping in Requirements.

UNIT III  CLIENT BASED TECHNOLOGIES  9
Client Tier using HTML – Basic HTML tags – Look and feel using CSS – Client side scripting using
Java Script and Validations - Document Object Model (DOM).

UNIT IV  WEB DATABASE PROGRAMMING  10
Business tier using POJO (Plain Old Java Objects) – Introduction to Frameworks – Introduction to

UNIT V  SERVER BASED TECHNOLOGIES  10
Presentation tier using JSP – Role of Java EE in Enterprise applications – Basics of Servlets - To
introduce server side programming with JSP - Standard Tag Library.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
2. http://www.w3.org/
7. Developing Web Applications with JavaServer Faces found online at
8. Short introduction to log4j found online at http://logging.apache.org/log4j/1.2/manual.html
11. http://www.junit.org/
12. Marty Hall and Larry Brown, Core Servlets and JavaServer Pages Vol.1: Core Technologies

14. The Complete reference - JSP

15. Servlet Tutorial can be found online at http://java.sun.com/docs/books/tutorial


17. JSF Tutorial can be found online at

http://java.sun.com/j2ee/1.4/docs/tutorial/doc/JSFIntro.html
13CS63 SOFTWARE ENGINEERING METHODOLOGIES L T P C
3 0 0 3

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Identify appropriate software design model based on requirement analysis.
CO 2: Formulate Software Requirements Specification (SRS) reports for the real world
application
CO 3: Translate a specification into a design, and identify the components to built the architecture
CO 4: Plan a software engineering process to account for quality issues and non-functional
requirement
CO 5: Estimate the work to be done, resources required and the schedule for a software project
plan

UNIT I INTRODUCTION TO SOFTWARE ENGINEERING
Introduction: Definition of terms - The Evolving role of software - Software characteristics - Software
applications - Software myths. The Software process: A generic view of process. Process models:
Prescriptive Models - Water fall model – Incremental process model – Specialized process models.

UNIT II SOFTWARE PROJECT ANALYSIS
System engineering: Computer based system – System engineering hierarchy – Business process
engineering – Product engineering – System modeling. Requirements engineering: Requirements
engineering tasks – Initiating the requirements engineering process – Negotiating and validating
requirements.
Analysis modeling: Analysis modeling approaches – Data modeling concepts – Flow oriented
modeling – Behavioral model.

UNIT III SOFTWARE DESIGN CONCEPTS
Design engineering: Design in the context of software engineering – Design process and design
quality. Creating architectural design: Software architecture – Data design – Architectural styles and
design. Modeling Component level design: Component - Conducting component design. Golden rules
of User Interface design.

UNIT IV IMPLEMENTATION ISSUES
Implementation issues: Introduction – Structured coding techniques – Coding style – Standards and
process – Software scope and feasibility – Resources – Software project estimation – Decomposition
techniques – Empirical estimation models.

UNIT V PROJECT SCHEDULING AND CHANGE MANAGEMENT
Project scheduling: Basic concepts – Project scheduling – Defining a task set for software project.
Risk Management: Risk mitigation, monitoring and management. Change management: Software
Configuration Management – SCM repository and process.

L: 45 TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES
# 13CS64 PRINCIPLES OF COMPILER DESIGN

| CO 1: Analyze the source program and recognize the tokens |
| CO 2: Illustrate and compare the various types of parser and their role for the design of compiler. |
| CO 3: Generate three address code from the given program code |
| CO 4: Generate code from directed acyclic graphs |
| CO 5: Optimize the source code using suitable code optimization techniques |

## COURSE OUTCOMES

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

<table>
<thead>
<tr>
<th>UNIT I LEXICAL ANALYSIS 11</th>
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<tbody>
<tr>
<td>Introduction to Compiling - Compilers-Analysis of the source program - The phases – Cousins - The grouping of phases - Compiler construction tools. The role of the lexical analyzer - Input buffering - Specification of tokens - Recognition of tokens.</td>
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<tr>
<th>UNIT II SYNTAX ANALYSIS 13</th>
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<tbody>
<tr>
<td>Syntax Analysis - The role of the parser - Context-free grammars - Writing a grammar – Top down parsing - Bottom-up Parsing - LR parsers. Type Checking - Type Systems - Specification of a simple type checker.</td>
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<tr>
<th>UNIT III INTERMEDIATE CODE GENERATION 12</th>
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<tr>
<td>Intermediate languages – Declarations - Assignment statements - Boolean expressions - Case statements – Backpatching - Procedure calls.</td>
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<tr>
<th>UNIT IV CODE GENERATION 12</th>
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<tbody>
<tr>
<td>Issues in the design of a code generator - The target machine - Run-time storage management - Basic blocks and flow graphs - Next-use information - A simple code generator - Register allocation and assignment - The Directed Acyclic Graph (DAG) representation of basic blocks - Generating code from DAGs.</td>
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<tr>
<th>UNIT V CODE OPTIMIZATION 12</th>
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</table>

## TEXT BOOK


## REFERENCES

4. [http://dinosaur.compilertools.net](http://dinosaur.compilertools.net)
5. [http://epaperpress.com/lexandyacc](http://epaperpress.com/lexandyacc)
13CS65  NETWORK SECURITY  L T P C
3  1  0  4

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Identify the various attacks and its issues.
CO 2: Learn usage of cryptographic algorithms for avoiding basic level threats.
CO 3: Comprehend the issues involved in Integrity, Authentication and Key Management techniques.
CO 4: Realize the importance of user authentication and Kerberos concepts.
CO 5: Acquire the knowledge of network security and its applications.

UNIT I INTRODUCTION 12

UNIT II SYMMETRIC AND ASYMMETRIC KEY ALGORITHMS 12
Principle of Symmetric and Asymmetric key algorithms - Stream and Block Ciphers - RC4 - Data Encryption Standards (DES) - Advanced Encryption Standard (AES), Rivest Shamir Adleman(RSA) algorithm.

UNIT III AUTHENTICATION AND KEY MANAGEMENT 12

UNIT IV USER AUTHENTICATION AND KERBEROS 12

UNIT V NETWORK SECURITY AND ITS APPLICATIONS 12
Firewalls - Secure Socket Layer (SSL) - Transport Layer Security (TLS) - Secure Electronic Transaction (SET) - Security: E-mail.

L: 45 T: 15 TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES
COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Understand the basic concepts of cryptographic and network security algorithms.
CO 2: Experiment and analyze important cryptographic algorithms.
CO 3: Experiment security algorithms with efficiently implement key exchange algorithm.
CO 4: Configure the mail agent, firewall and secure shell (SSH) for providing secure
environment.
CO 5: Install and explain the purpose of a protocol analyzer (Wireshark and Snort).
CO 6: Perform basic protocol data unit (PDU) capture, analysis and display filtering using
Wireshark features.

LIST OF EXERCISES
1. Implementation of DES and IDEA Algorithms as per the following requirement shown in the
figure.

2. Implementation of AES and Asymmetric RSA algorithm.


4. Study of SHA-1 and MD5 hash function and implement the hash code using SHA-1 and hash
code using MD5.

5. Authentication using Digital Signature Algorithm - Configure a mail agent to support Digital
Certificates, send a mail and verify the correctness of this system using the configured
parameters.
6. Configure a firewall to block the following for 5 minutes and verify the correctness of this system using the configured parameters:
   a. Two neighborhood IP addresses on your LAN
   b. All ICMP requests
   c. All TCP SYN Packets

7. Configure SSH (Secure Shell) and send/receive a file on this connection to verify the correctness of this system using the configured parameters.

8. Case Study on Wireshark Installation and Setup.

9. Perform basic PDU capture, analysis and display filtering for a simple scenario using Wireshark.

10. Examine how networking packets are transferred and exchanged in a TCP/IP network. Student will develop an understanding of the protocols in packets transfer and corresponding protocols like Address Resolution Protocol (ARP), and Internet Control Message Protocol (ICMP) using Wireshark software.

11. Case Study on Snort Installation and Setup.

12. Perform Simple experiments using the sniffer mode, the packet logger mode, and the Network Intrusion Detection mode of Snort.

P:45 TOTAL: 45 PERIODS

Note:
- The first four exercises (1- 4) have to be implemented in Ubuntu 12.04 using C language.
- The exercises 5, 6 and 7 have to be implemented using built-in utilities available in Ubuntu 12.04.

List of Equipments and Components for a batch of 30 Students (Per Batch)

HARDWARE
- 30 Systems with core i3 Processor

SUGGESTED SOFTWARES
- Operating System - Linux (Ubuntu 12.04)
- Wireshark
- Snort or WinIDS AIO software pack

REFERENCES
2. http://elc.fhda.edu
13CS68  INTERNET AND WEB TECHNOLOGY LABORATORY          L T P C
 (In Collaboration with InfoSys)                            0 0 3 2
 (Common to CSE and IT)

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Understand, analyze and apply the role of languages HTML, Javascript, JSP in the
workings of the web and web applications
CO 2: Analyze a web page and identify its elements and attributes.
CO 3: Able to develop web pages using JDBC
CO 4: Able to build web applications using JSP.
CO 5: Develop and Deploy an Enterprise Application.

LIST OF EXERCISES
1. Develop a java application for Bank Transaction with different constraints.
2. Develop a java program to get employees details with given constraints.
3. Analyze and design the java code for given problems.
5. Implement Body Mass Index Calculator.
6. Simpsons Database: There is a database for Springfield Elementary School with the following
tables:
   a. Courses(id, name, teacher_id)
   b. Grades(student_id, course_id, grade)
   c. Students(id, name, email, password)
   d. Teachers(id, name)
7. World Database: There is a world database with the following tables:
   Countries (code, name, continent, surface_area, population, life_expectancy, gnp, ...)
   Cities (id, name, country_code, district, population)
   CountriesLanguages(country_code, language, official, percentage)
8. Design a web page for an Online voting Form with various HTML components.
9. Design a web page for an Email Registration Form with various HTML components. Develop
   a Servlet application to receive the email registration information and store the details into a
   table.
10. Design a web page for integrating the RMI server program to find minimum and maximum of
    three numbers send by the client program. Design a GUI Form for the RMI client to collect
    three numbers and display the result of minimum, maximum using Text Field.
11. Mini Project.

P: 45 TOTAL: 45 PERIODS

LIST OF EQUIPMENTS AND COMPONENTS

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Course</th>
<th>S/W on Students Machine</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>OOC (Java)</td>
<td>Eclipse 3.2</td>
</tr>
<tr>
<td>2.</td>
<td>Client tier (HTML/JS) &amp; Business tier (JDBC)</td>
<td>Eclipse 3.2</td>
</tr>
<tr>
<td>3.</td>
<td>Presentation tier (JSP)</td>
<td>Tomcat server in Eclipse 3.2</td>
</tr>
</tbody>
</table>

An alternate Software requirement can be WAMPP (Windows, Apache, MySQL, Perl / PHP)
combination. WAMPP is an open source package, hence free too.
13CS69 COMPREHENSION L T P C 0 0 3 1

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Pursue their higher education and research.
CO 2: Undergo GATE, GMAT like entrance exams.
CO 3: Evaluate the comprehensive knowledge being acquired through core engineering courses.
CO 4: Develop Aptitude and analytical skills towards placement.

I. COURSE CONTENT AND LAYOUT
The students will select a particular SIG (Special Interest Group) of subjects as mentioned below to review their competency level:

SIG 1: Computing
It is a Goal-oriented activity requiring, benefiting from, or creating algorithmic processes e.g. through computers.
- Data Structures and Algorithms
- Compiler Design
- Digital Logic Design
- C and OOP Programming
- Theory of Computation

SIG 2: Networking
It is to interact with others to exchange information and develop professional or social contacts.
- Computer Networks
- Web Technology
- Operating System
- Computer Organization and Architecture
- Social Networks

SIG 3: Data Analytics
It is the science of examining raw data with the purpose of drawing conclusions about that information.
- Database Management Systems
- Software Engineering
- Distributed Computing
- Advanced Database Technology
- Data Warehouse and Data Mining

II. ASSESSMENT PROCEDURE
- The staff-coordinator per group is responsible for scheduling the session plans, monitoring the activities and recording the continual assessments.
- The technical seminars, group discussions and comprehensive viva will be conducted and assisted by subject experts in the department.

1. Technical Seminars: Each student will be required to make one technical presentation for minimum 15 minutes duration in this course. Individual topics will be assigned to the students by the department.
2. Group Discussion: Assessment must focus on evaluating Team spirit and Body Language of student’s participation.
3. Comprehensive Viva: Viva should be handled on their area of interest in both written / oral mode.
- Each student must participate in the suggested activities and their performance assessment must be recorded.
Suggested Activities for improving placements:

1. Written Test:
   a. Verbal
      • Synonyms
      • Antonyms
      • Sentence completion
      • Passage writing
   b. Aptitude
      • Quantitative and Logical
   c. Analytical
      • Critical Reasoning

2. Mock Interviews:
   a. Pure HR Panel:
      • Communication Skills
      • Attitude
      • Interpersonal Skills
      • Openness to learn
      • Eligibility Check
      • Stress test
      • Co-curricular achievements
      • Extra-curricular achievements
   b. Management Interview:
      • Industry Orientation
      • Industry Trends
      • Career Goals
      • Adaptability
      • Culture Fitment
   c. Tech Panel:
      • Programming languages you know about.
      • Data Structures
      • Project related
      • Subject knowledge
      • Practical applicability of basic concepts
      • Certifications
      • Problem Solving

Suggested Activities for Encouraging Higher Studies

1. Mock GATE Examination
   • Solving previous year question papers
   • Objective type test for Aptitude and Verbal practices.

2. Technical Review
   To comprehend the core engineering concepts
   • Debate
   • Presentation
   • Technical Report

P:45 TOTAL: 45 PERIODS
13CSAA ADVANCED DATABASE TECHNOLOGY
(Common to CSE and IT)

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to

CO 1: Understand about different database system architectures.
CO 2: Identify the various databases such as distributed, parallel and object oriented databases.
CO 3: Develop in-depth knowledge about web and intelligent database.
CO 4: Understand the data storage structure in emerging information systems.

UNIT I  INTRODUCTION          8
Database System Architectures: Centralized and Client-Server Architectures - Parallel Systems –
Distributed Systems – Network Types.

UNIT II  DISTRIBUTED AND PARALLEL DATABASES                 9
Distributed Database Concepts: Homogeneous and Heterogeneous Databases - Distributed Data
Storage - Distributed Query Processing - Distributed Transactions – Commit Protocols – Concurrency
Control - Recovery.
Parallel Databases: Inter and Intra Query Parallelism – Inter and Intra operation Parallelism – Design
of Parallel Systems.

UNIT III   OBJECT ORIENTED DATABASES
Concepts of Object Oriented Databases - ODMG Model – Object Definition Language - Object Query
Language – Conceptual Design - Object Relational features in SQL, Oracle.

UNIT IV   INTELLIGENT DATABASES
Active Databases Concepts and Triggers - Deductive Databases - Temporal Database - Spatial
Databases - Data Mining: Overview.

UNIT V  EMERGING DATABASE TECHNOLOGIES AND APPLICATIONS                10
Mobile Database. Multimedia Databases. Geographic Information Systems. Genome Data
Management.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS
Education, Addison Wesley, 2010. (Unit – III, IV & V)

REFERENCE
1. Thomas Connolly and Carlolyn Begg, “Database Systems, A Practical Approach to Design,
13CSAB  ADVANCED JAVA PROGRAMMING  L  T  P  C
3  0  0  3

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Understand advanced Java programming concepts like collections, swing etc
CO 2: Develop network programs in Java.
CO 3: Understand distributed programming techniques in java.
CO 4: Understand Java database connectivity and develop web applications using JSP and Servlets.
CO 5: Design and develop enterprise applications.

UNIT I   JAVA BASICS REVIEW          9

UNIT II  NETWORK PROGRAMMING IN JAVA                  9

UNIT III   APPLICATIONS IN DISTRIBUTED ENVIRONMENT                 9

UNIT IV   MULTI-TIER APPLICATION DEVELOPMENT                   9

UNIT V   ENTERPRISE APPLICATIONS                               9

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
13CSAC UNIX INTERNALS  

L T P C  
3 0 0 3  

COURSE OUTCOMES  
Upon Successful completion of this course, the students will be able to  
CO 1: Explore the design concepts of UNIX OS  
CO 2: Learn the buffer representation, kernels and system calls.  
CO 3: Identify with appropriate system calls and file system  
CO 4: Understand the system process management and process control.  
CO 5: Gain knowledge on UNIX segmentation, paging and disk drivers  

UNIT I OVERVIEW OF UNIX OS  

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

UNIT III FILE SYSTEM  

UNIT IV PROCESS MANAGEMENT AND CONTROL  

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

L:45 TOTAL: 45 PERIODS  

TEXT BOOK  

REFERENCES  
13CSAD  NEURO FUZZY SYSTEMS  

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

CO 1: Acquire basic concepts in Fuzzy set operations, fuzzy relations, and fuzzy inferences.
CO 2: Realize the significance of Fuzzy Systems for learning the variability in models.
CO 3: Familiarize variety of Neural Network structures and its learning principles.
CO 4: Appreciate the Neuro-Fuzzy System development cycle with tuning and deployment.
CO 5: Demonstrate the real-world applications of Neuro-Fuzzy Systems.

UNIT I  FUZZY LOGIC  

UNIT II  FUZZY SYSTEMS FOR CLASSIFICATION  

UNIT III  NEURAL NETWORKS  

UNIT IV  NEURO FUZZY MODELING  

UNIT V  NEURO FUZZY CONTROL APPLICATIONS  

L: 45 TOTAL:45 PERIODS

TEXT BOOKS

REFERENCES
13CSAE  DISTRIBUTED COMPUTING  L T P C

3 0 0 3

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to

CO 1: Acquire the theoretical and conceptual foundations of distributed computing.
CO 2: Conceptualize the ideas of distributed operating systems and its issues.
CO 3: Understand the issues involved in distributed resource environment
CO 4: Realize the importance of transaction and how to recovery the system from deadlocks.
CO 5: Explore the principles of fault tolerance and its protocols.

UNIT I  DISTRIBUTED ENVIRONMENT

UNIT II  DISTRIBUTED OPERATING SYSTEMS

UNIT III  DISTRIBUTED RESOURCE MANAGEMENT
Distributed Shared Memory – Data-Centric Consistency Models – Client-Centric Consistency Models – Ivy – Munin – Distributed Scheduling – Distributed File Systems – Sun NFS.

UNIT IV  DISTRIBUTED TRANSACTION PROCESSING

UNIT V  FAULT TOLERANCE AND CONSENSUS

L:45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
13CSAF                     COMPUTATIONAL GRAPH THEORY                         L T P C
                                                3 0 0 3

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
   CO 1: Comprehends the graphs as a modeling and analysis tool in computer science &
          Engineering.
   CO 2: Illustrate the structures such as graphs & trees and techniques of counting and
          combinations.
   CO 3: Apply the concepts in number theory based computing and network security studies in
          Computer Science.

UNIT I  INTRODUCTION                                    9
Components – Euler graphs – Hamiltonian paths and circuits – Trees – Properties of trees – Distance
and centers in tree.

UNIT II  TREES, CONNECTIVITY AND PLANARITY        9
Spanning trees – Fundamental circuits – Spanning trees in a weighted graph – cut sets – Properties of
cut set – All cut sets -Connectivity and separability – Network flows – Combinational and geometric
graphs – Planer graphs –Representation of a planer graph.

UNIT III  MATRICES, COLOURING AND DIRECTED GRAPH                                   8
Chromatic number – Chromatic partitioning – Chromatic polynomial – Matching – Covering – Four
color problem – Directed graphs – Types of directed graphs – Digraphs and binary relations –
Directed paths and connectedness.

UNIT IV  PERMUTATIONS AND COMBINATIONS                                9
Fundamental principles of counting - Permutations and combinations - Binomial theorem -
Combinations with repetition - Combinatorial numbers - Principle of inclusion and exclusion.

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

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS
1. Narsingh Deo, Graph Theory: With Application to Engineering and Computer Science,
2. Ralph P.Grimaldi , Discrete and Combinatorial Mathematics: An Applied Introduction,

REFERENCES
COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
CO 1: Provide a conceptual overview to the tools of game theory and some of its applications.
CO 2: Incorporate the concepts of Game theory in Wireless Network Applications.
CO 3: Analyze situations in which two or more individuals (or firms, political parties, countries) interact in a strategic manner.
CO 4: Help better understand situations involving conflict and/or cooperation.

UNIT I  STATIC GAMES OF COMPLETE INFORMATION  9

UNIT II  DYNAMIC GAMES WITH COMPLETE INFORMATION  9
Extensive Form Games – strategies and equilibrium in extensive form games - Backward Induction and sub game perfection.

UNIT III  STATIC GAMES OF INCOMPLETE INFORMATION  9
Bayesian Games – Bayesian Nash Equilibrium - Applications

UNIT IV  DYNAMIC GAMES WITH INCOMPLETE INFORMATION  9
Perfect Bayesian Equilibrium – Signaling Games – Applications

UNIT V  APPLICATIONS FOR WIRELESS NETWORKS  9

L:45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
13CSAH        BUSINESS INTELLIGENCE AND ITS APPLICATIONS                L T P C
             (Common to CSE, ECE and IT)       3 0 0 3

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to,
CO 1: Develop a foundation in Business Intelligence (BI) for Business Analysis.
CO 2: Understand the different aspects of the BI environment, and key success factors.
CO 3: Understand Technology enabling process in an organization.
CO 4: Identify and analyze the new Techniques in BI.
CO 5: Be able to apply the techniques in the context of a business problem.

UNIT I        INTRODUCTION TO BUSINESS INTELLIGENCE                 9
Business intelligence and its impact - Factors driving Business Intelligence – Business Intelligence and Related Technologies – Case Study - Obstacles to Business Intelligence.

UNIT II       BUSINESS INTELLIGENCE CAPABILITIES                  9

UNIT III      TECHNOLOGY ENABLING BUSINESS INTELLIGENCE           9
Technology enabling Organizational Memory – Information Integration – Enabling Insights and Decision – Enabling Presentation - OLAP Cube, Data Slice and Dice - BI in Practice - Performance Dashboards - Balanced Scorecards - IT Governance - Case Study.

UNIT IV       BUSINESS INTELLIGENCE IMPLEMENTATION: INTEGRATION AND EMERGING TRENDS 9

UNIT V        MANAGEMENT AND FUTURE OF BUSINESS INTELLIGENCE     9
Development of BI - Business Intelligence System - Reporting system - Data Warehouse - Data Mart - Knowledge Management Systems - Discussion and Case Study – The Future of Business Intelligence.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
13CSAJ  WINDOWS INTERNALS  L T P C
             3 0 0 3

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Identify the concepts and tools of Windows.
CO 2: Understand the internal architecture and mechanism of Windows.
CO 3: Discuss the concepts of process management.
CO 4: Describe the components of I/O systems.
CO 5: Analyse the working of file systems.

UNIT I  INTRODUCTION  9
Concepts and Tools : Windows operating System Versions - Foundation Concepts and Terms:
Windows API - Services, Functions and Routines - Processes - Threads and Jobs - Virtual Memory
- Kernel Mode vs User Mode - Terminal Services and Multiple Sessions - Objects and Handles -
Unicode - Digging into Windows Internals - Kernel Debugging - Windows Software Development
Kit - Windows Driver Kit - Sysinternals Tools.

UNIT II  SYSTEM ARCHITECTURE AND MECHANISMS  9
Requirements and Design Goals – Operating System Model – Architecture Overview – Key System
Components – Trap Dispatching – Object Manager – Hypervisor.

UNIT III  PROCESS MANAGEMENT MECHANISMS  9
Registry – Services – Process Internals: Data Structures – Protected processes – Flow of Create

UNIT IV  I/O SYSTEMS  9
I/O System Components - Device Drivers – I/O processing – Kernel-Mode Driver Framework
(KMDF) - User-Mode Driver Framework (UMDF) - The Plug and Play Manager – The Power
Manager.

UNIT V  FILE SYSTEMS  9
Windows file system formats - File System Driver Architecture - Troubleshooting File System
Problems – NTFS design goal and features - NTFS drivers - NTFS On-Disk Structure.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS
   2012. [Units 1,2 &3]
   2012. [Units 4 & 5]

REFERENCE
1. Mark Russinovich, Aaron Margosis, “Windows Sysinternals Administrator's
13CSAK      ADVANCED COMPUTER ARCHITECTURE      L T P C
            3 0 0 3

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Identify the limitations of ILP and need for Dynamic Scheduling.
CO 2: Discuss the Hardware support issues related to multiprocessing and suggest solutions.
CO 3: Analyze the symmetric and distributed memory architecture and thread level applications.
CO 4: To study the Memory and I/O systems and their performance issues.
CO 5: Point out the salient features of different multi core architectures and how they exploit parallelism.

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

UNIT II    HARDWARE SUPPORT
VLIW and EPIC - Advanced compiler support - Hardware support for exposing parallelism - Hardware versus software speculation mechanisms - IA64 and Pentium processors - Limits on ILP.

UNIT III   MULTIPROCESSORS AND THREAD LEVEL PARALLELISM
Symmetric and distributed shared memory architectures - Performance issues - Synchronization - Models of memory consistency - Snooping Protocol-Introduction to Multithreading and its various applications – Hyper threading.

UNIT IV    MEMORY AND I/O
Cache performance - Reducing cache miss penalty and miss rate - Cache optimization techniques - Reducing hit time - Main memory and performance - Memory technology. Types of storage devices - Buses - I/O performance measures - Designing an I/O system.

UNIT V     MULTI-CORE ARCHITECTURES
Software and hardware multithreading - SMT and CMP architectures - Design issues - Case studies - Intel Multi-core architecture - SUN architecture - heterogeneous multi - core processors - case study: IBM Cell Processor.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCE
13CSAL COMPUTER ORIENTED OPTIMIZATION TECHNIQUES L T P C
3 0 0 3

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
CO 1: Comprehend the basics of optimization principles.
CO 2: Recognize the importance of optimization algorithms.
CO 3: Apply the methods with mathematical influence in optimization problems.
CO 4: Analyze the computational models for implementing optimization techniques.
CO 5: Formulate optimal solutions for real-world problems.

UNIT I OVERVIEW OF OPTIMIZATION

UNIT II OPTIMIZATION ALGORITHMS

UNIT III OPTIMIZATION TECHNIQUES

UNIT IV COMPUTATIONAL MODELS
Evolutionary Computation - Genetic Algorithms – Ant Colony Optimization – Swarm Optimization - Particle Swarm dynamic Optimization.

UNIT V APPLICATION DESIGN WITH OPTIMIZATION
Model for Classification and Rule Generation - Data Preprocessing - Parameter Determination by Metaheuristics - Rule Extraction - Empirical Results.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
13CSAM DATA MINING L T P C
3 0 0 3

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
CO 1: Identify the issues in data mining applications
CO 2: Apply preprocessing methods for given raw data
CO 3: Apply classification algorithms
CO 4: Identify the clustering technique and analyze the data
CO 5: Use association rule mining to generate rules

UNIT I DATA MINING
Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues.

UNIT II DATA PREPROCESSING

UNIT III CLASSIFICATION

UNIT IV CLUSTER ANALYSIS

UNIT V ASSOCIATION RULE MINING

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
13CSAN     CYBER FORENSICS AND ETHICAL HACKING     L  T  P  C
                        3  0  0  3

COURSE OUTCOMES
Upon Successful completion of this course, the students will be able to
CO 1: Understand the principles of Computer Forensics and Cyber Forensics
CO 2: Analyze the forensics activities in digital devices
CO 3: Explore Organizational implications on cyber security
CO 4: Learn and Summarize about various Ethical Hackers.
CO 5: Understand about various types of hacking

UNIT I  UNDERSTANDING CYBER FORENSICS  9

UNIT II  FORENSICS OF HAND-HELD DEVICES  9

UNIT III  CYBERSECURITY: ORGANIZATIONAL IMPLICATIONS  9

UNIT IV  INTRODUCTION TO ETHICAL HACKING  9
Introduction to Hacking – Penetration Testing-Legal and Ethical Considerations – Creating and Implementing a Test Plan – Social Engineering –Google Hacking – Foot printing.

UNIT V  ETHICAL HACKING TYPES  9

L:45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
13CSAP        SIMULATION THEORY AND PRACTICES        L T P C
                     3 0 0 3

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
 CO 1: Explore the methods for modeling of systems using event simulation.
 CO 2: Emphasis on modeling and on the use of simulation software.
 CO 3: Apply the image processing techniques
 CO 4: Apply the LAN switches
 CO 5: Simulate the Networks routing and analysis algorithms

UNIT I       INTRODUCTION TO SIMULATION
Introduction - Simulation terminologies - Application areas - Model classification - Types of
Simulation - Steps in a simulation study - Concepts in discrete event simulation - Simulation
eamples.

UNIT II      MATHEMATICAL MODELS
Statistical Models: Concepts - Discrete distribution - Continuous distribution - Poisson process -
Empirical distributions. Queuing models: Characteristics – Notation - Queuing systems - Markovian

UNIT III   LOCAL AREA NETWORK SIMULATION
Operation and necessity of using private and public IP addresses for IPv4 addressing - IPv6
addressing scheme to satisfy addressing requirements in a LAN/WAN environment - IPv4
addressing scheme using VLSM and summarization to satisfy addressing requirements in a
LAN/WAN environment - Technological requirements for running IPv6 in conjunction with IPv4
such as dual stack - IPv6 addresses

UNIT IV     DIGITAL IMAGE PROCESSING SIMULATOR
Images: Additive and Subtractive Primary Colours - Line dropout and Salt and Pepper noise removal
- Image Differencing (subtraction) – Linear Edge Enhancement - Supervised Classification

UNIT V       NETWORK SIMULATOR
NS3 – Introduction - Modeling the Network Elements -Simulating a Computer Network - Smart
Pointers -Representing Packets - Object Aggregation - Events - Compiling and Running the
Simulation-Animating the Simulation - Analyzing the Results.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS
(Eds.) 2010.
5. www.iifm.ac.in/downloads/dips/

REFERENCES
3. Online Book, Jerry Banks, “Handbook of Simulation: Principles, Methodology, Advances,
13CSAR SOFTWARE QUALITY MANAGEMENT

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

CO 1: To study the concept of Software quality models.
CO 2: To learn about Quality plan, implementation and documentation.
CO 3: To analyze the need for Quality tools and CASE tools.
CO 4: To introduce few International quality standards – ISO, CMM, Six Sigma.

UNIT I INTRODUCTION TO SOFTWARE QUALITY

UNIT II SOFTWARE QUALITY ASSURANCE

UNIT III QUALITY CONTROL AND RELIABILITY

UNIT IV QUALITY MANAGEMENT SYSTEM

UNIT V QUALITY STANDARDS

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
## 13CSAS M-COMMERCE
(Common to CSE and IT)  
L T P C  
3 0 0 3

### COURSE OUTCOMES

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

- **CO 1:** Comprehend the underlying economic mechanisms and driving forces of E-Commerce
- **CO 2:** Understand the critical building blocks and network infrastructure of E-Commerce
- **CO 3:** Realize the infrastructure and types of M-Commerce Services
- **CO 4:** Recognize the availability of latest technologies of M-commerce in various domains.
- **CO 5:** Show Competency in business application services of M-Commerce.

### UNIT I  E-COMMERCE

### UNIT II  NETWORK INFRASTRUCTURE

### UNIT III  M-COMMERCE: BASICS
Introduction, Infrastructure of M–Commerce, Types of Mobile Commerce Services, Technologies of Wireless Business, Benefits and Limitations, Support, Mobile Marketing & Advertisement, Non–Internet Applications in M–Commerce, Wireless/Wired Commerce Comparisons

### UNIT IV  TECHNOLOGIES

### UNIT V  BUSINESS APPLICATIONS AND SERVICES
Mobile Information Services, Directory Services, Banking and Trading, E-Tailing and E-Ticketing, Entertainment, Business Applications and Services, Next Generation M-commerce Scenarios, Personalization, Location-Based Services.

**L: 45 TOTAL: 45 PERIODS**

### TEXT BOOKS

### REFERENCES
13CSAT         NATURE AND BIO INSPIRED COMPUTING     L T P C
                          3 0 0 3

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
   CO 2: Understand the computational complexity of search heuristics using biologically inspired
          computing.
   CO 3: Uncover the state-of-the-art of present technology.
   CO 4: Survey relevant theoretical models, reconfigurable architectures and computational
          Intelligence techniques.

UNIT I       INTRODUCTION                                                                                                     9
Natural to Artificial Systems– Behavior of Social Insects: Foraging – Division of Labor — Cemetery
Organization and Brood Sorting – Nest Building.

UNIT II      ANT COLONY OPTIMIZATION                                                                                              9
Ant Behavior – Towards Artificial Ants– Ant Colony Optimization– Combinatorial Optimization-
Meta-heuristic-Local Search-Tabu Search-Global Search.

UNIT III     APPLICATIONS                                                                                                        9
Ant Colony Optimization algorithms for NP-hard problems: Routing problems–Assignment problem-
Scheduling problem – Subset problem–Machine Learning Problem – ACO for Traveling Salesman

UNIT IV      SWARM INTELLIGENCE                                                                                                   9
Biological foundations of Swarm Intelligence – Swarm Intelligence in Optimization – Particle
Swarms for dynamic optimization problems.

UNIT V       COMPUTING PARADIGMS                                                                                                  9
Biological Inspired computing to Natural Computing – Integration of Evolutionary Computation
Components in Ant Colony Optimization – Particle Swarm Optimization based on Socio-cognition.

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS
2. Eric Bonabeau, Marco Dorigo, Guy Theraulaz, “Swarm Intelligence: From Natural to
3. Leandro N.De Castro, Fernando J.Von Zuben, “Recent Developments in Biologically

REFERENCE
COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
CO 1: Impart the trends in emerging field of wireless adhoc and sensor networking.
CO 2: Focus on layered communication modeling, such as the media access control and network layer.
CO 3: Address quality of service issues and network reliability for transmission of real-time information.
CO 4: Learn the various routing protocols of adhoc and sensor networks.

UNIT I  ADHOC NETWORKS INTRODUCTION  9

UNIT II  ADHOC NETWORK ROUTING PROTOCOLS  9

UNIT III  QoS AND ENERGY MANAGEMENT  9

UNIT IV  WSN INTRODUCTION  9

UNIT V  WSN PROTOCOLS  9

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
MEDICAL IMAGING

COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
CO 1: Acquire the knowledge of different methods and modalities used for medical imaging.
CO 2: Demonstrate imaging methods using advanced modalities.
CO 3: Synthesize knowledge and skills essential to the successful practice of diagnostic medical imaging.
CO 4: Understand the ionizing radiation related risks and radiation protection principles in medical imaging and utilize the problem solving process effectively.
CO 5: Implement methods to analyze medical images as part of a term project.

UNIT I  BASIC CONCEPTS

UNIT II  DIAGNOSTIC RADIOLOGY

UNIT III  MAGNETIC RESONANCE IMAGING (MRI) & NUCLEAR IMAGING
MRI: Advanced Image Acquisition Methods, Artifacts-Spectroscopy- Quality Control- Siting-Bioeffects and Safety. Nuclear Imaging: Positron Emission Tomography and Dual Modality Imaging-SPECT/CT, PET/CT.

UNIT IV  MEDICAL IMAGE ANALYSIS AND VISUALIZATION

UNIT V  RADIATION BIOLOGY AND PROTECTION

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
### 13CSBA SOCIAL COMPUTING
(Common to IT, ECE and CSE)  3 0 0 3

**COURSE OUTCOMES**
Upon successful completion of this course, the students will be able to
- CO 1: Describe the key concepts of analysis and design of social computing systems.
- CO 2: Discuss the range of social computing applications.
- CO 3: Apply the knowledge of social interaction technologies like blogs, wikis, podcasts, etc.,
- CO 4: Show Proficiency in the general social network research process from data collection to mining.

**UNIT I FUNDAMENTAL CONCEPTS AND THEORIES**  9

**UNIT II DESIGN METHODOLOGIES**  9

**UNIT III DEVELOPMENT**  9

**UNIT IV TOOLS AND TECHNOLOGIES**  9

**UNIT V SOCIAL COMPUTING AND COMMUNITY DETECTION**  9
Basic Concepts - social computing task. Nodes, ties and Influence- Importance of Nodes - Strengths of Ties - Influence Modeling. Node-Centric Community Detection - Group-Centric Community Detection. Social Media Mining-Classification with Network Data.

L: 45  TOTAL: 45 PERIODS

**TEXT BOOKS**

**REFERENCES**
13CSBB ANALYTIC COMPUTING (Common to IT, ECE and CSE) L T P C 3 0 0 3

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

CO 1: Apply statistical analysis methods in Big Data Platform.
CO 2: An ability to analyze a problems appropriate to mining data streams.
CO 3: Apply the knowledge of clustering techniques in data mining.
CO 4: Explain about social networking data analytics.
CO 5: Use Visualization techniques for Distributed file systems

UNIT I INTRODUCTION TO BIG DATA 9

UNIT II MINING DATA STREAMS 9

UNIT III FREQUENT ITEMSETS AND CLUSTERING 9

UNIT IV SOCIAL NETWORKING DATA ANALYTICS 9

UNIT V FRAMEWORKS AND VISUALIZATION 9
MapReduce – Hadoop, Hive, MapR – Sharding – NoSQL Databases - S3 - Hadoop Distributed file systems – Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications:

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
COURSE OUTCOMES
Upon successful completion of this course, the students will be able to
CO 1: Explain the fundamentals of cloud computing
CO 2: Distinguish the various cloud services
CO 3: Explore some important cloud computing driven commercial systems such as GoogleApps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.

UNIT I UNDERSTANDING CLOUD COMPUTING

UNIT II DEVELOPING CLOUD SERVICES

UNIT III CLOUD COMPUTING FOR EVERYONE
Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

UNIT IV USING CLOUD SERVICES

UNIT V OTHER WAYS TO COLLABORATE ONLINE

L: 45 TOTAL: 45 PERIODS

TEXT BOOK

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

CO 1: Develop an in-depth understanding, in terms of architecture, protocols and applications, of major high-speed networking technologies.

CO 2: Apply queuing analysis to control the effect of the congestion in high speed networks.

CO 3: Compare the various approaches of the Integrated and Differentiated Services.

CO 4: Discuss the protocols which provide QoS support for Real Time Applications.

UNIT I HIGH SPEED NETWORKS

UNIT II QUEUING ANALYSIS AND CONGESTION CONTROL

UNIT III ATM CONGESTION CONTROL

UNIT IV INTEGRATED AND DIFFERENTIATED SERVICES

UNIT V PROTOCOLS FOR QOS SUPPORT

L: 45 TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCES
13CSBE SERVICE ORIENTED ARCHITECTURE (Common to IT and CSE) L T P C
3 0 0 3

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

CO 1: Explain about principles of Service Orientatation
CO 2: Describe about service oriented analysis techniques
CO 3: Describe the Service Oriented Design concepts
CO 4: Explain the parts of the development and runtime ends of a distributed technology platform for SOA.
CO 5: Describe about various Web service specification standards

UNIT I PRINCIPLES OF SERVICE ORIENTATION 9

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

UNIT III SERVICE ORIENTED DESIGN 9

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

UNIT V WEB SERVICE SPECIFICATION STANDARDS 9

L: 45 TOTAL: 45 PERIODS

TEXT BOOK

REFERENCES