REGULATIONS – 2011

DEPARTMENT OF

COMPUTER SCIENCE AND ENGINEERING

CURRICULUM AND SYLLABI OF

B.E.- COMPUTER SCIENCE AND ENGINEERING
REGULATIONS 2011

CURRICULUM AND SYLLABI FOR FULL TIME

B.E. COMPUTER SCIENCE AND ENGINEERING

SEMESTER – I

Common to all B.E. / B.Tech. Degree Programmes)

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**THEORY**

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* Common to all B.E. / B.Tech. Programmes
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### Elective I

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UNIT I

Suggested activities:
2. Changing sentences from active to passive voice & vice versa.
3. Skimming, cloze exercises, exercises transferring information from text to graphic form – bar charts, flow charts.
4. Writing descriptions using descriptive words & phrases, and technical vocabulary.
5. Role play, conversation exercises, discussions, oral reporting exercises.
   Any other related relevant classroom activity.

UNIT II

Suggested Activities:
1. a. Vocabulary activities using prefixes and suffixes.
   b. Exercises using questions – asking & answering questions.
2. Scanning the text for specific information.
4. Discussion activities and exploring creative ideas.
   Any other related relevant classroom activity.

UNIT III

Suggested activities:
1. Providing appropriate context for the use of tenses
2. Listening and note-taking
3. (a) Writing sentence definitions and instructions
   (b) Identifying the discourse links and sequencing jumbled sentences.
4. Speaking exercises, discussions, role play exercises using explaining, convincing and persuasive Strategies.
   Any other related relevant classroom activity.

UNIT IV
Modal verbs and Probability – Concord subject verb agreement (Correction of errors) – Cause and effect expressions – Extended Definition – Speaking about the future plans.
Suggested activities:
1. a. Making sentences using modal verbs to express probability
   b. Gap filling using relevant grammatical form of words.
2. Writing extended definitions
3. Speaking – role play activities, discussions, extempore speaking exercises speculating about the future.
   Any other related relevant classroom activity

UNIT V

Suggested activities:
1. a) Sentence completion exercises using ‘If’ conditionals.
   b) Gap filling exercises using gerunds and present participle forms
2. Reading comprehension exercises.
3. Role play, discussion, debating and speaking activities for stating, discussing problems and suggesting solutions.
4. Writing letters to officials and to the editor in formal/official contexts.
   Any other related relevant classroom activity.

TOTAL: 60 PERIODS

AREAS TO BE COVERED UNDER DIFFERENT HEADINGS:

A) Language focus
1. Suffixes and Prefixes
2. Transformation of words from one form to another (Derivatives from root words)
3. Matching words & meanings (synonyms)
4. Compound nouns
5. Degrees of comparison
6. Active and passive voice-impersonal passive
7. Tenses: simple present, simple past, simple future, present continuous, past continuous, Present Perfect.
8. Modal verbs
9. ‘Wh’ Question forms
10. Conditional clause
11. Gerunds and infinitives
12. Expressing Cause and effect
13. Concord
14. Punctuation
15. Writing definitions

B) Reading
1. Reading in context
2. Skimming and scanning
3. Scanning the text for specific information
4. Reading and note-making
5. Intensive reading for making inferences
6. Reading comprehension
C) Listening:

1. Listening and transfer of information
2. Listening & note taking

D) Writing:

1. Transformation of information from graphical data to written form and from written form to graphical Form.
2. Paragraph writing – Description
3. Paragraph Writing – comparison and contrast.
4. Note-making
5. Writing Instructions
6. Jumbled sentences
7. Letter writing – Formal letters (Invitation, Accepting, Declining, Permission Letters) Letters to the editor

E) Speaking:

1. Discussing as a group and making oral reports,
2. Role play- Conversation techniques – convincing others
3. Creative thinking and speaking, Exploring creative ideas
4. Persuasive strategies
5. Speaking about the future plans
6. Extempore speech – Speaking exercises speculating about the future
7. Presentation of problems and solutions
8. Debates

TEXT BOOK:


REFERENCES:


Extensive Reading:
UNIT I MATRICES  

UNIT II THREE DIMENSIONAL ANALYTICAL GEOMETRY  

UNIT III DIFFERENTIAL CALCULUS  
Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes – Evolute as envelope of normals.

UNIT IV FUNCTIONS OF SEVERAL VARIABLES  

UNIT V MULTIPLE INTEGRALS  
Double integration – Cartesian and polar coordinates – Change of order of integration – Change of variables between Cartesian and polar coordinates – Triple integration in Cartesian co-ordinates – Area as double integral – Volume as triple integral.

TOTAL: 60 PERIODS

TEXT BOOK:

REFERENCES:
BPH101  ENGINEERING PHYSICS – I  L T P C  3 0 0 3

UNIT I  ULTRASONICS  9

UNIT II  LASERS  9

UNIT III  FIBER OPTICS & APPLICATIONS  9

UNIT IV  QUANTUM PHYSICS  9

UNIT V  CRYSTAL PHYSICS  9
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 – Packing factor for SC, BCC, FCC and HCP structures – NaCl, ZnS, diamond and graphite structures – Polymorphism and allotropy – Crystal defects – point, line and surface defects – Burger vector.

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES:
BCY101 ENGINEERING CHEMISTRY – I L T P C
3 0 0 3

UNIT I WATER TECHNOLOGY
9

UNIT II POLYMERS AND COMPOSITES
9

UNIT III SURFACE CHEMISTRY
9

UNIT IV NON-CONVENTIONAL ENERGY SOURCES AND STORAGE DEVICES
9

UNIT V ENGINEERING MATERIALS
9

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
BCS101  FUNDAMENTALS OF COMPUTING AND PROGRAMMING  L T P C
                                                3 0 0 3

UNIT I  INTRODUCTION TO COMPUTERS  9
Classification of Computers – Basic Computer Organization – Number Systems.

UNIT II  COMPUTER SOFTWARE  9
Computer Software – Types of Software – Software Development Steps – Internet Evolution – Basic
Internet Terminology – Getting connected to Internet – Applications.

UNIT III  PROBLEM SOLVING AND OFFICE AUTOMATION  9
Planning the Computer Program – Purpose – Algorithm – Flow Charts – Pseudocode – Application
Software Packages – Introduction to Office Packages (not detailed commands for examination).

UNIT IV  INTRODUCTION TO “C”  9
Overview of “C” – Constants, Variables and Data Types – Operators and Expressions – Managing
Input and Output operators – Decision Making – Branching and Looping.

UNIT V  FUNCTIONS AND POINTERS  9
Handling of Character Strings – User-defined functions – Definitions – Declarations – Call by
reference – Call by value – Structures and Unions – Pointers – Arrays – The Preprocessor –
Developing a “C” Program: Some Guidelines.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
   Education Inc. (2005).
BME101 ENGINEERING GRAPHICS L T P C
2 3 0 4

UNIT I PLANE CURVES AND FREE HAND SKETCHING 12
CURVES USED IN ENGINEERING PRACTICES:
Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of
cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the
above curves.
FREE HAND SKETCHING:
Representation of Three Dimensional objects – General principles of orthographic projection – Need
for importance of multiple views and their placement – First angle projection – layout views –
Developing visualization skills through free hand sketching of multiple views from pictorial views of
objects.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES 12
Projection of points and straight lines located in the first quadrant – Determination of true lengths and
true inclinations – Projection of polygonal surface and circular lamina inclined to both reference
planes.

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

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

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS 12
Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated
prisms, pyramids, cylinders and cones, Combination of any two simple solids. Perspective projection
of prisms, pyramids and cylinders by visual ray method and vanishing point method.

TOTAL: 60 PERIODS

TEXT BOOK:

REFERENCES:
6. Dhananjay A. Jolhe, “Engineering Drawing with an introduction to AutoCAD” Tata

**BCS131** COMPUTER PRACTICE LABORATORY – I  L T P C
0 0 3 2

**LIST OF EXERCISES**

I. **MS Office**

a) **WORD PROCESSING**
   1. Document creation, Text manipulation with Scientific notations.
   2. Table creation, Table formatting and Conversion.

b) **SPREAD SHEET**
   1. Chart - Line, XY, Bar and Pie.
   2. Formula - formula editor.
   4. Sorting and Import / Export features.

II **SIMPLE C PROGRAMMING**

1. Data types, Expression evaluation, Conditional statements.
2. Arrays.
4. Functions.

**TOTAL: 45 PERIODS**

For programming exercises Flow chart and pseudocode are essential.

**HARDWARE / SOFTWARE REQUIRED FOR A BATCH OF 60 STUDENTS**

**HARDWARE**

- LAN System with 66 nodes (OR) Standalone PCs – 66 Nos.
- Printers – 3 Nos.

**SOFTWARE**

- OS – Windows / UNIX Clone
- Application Package – Office suite
- Compiler – “C”
BPC131    PHYSICS AND CHEMISTRY LABORATORY – I    L T P C
0032

PHYSICS LABORATORY – I

LIST OF EXPERIMENTS

1. (a) Particle size determination using Diode Laser.
   (b) Determination of Laser parameters – Wavelength and angle of divergence.
   (c) Determination of acceptance angle in an optical fiber.
2. Determination of thickness of a thin wire – Air wedge method.
6. Determination of Hysteresis loss in a ferromagnetic material.

B. CHEMISTRY LABORATORY – I

LIST OF EXPERIMENTS

1. Estimation of hardness of Water by EDTA method.
2. Estimation of Copper in brass by EDTA method.
3. Determination of DO in water (Winkler’s method)
4. Estimation of Chloride in Water sample (Argentometric)
5. Estimation of alkalinity of Water sample
6. Determination of molecular weight and degree of polymerization using viscometry.
BME131  ENGINEERING PRACTICES LABORATORY     L  T  P  C
GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE
BUILDINGS:
(a) Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

PLUMBING WORKS:
(a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
(a) Study of pipe connections requirements for pumps and turbines.
(c) Preparation of plumbing line sketches for water supply and sewage works.
(d) Hands-on-exercise:
   Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.
(e) Demonstration of plumbing requirements of high-rise buildings.

CARPENTRY USING POWER TOOLS ONLY:
(a) Study of the joints in roofs, doors, windows and furniture.
(b) Hands-on-exercise:
   Wood work, joints by sawing, planing and cutting.

II MECHANICAL ENGINEERING PRACTICE
WELDING:
(a) Preparation of arc welding of butt joints, lap joints and tee joints.
(b) Gas welding practice.

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

SHEET METAL WORK:
(a) Forming & Bending:
(b) Model making – Trays, funnels, etc.
(c) Different type of joints.

MACHINE ASSEMBLY PRACTICE:
(a) Study of centrifugal pump.
(b) Study of air conditioner.

DEMONSTRATION ON:
(a) Smithy operations, upsetting, swaging, setting down and bending. Example – Exercise – Production of hexagonal headed bolt.
(b) Foundry operations like mould preparation for gear and step cone pulley.
(c) Fitting – Exercises – Preparation of square fitting and vee – fitting models.
GROUP B (ELECTRICAL & ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE
1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair-case wiring
5. Measurement of energy using single phase energy meter.

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

REFERENCES:

TOTAL: 45 PERIODS
BEG201 TECHNICAL ENGLISH – II (Common to all branches)  

**AIM**

To encourage students to actively involve in participative learning of English and to help them acquire communication skills.

**OBJECTIVES**

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

**UNIT I**  
Technical Vocabulary – meanings in context, sequencing words, Articles – Prepositions, intensive reading and predicting content, Reading and interpretation, extended definitions, process description.

**Suggested activities**

1. Exercises on word formation using the prefix ‘self’ – Gap filling with preposition  
   Exercises – Using sequence words
2. Reading comprehension exercise with questions based on inference – Reading heading and predicting the content – reading advertisements and interpretation
3. Writing extended definitions – Writing description of processes – Writing paragraphs based on discussions – Writing paragraphs describing the future

**UNIT II**  

**Suggested Activities**

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

**UNIT III**  

**Suggested Activities**

1. Exercises combining sentences using cause and effect expressions – Gap filling exercises using the appropriate tense forms – Making sentences using different
grammatical forms of the same word.
2. Speaking exercises involving the use of stress and intonation – Group discussions – analysis of problems and offering solutions.
3. Reading comprehension exercises with critical questions, multiple choice questions.

UNIT IV

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

UNIT V
Speaking – Discussion of problems and solutions – Creative and critical thinking – writing an essay, Writing a proposal.

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

TOTAL 45 periods

AREAS TO BE COVERED UNDER DIFFERENT HEADINGS

A. Language Focus
1. Technical vocabulary
2. Sequencing words
3. Articles
4. Prepositions
5. Word formation using prefixes
6. Phrases / Structure indicating purpose
7. Adverbs
8. Cause and effect expressions
9. Tense forms
10. Different grammatical forms of the same word
11. Numerical adjectives
12. Extended definitions

B. Reading
1. Intensive reading and predicting content
2. Reading and interpretation  
3. Skimming  
4. Critical reading  
5. Reading comprehension exercises  

C. Listening  
1. Correlating verbal and non-verbal communication  
2. Listening comprehension  

D. Speaking  
1. Group Discussions  
2. Stress and intonation  
3. Role plays and giving oral instructions  
4. Discussion of problems and solutions  

E. Writing  
1. Process description  
2. Formal letter writing  
3. Writing analytical paragraphs  
4. Report Writing  
5. Descriptive writing  
6. Argumentative paragraphs  
7. Letter of application  
8. Instructions  
9. Recommendations  
10. Checklists preparation  
11. Email Communication  
12. Writing critical essays  
13. Writing proposals  

TEXT BOOK:  

REFERENCES:  

Extensive Reading:  

Note: The book listed under Extensive Reading is meant for inculcating the reading habit of the students. They need not be used for testing purposes.
BMA201 MATHEMATICS – II (Common to all branches) 3 1 0 4

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

UNIT II VECTOR CALCULUS 12
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 parallepipeds.

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

UNIT IV COMPLEX INTEGRATION 12

UNIT V LAPLACE TRANSFORM 12

TOTAL: 60 PERIODS

TEXT BOOKS:

REFERENCES:
BPH201  ENGINEERING PHYSICS – II  
(Common to all branches)  
L  T  P  C  
3  0  0  3

UNIT I  CONDUCTING MATERIALS  

UNIT II  SEMICONDUCTING MATERIALS  

UNIT III  MAGNETIC AND SUPERCONDUCTING MATERIALS  

UNIT IV  DIELECTRIC MATERIALS  

UNIT V  MODERN ENGINEERING MATERIALS  

TOTAL: 45 PERIODS

TEXT BOOKS:
2. Charles P. Poole and Frank J.Ownen, 'Introduction to Nanotechnology’, Wiley India (2007) (for Unit V)
REFERENCES:
AIM
To impart a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

OBJECTIVES
1. The student should be conversant with the principles of electrochemistry, electrochemical cells, emf and applications of emf measurements.
2. Principles of corrosion control.
3. Chemistry of Fuels and combustion.
4. Industrial importance of Phase rule and alloys.
5. Analytical techniques and their importance.

UNIT I  ELECTROCHEMISTRY

UNIT II  CORROSION AND CORROSION CONTROL

UNIT III  FUELS AND COMBUSTION

UNIT IV  PHASE RULE AND ALLOYS

UNIT V  ANALYTICAL TECHNIQUES

TOTAL: 45 PERIODS
TEXT BOOKS:

REFERENCES:
Objective

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

Unit I Basics & Statics of Particles


Unit II Equilibrium of Rigid Bodies


Unit III Properties of Surfaces and Solids


Unit IV Dynamics of Particles


Unit V Friction and Elements of Rigid Body Dynamics


Total: 60 Periods

Text Book:


References:
(b) BEE201 CIRCUIT THEORY (For EEE & EIE Branches)  

UNIT I  BASIC CIRCUITS ANALYSIS  

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

UNIT III  RESONANCE AND COUPLED CIRCUITS  

UNIT IV  TRANSIENT RESPONSE FOR DC CIRCUITS  
Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. input (Sinusoidal).

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

TOTAL: 60 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I  CIRCUIT ANALYSIS TECHNIQUES  12

UNIT II  TRANSIENT & RESONANCE IN RLC CIRCUITS  12

UNIT III  SEMICONDUCTOR DIODES  12

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

UNIT V  SPECIAL SEMICONDUCTOR DEVICES (Qualitative Treatment only)  12
Tunnel diodes, PIN diode, varactor diode – SCR characteristics and two transistor equivalent model – UJT – Diac and Triac – Laser, CCD, Photodiode, Phototransistor, Photoconductive and Photovoltaic cells – LED, LCD.

TOTAL: 60 PERIODS

TEXT BOOKS:

REFERENCES:
### (a) BEE202 BASIC ELECTRICAL & ELECTRONICS ENGINEERING

| (For Mechanical & Civil Branches) | 4 | 0 | 0 | 4 |

#### UNIT I ELECTRICAL CIRCUITS & MEASUREMENTS

#### UNIT II ELECTRICAL MACHINES

#### UNIT III SEMICONDUCTOR DEVICES AND APPLICATIONS

#### UNIT IV DIGITAL ELECTRONICS

#### UNIT V FUNDAMENTALS OF COMMUNICATION ENGINEERING

**TOTAL: 60 PERIODS**

**TEXT BOOKS:**

**REFERENCES:**
A – CIVIL ENGINEERING

UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS 15

UNIT II BUILDING COMPONENTS AND STRUCTURES 15

TOTAL: 30 PERIODS

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: 30 PERIODS

REFERENCES:
BCS231 COMPUTER PRACTICE LABORATORY – II
(Common to all branches) L T P C
0 1 2 2

LIST OF EXPERIMENTS

1. UNIX COMMANDS

Study of Unix OS – Basic Shell Commands – Vi Editor.

2. SHELL PROGRAMMING


3. C PROGRAMMING ON UNIX

Dynamic Storage Allocation – Pointers – Functions – File Handling.

TOTAL: 45 PERIODS

HARDWARE / SOFTWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS

Hardware

- UNIX Clone Server – 1 No
- Nodes (thin client or PCs) – 33 Nos
- Printer – 3 Nos.

Software

- OS – UNIX Clone (33 user license or License free Linux)
- Compiler - C
BPC231  PHYSICS AND CHEMISTRY LABORATORY – II  L T P C
(Common to all branches)  0 0 3 2

PHYSICS LABORATORY – II

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

• A minimum of FIVE experiments shall be offered.
• Laboratory classes on alternate weeks for Physics and Chemistry.

CHEMISTRY LABORATORY – II

LIST OF EXPERIMENTS
1. Conductometric titration (Simple acid base)
2. Conductometric titration (Mixture of weak and strong acids)
3. Conductometric titration using BaCl₂ Vs Na₂SO₄
4. Potentiometric Titration (Fe²⁺ Vs K₂Cr₂O₇)
5. pH Titration (Acid & Base)
6. Determination of water of crystallization of a crystalline salt (CuSO₄)
7. Estimation of Ferric ion by spectrophotometry.

• A minimum of FIVE experiments shall be offered.
• Laboratory classes on alternate weeks for Physics and Chemistry.
List of Exercises using software capable of Drafting and Modeling

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

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

List of Equipments for a batch of 30 students:

1. Pentium IV computer or better hardware, with suitable graphics facility – 30 Nos.
2. Licensed software for Drafting and Modeling – 30 Licenses
3. Laser Printer or Plotter to print / plot drawings – 2 Nos.
(b) BEE231 ELECTRICAL CIRCUITS LABORATORY
(For EEE & EIE branches)
L T P C
0 0 3 2

LIST OF EXPERIMENTS

- Verification of ohm’s laws and kirchoff’s laws.
- Verification of Thevenin’s and Norton’s Theorem
- Verification of superposition Theorem
- Verification of maximum power transfer theorem.
- Verification of reciprocity theorem
- Measurement of self inductance of a coil
- Verification of mesh and nodal analysis.
- Transient response of RL and RC circuits for DC input.
- Frequency response of series and parallel resonance circuits.
- Frequency response of single tuned circuits.

TOTAL: 45 PERIODS
(c) BEC231 CIRCUITS AND DEVICES LABORATORY
(For ECE, CSE & IT branches)

- Verification of KVL and KCL
- Verification of Thevenin and Norton Theorems.
- Verification of superposition Theorem.
- Verification of Maximum power transfer and reciprocity theorems.
- Frequency response of series and parallel resonance circuits.
- Characteristics of PN and Zener diode
- Characteristics of CE configuration
- Characteristics of CB configuration
- Characteristics of UJT and SCR
- Characteristics of JFET and MOSFET
- Characteristics of Diac and Triac.
- Characteristics of Photodiode and Phototransistor.

TOTAL: 45 PERIODS
BEG231  ENGLISH LANGUAGE SKILL LABORATORY (Skill of Listening)  L  T  P  C
(Common to all branches)  0  0  3  2

UNIT I (Micro Skills I)  4
Tasks (Type I): Lexical word identification
A. Identifying the homophones/words with silent letters/often mispronounced words
B. Identifying the missing words in native speech (Native accent)

Tasks (Type II): Decompressing structures
A. Expanding sound units into word clusters (Ex: verbs with multiple auxiliaries/contracted forms)
B. Identifying the constituent words in collocations/compound words/idiomatic phrases

UNIT II (Micro Skills II): Identifying tonal variations for meaning making  6
Tasks:
A. Punctuating the script after listening to it.
B. Marking word chunks/tone groups in transcript after listening to it.
C. Marking syllable stress in words.
D. Identifying tonal variations expressing rhetorical questions/ information seeking Questions / Exclamations / General statements.

UNIT III Content Comprehension and Making Inferences  12
Tasks:
A. Listening and filling in the chart
B. Multiple choice questions (Negative/factual)
C. True/False questions
D. Questions with multiple answers (choosing two/three correct answers)
E. Matching information
F. Filling the blanks (not more than three words)
G. Comprehending the text organization

UNIT IV Listening and act  8
Tasks:
A. Locating spots in a map following the given directions
B. Transferring data to graphs/diagrams/flow charts
C. Diagram/Picture completing tasks
D. Finding the answer through the process of elimination

TOTAL: 30 PERIODS
BMA301 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS  L T P C
(Common to all branches) 3 1 0 4

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

UNIT I FOURIER SERIES (9L+3T)

UNIT II FOURIER TRANSFORMS (9L+3T)

UNIT III PARTIAL DIFFERENTIAL EQUATIONS (9L+3T)
Formation of partial differential equations – Lagrange’s linear equation – Solutions of standard types of first order partial differential equations - Linear partial differential equations of second and higher order with constant coefficients.

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

UNIT V Z-TRANSFORMS AND DIFFERENCE EQUATIONS (9L+3T)

Lectures: 45  Tutorials: 15  Total: 60 Periods

TEXT BOOK

REFERENCES
BCE301  ENVIRONMENTAL SCIENCE AND ENGINEERING  L T P C
(Common to 3rd Sem – Civil, CSE, IT, EEE and EIE  
5th Sem – Mechanical, 7th Sem - ECE)  3 0 0 3

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

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

UNIT I  ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY  14
Definition, scope and importance of environment – need for public awareness – concept of an 
ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – 
energy flow in the ecosystem – ecological succession – food chains, food webs and ecological 
pyramids – Introduction, types, characteristic features, structure and function of the (a) forest 
ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, 
lakes, rivers, oceans, estuaries) –Introduction to biodiversity definition: genetic, species and 
écosystem diversity –biogeographical classification of India – value of biodiversity: consumptive use, 
productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local 
levels – India as a mega-diversity nation – hot-spots of biodiversity –threats to biodiversity: habitat 
loss, poaching of wildlife, man-wildlife conflicts –endangered and endemic species of India – 
conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common 
plants, insects, birds. Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II  ENVIRONMENTAL POLLUTION  8
Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil 
pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – solid 
waste management: causes, effects and control measures of municipal solid wastes – role of an 
individual in prevention of pollution – pollution case studies – disaster management: floods, 
earthquake, cyclone and landslides. Field study of local polluted site – Urban / Rural / Industrial / 
Agricultural.

UNIT III  NATURAL RESOURCES  10
Forest resources: Use and over-exploitation, deforestation, case studies – timber extraction, mining, 
dams and their effects on forests and tribal people – Water resources: Use and over – utilization of 
surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – 
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral 
resources, case studies – Food resources: World food problems, changes caused by agriculture and 
overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging, salinity, 
big studies – Energy resources: Growing energy needs, renewable and non renewable energy 
resources, use of alternate energy sources. Case studies – Land resources: Land as a resource, land 
degradation, man induced landslides, soil erosion and desertification – role of an individual in
conservation of natural resources – Equitable use of resources for sustainable lifestyles. Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV  SOCIAL ISSUES AND THE ENVIRONMENT  7

UNIT V  HUMAN POPULATION AND THE ENVIRONMENT  6

TOTAL: 45

TEXT BOOKS:

REFERENCES:
BCS301 DATA STRUCTURES

UNIT I LINEAR STRUCTURES

UNIT II TREE STRUCTURES

UNIT III BALANCED TREES

UNIT IV HASHING AND SET

UNIT V GRAPHS

TOTAL: 45

TEXT BOOK

REFERENCES
BS302         OBJECT ORIENTED PROGRAMMING                  L   T   P   C  
(3rd Sem – CSE & IT, 5th Sem – EIE, 6th Sem – EEE)  3   0   0   3  

UNIT I     BASICS OF OBJECT – ORIENTED PROGRAMMING 9  
Object oriented programming concepts – objects – classes – methods and messages – abstraction and 
encapsulation – inheritance – abstract classes – polymorphism. Introduction to C++ – classes – access 
specifiers – function and data members – default arguments – function overloading – friend functions 
– const and volatile functions – static members – Objects – pointers and objects – constant objects – 
nested classes – local classes.

UNIT II    CONSTRUCTORS AND FUNCTION OVERLOADING 9  
Constructors – default constructor – Parameterized constructors – Constructor with dynamic 
allocation – copy constructor – destructors – operator overloading – overloading through friend 
functions – overloading the assignment operator – type conversion – explicit constructor.

UNIT III   TEMPLATES AND EXCEPTION HANDLING 9  
Function and class templates – Exception handling – try-catch-throw paradigm – exception 
specification – terminate and unexpected functions – Uncaught exception.

UNIT IV    INHERITANCE 9  
Inheritance – public, private, and protected derivations – multiple inheritance – virtual base class – 
abstract class – composite objects runtime polymorphism – virtual functions – pure virtual functions – 

UNIT V     I/O STREAMS 9  
Streams and formatted I/O – I/O manipulators – file handling – random access – object serialization – 

TOTAL: 45

TEXT BOOK

REFERENCES
   2004.
   2005.
BEI303  DIGITAL PRINCIPLES AND SYSTEM DESIGN  (Common to CSE & IT)  
L T P C  
3 1 0 4  

UNIT I  BOOLEAN ALGEBRA AND LOGIC GATES  8+3  

UNIT II  COMBINATIONAL LOGIC  9+3  
Combinational circuits – Analysis and design procedures - Circuits for arithmetic operations - Code conversion – Introduction to Hardware Description Language (HDL).  

UNIT III  DESIGN WITH MSI DEVICES  8+3  
Decoders and encoders – Multiplexers and demultiplexers – Memory and programmable logic – HDL for combinational circuits.  

UNIT IV  SYNCHRONOUS SEQUENTIAL LOGIC  10+3  

UNIT V  ASYNCHRONOUS SEQUENTIAL LOGIC  10+3  
Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race-free state assignment – Hazards – ASM Chart.  

LECTURE: 45  TUTORIAL: 15  TOTAL: 60  

TEXT BOOK  

REFERENCES  
BEC304  ANALOG AND DIGITAL COMMUNICATION  L T P C  3 1 0 4

UNIT I  FUNDAMENTALS OF ANALOG COMMUNICATION  9+3

UNIT II  DIGITAL COMMUNICATION  9+3

UNIT III  DIGITAL TRANSMISSION  9+3

UNIT IV  DATA COMMUNICATIONS  9+3

UNIT V  SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES  9+3

LECTURE: 45      TUTORIAL: 15   TOTAL: 60

TEXT BOOKS

REFERENCES
BCS331  DATA STRUCTURES LABORATORY  L T P C
0 0 3 2

AIM:
To develop programming skills in design and implementation of data structures and their applications.

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 heaps.
9. Implement hashing with open addressing.
10. Implement Prim's algorithm using priority queues to find MST of an undirected graph.

TOTAL: 45

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

HARDWARE:
• 30 Personal Computers
• Processor – Pentium III or Pentium IV
• RAM – 256 MB or higher
• Hard disk – 40 GB or higher

SOFTWARE:
• Turbo C (freeware) – to be installed in all PC’s
• OS- Windows 2000/ Windows XP/ NT.
BCS332  OBJECT ORIENTED PROGRAMMING LABORATORY L T P C
(Common to 3rd Sem – CSE & IT, 5th Sem – EIE, 6th Sem – EEE) 0 0 3 2

OBJECTIVES
- To provide fundamental knowledge and skills to practice C++ programming.
- To develop ability to solve real-time problems using OOPs concepts.
- To have an understanding and hands-on practice in advanced concepts of C++

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 complex number class with necessary operator overloading and type conversions such as integer to complex, double to complex, complex to double etc.
3. Implement Matrix class with dynamic memory allocation and necessary methods. Give proper constructor, destructor, copy constructor, and overloading of assignment operator.
4. Overload the new and delete operators to provide custom dynamic allocation of memory.
5. Develop a template of linked-list class and its methods.
6. Develop templates of standard sorting algorithms such as bubble sort, insertion sort, merge sort, and quick sort.
7. Design stack and queue classes with necessary exception handling.
8. Define Point class and an Arc class. Define a Graph class which represents graph as a collection of Point objects and Arc objects. Write a method to find a minimum cost spanning tree in a graph.
9. Develop with suitable hierarchy, classes for Point, Shape, Rectangle, Square, Circle, Ellipse, Triangle, Polygon, etc. Design a simple test application to demonstrate dynamic polymorphism and RTTI.
10. Write a C++ program that randomly generates complex numbers (use previously designed Complex class) and writes them two per line in a file along with an operator (+, -, *, or /). The numbers are written to file in the format (a + ib). Write another program to read one line at a time from this file, perform the corresponding operation on the two complex numbers read, and write the result to another file (one per line).

TOTAL: 45

LIST OF EQUIPMENTS AND SOFTWARE FOR A BATCH OF 30 STUDENTS

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

SOFTWARE:
- Turbo C (freeware) – to be installed in all PC’s.
- OS - Windows 2000/ Windows XP/ NT
LIST OF EXPERIMENTS
1. Verification of Boolean theorems using digital logic gates
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices.
4. Design and implementation of parity generator / checker using basic gates and MSI Devices.
5. Design and implementation of magnitude comparator.
6. Design and implementation of application using multiplexers/ demultiplexers.
7. Design and implementation of Shift registers.
8. Design and implementation of Synchronous and Asynchronous counters.
9. Simulation of combinational circuits using Hardware Description Language (VHDL / Verilog HDL software required).
10. Simulation of sequential circuits using HDL (VHDL/ Verilog HDL software required)

TOTAL: 45
List of equipments and components for a batch of 30 students

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<th>Quantity Reqd</th>
<th>Remarks</th>
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<td>Dual power supply/ single mode power supply</td>
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<td>IC Trainer</td>
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<td>Bread Boards</td>
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<td>IC7474</td>
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<td>27</td>
<td>Computer with HDL software</td>
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<td>Seven segment display</td>
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<td>Assembled LED board/LEDs</td>
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<td>Wires Single strand</td>
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BEG331 COMMUNICATION SKILLS AND TECHNICAL SEMINAR – I  L T P C
(Common to all branches)  0 0 3 2
(To be conducted as a Practical Paper by the Depts of English for 3 hrs per week)

OBJECTIVES:

- To improve the learners’ oral fluency in English
- To help the learners acquire the readiness to speak in English
- To develop the sub-skills required for paper presentations and group discussions
- To help the learners improve their vocabulary related to specific fields of technology
- To facilitate the development of the learners’ proficiency in meaningful interaction
- To provide them linguistic support for managing vital sub-functions of Communication

COURSE CONTENT:

A) Phonetic practice (7 hrs)
- English phonemes with special emphasis on the diphthongs

B) Speech practice (8 hrs)
- Speaking on the themes by developing the hints provided.
  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. Climate change
  10. Ecological threats
  11. Water resources
  12. Nuclear technology
  13. Scientific farming
  14. Thermal power plants
  15. Natural calamities
  16. Robotics
  17. Artificial intelligence
  18. Role of Fibre Optics
  19. Exploration of Mars
  20. Gas turbines

C) Group Quiz on technical aspects related to the themes (4hrs)

D) Language Functions (8 hrs)

1. comparing and contrast
2. reporting the conversation of others.
3. talking about future plans and intentions
4. giving reasons
5. expressing preferences
6. quantifying
7. expressing certainty and uncertainty
8. expressing opinions and impressions
9. making suggestions
10. expressing assumptions
11. evaluating options
12. hypothesing/deducing
13. defending a point of view

E) Seminar presentation on the themes allotted (18 hrs)
PROCEDURE:

A) Phonetic practice
All the speech sounds should be taught. The learners should be given drills in the pronunciation of at least 30 words for each sound. While practicing stress patterns, they should be encouraged to identify as many words as possible for each suffix ending.

B) Speech practice
Every student should be allowed to choose one theme to specialize in. (However not more than 4 students in a section can choose the same theme). The teacher has to prepare at least 4 hints development tasks on each theme and should provide chance to each learner to speak on those hints related to his/her theme (5 minutes). The hints may be supplied to the students in advance. When a student speaks, the class should be encouraged to ask questions as well as note down the words related to the different fields.

C) Group Quiz on technical phrases related to the themes.
The class should be divided into groups that specialize on a particular theme. Each group should conduct a quiz (question & answer session) which will be answered by the other groups.

D) 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.

E) Seminar presentation on the themes allotted
Each student should collect materials from books, journals and newspapers for his/her theme and prepare a short seminar paper. The presentation should be for 10 minutes. It should be followed ‘open house’ during which others should come forward to question, clarify, supplement or evaluate.

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.
- Twenty words for each phoneme
- Twenty words with stress marks for each suffix ending
- Vocabulary list (technical words and compound words) related to the 20 themes identified for this semester.
- Three newspaper items, two journal items and three internet sources related to the special theme selected by the student. (To be pasted on the pages)
- The Quiz questions of the group with expected answers.
- The seminar paper presented by the learner with details about the open house.
- Notes of observation. (Details about any three seminar paper presentations by others)
- The record should be duly signed by the course teacher and submitted to the External Examiner for verification during the semester practicals.

P = 45 Total = 45
BCS401  DESIGN AND ANALYSIS OF ALGORITHMS  L  T  P  C
3  1  0  4

UNIT I  ALGORITHM ANALYSIS  9+3
Algorithm Analysis – Time Space Tradeoff – Asymptotic Notations – Conditional asymptotic
notation – Removing condition from the conditional asymptotic notation – Properties of big-Oh
notation – Recurrence equations – Solving recurrence equations – Analysis of linear search.

UNIT II  PROBLEM SOLVING TECHNIQUES  9+3
Divide and Conquer: General Method – Binary Search – Finding Maximum and Minimum – Merge

UNIT III  DYNAMIC PROGRAMMING  9+3
Dynamic Programming: General Method – Multistage Graphs – All-Pair shortest paths – Optimal
binary search trees – 0/1 Knapsack – Traveling salesperson problem.

UNIT IV  BACKTRACKING  9+3
Backtracking: General Method – 8 Queens problem – sum of subsets – graph coloring – Hamiltonian
problem – knapsack problem.

UNIT V  ANALYSIS OF GRAPH  9+3
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.

LECTURE: 45  TUTORIAL: 15  TOTAL: 60

TEXT BOOKS:
   Edition, Universities Press, 2007. (For Units II to V)
   Pvt. Ltd., 2000. (For Unit I)

REFERENCES:
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "The Design and Analysis of
BCS402  MICROPROCESSES AND MICROCONTROLLERS  L T P C
(Common to CSE & IT)  3 0 0 3

UNIT I  8085 MICROPROCESSORS  9
8085 Microprocessor architecture – Addressing modes – Instruction set – Programming the 8085.

UNIT II  8086 SOFTWARE ASPECTS  9
Intel 8086 microprocessor – Architecture – Signals – Instruction Set – Addressing Modes –
Assembler Directives – Assembly Language Programming – Procedures – Macros – Interrupts And
Interrupt Service Routines – BIOS function calls.

UNIT III  MULTIPROCESSOR CONFIGURATIONS  9
Coprocessor Configuration – Closely Coupled Configuration – Loosely Coupled Configuration –8087
Numeric Data Processor – Architecture – Data Types – 8089 I/O Processor – Architecture –
Communication between CPU and IOP.

UNIT IV  I/O INTERFACING  9
Memory interfacing and I/O interfacing with 8085 – parallel communication interface –serial
communication interface – timer-keyboard/display controller – interrupt controller –DMA controller
(8237) – applications – stepper motor – temperature control.

UNIT V  MICROCONTROLLERS  9
data I/O – interrupts-Interfacing -keyboard, LCD,ADC and DAC.

TOTAL: 45

TEXT BOOKS:
1. Ramesh S. Gaonkar , “Microprocessor – Architecture, Programming and Applications with
2. Yu-cheng Liu,Glenn A.Gibson, “Microcomputer systems: The 8086 / 8088 Family

REFERENCES:
2. A.K.Ray and K.M Bhurchandi, “Advanced Microprocessor and Peripherals – Architecture,
BMA402 PROBABILITY AND QUEUEING THEORY (Common to CSE & IT) L T P C
3 1 0 4

AIM

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

OBJECTIVES

At the end of the course, the students would

1. Have a fundamental knowledge of the basic probability concepts.
2. Have a well-founded knowledge of standard distributions which can describe real life phenomena.
3. Acquire skills in handling situations involving more than one random variable and functions of random variables.
4. Understand and characterize phenomena which evolve with respect to time in a probabilistic manner.
5. Be exposed to basic characteristic features of a queuing system and acquire skills in analyzing queuing models.

UNIT I RANDOM VARIABLES (9L+3T)
Discrete and continuous random variables - Moments - Moment generating functions and their properties. Binomial, Poisson, Geometric, Negative binomial, Uniform, Exponential, Gamma, and Weibull distributions.

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

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

UNIT IV QUEUEING THEORY (9L+3T)
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 (9L+3T)
M/G/1 queue- Pollaczek- Khintchine formula, series queues- open and closed networks.

Lectures: 45 Tutorials: 15 Total: 60 Periods

TEXT BOOKS

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

REFERENCES:

BCS403  COMPUTER ORGANIZATION AND ARCHITECTURE  L. T. P. C  3 1 0 4
(Common to CSE & IT)

UNIT I  BASIC STRUCTURE OF COMPUTERS  12

UNIT II  BASIC PROCESSING UNIT  12

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

UNIT IV  MEMORY SYSTEM  12

UNIT V  I/O ORGANIZATION  12

LECTURE: 45 TUTORIAL: 15 TOTAL: 60

TEXT BOOK:

REFERENCES:
BCS404 OPERATING SYSTEMS
(Common to 4th Sem – CSE & IT 6th Sem - ECE)

OBJECTIVES

• To aware about OS services that assist system users
• To expose several aspects of OS design including: process scheduling, synchronization, deadlocks and File systems.
• To become familiar with the kinds of abstractions provided by general purpose OS.
• To learn the internal policies and mechanisms implemented in the kernel part of operating systems.
• To analyze the tradeoffs inherent in operating system design and performances.

UNIT I PROCESSES AND THREADS
9

UNIT II PROCESS SCHEDULING AND SYNCHRONIZATION
10

UNIT III STORAGE MANAGEMENT
9

UNIT IV FILE SYSTEMS
9

UNIT V I/O SYSTEMS
8

TOTAL: 45

TEXT BOOK:

REFERENCES:
BCS405 DATABASE MANAGEMENT SYSTEMS
(Common to CSE & IT)

UNIT I INTRODUCTION

UNIT II RELATIONAL MODEL

UNIT III DATABASE DESIGN

UNIT IV TRANSACTIONS

UNIT V IMPLEMENTATION TECHNIQUES

TOTAL: 45

TEXT BOOKS:

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

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

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

TOTAL: 45

HARDWARE AND SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS

HARDWARE:
- 30 Personal Computers

SOFTWARE:
- Linux: Ubuntu / OpenSUSE / Fedora / Red Hat / Debian / Mint OS Linux could be loaded in individual PCs.
  (OR)
- A single server could be loaded with Linux and connected from the individual PCs.
BCS432 DATABASE MANAGEMENT SYSTEMS LABORATORY (Common to CSE & IT) 0 0 3 2

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

TOTAL: 45

HARDWARE AND SOFTWARE REQUIRED FOR A BATCH OF 30 STUDENTS:

HARDWARE:
- 30 Personal Computers

SOFTWARE:
- Front end : VB/VC ++/JAVA
- Back end: Oracle 11g, MY SQL, DB2
- Platform: Windows 2000 Professional/XP
- Oracle server could be loaded and can be connected from individual PCs.
BCS433  MICROPROCESSORS LABORATORY                         L T P C
         (Common to CSE & IT)                           0  0  3  2

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

OBJECTIVES:
• To implement the assembly language programming of 8085, 8086 and 8051.
• To study the system function calls like BIOS/DOS.
• To experiment the interface concepts of various peripheral device with the processor.

EXPERIMENTS IN THE FOLLOWING:
1. Programming with 8085.
2. Programming with 8086 - experiments including BIOS/DOS calls: Keyboard control,
   Display, File Manipulation.
3. Interfacing with 8085/8086-8255, 8253.
4. Interfacing with 8085/8086-8279, 8251.
5. 8051 Microcontroller based experiments for Control Applications.
6. Mini- Project.

TOTAL: 45

LIST OF EQUIPMENTS/COMPONENTS FOR 30 STUDENTS (2 PER BATCH)

1. 8085 Trainer Kit with onboard 8255, 8253, 8279 and 8251 – 15 nos.
2. TASM/MASM simulator in PC (8086 programs) – 30 nos.
3. 8051 trainer kit – 15 nos.
4. Interfacing with 8086 – PC add-on cards with 8255, 8253, 8279 and 8251 – 15 nos.
5. Stepper motor interfacing module – 5 nos.
7. ADC, DAC interfacing module – 5 nos.
8. CRO’s – 5 nos.
BEG431  COMMUNICATION SKILLS AND TECHNICAL SEMINAR – II
(Common to all branches)
(To be conducted as a Practical Paper by the Depts of English for 3 hrs per week)

L T P C
0 0 3 2

OBJECTIVES:
1. To improve the learners’ oral fluency in English
2. To help the learners acquire the readiness to speak in English
3. To develop the sub-skills required for paper presentations and group discussions
4. To help the learners improve their vocabulary related to specific fields of technology
5. To facilitate the development of the learners’ proficiency in meaningful interaction
6. To provide them linguistic support for managing vital sub-functions of communication.

COURSE CONTENT:
A) Phonetic practice ( 7 hrs)
All the English phonemes with special emphasis on the following
1. /ae/ and /ei/
2. /e/ and /i/
3. First syllable and second syllable stress
4. Three different ways of pronouncing ‘ed’ past tense endings eg. ‘played’, ‘walked’, ‘wanted’
5. Correct pronunciation of commonly used words ( A list of 1000 words will be suggested by the university)
6. Silent letters

B) Speech practice ( 8 hrs)
Speaking on the themes by developing the hints provided.
The themes are:
1. Indian space missions
2. Converting agricultural wastes for useful purposes
3. Developments in transportation
4. Technology and agriculture
5. Impact of global warming
6. Desalination of water
7. Technology for national security
8. Industrial development and ecological issues
9. Applications of nano technology
10. Hazards of e-waste

C) Preparation of power point frames on the given topic (2 hrs)
(Only pictures, graphs, equations should be given through power point and not the text of the presentation as such)

D) Language Functions (14 hrs)
Reporting the conversation of others
Using the third conditional
Expressing agreement and disagreement
Numerical expressions
Describing manner and frequency
Evaluating different standpoints
Developing an argument
Describing daily routines, events, and weather
D) Seminar presentation on the themes allotted using power point frames (14 hrs)

PROCEDURE:

A) Phonetic practice
The learners should be given drills in the pronunciation of at least 30 words for each sound. While practicing stress patterns, they should be encouraged to identify as many words as possible for each pattern.

B) Speech practice
Every student should be allowed to choose one theme to specialize in. (However not more than 7 students in a section can choose the same theme). The teacher has to prepare at least 4 hints development tasks on each theme and should provide chance to each learner to speak on those hints related to his/ her theme (5 minutes). The hints may be supplied to the students in advance. When a student speaks, the class should be encouraged to ask questions as well as note down the words related to the different fields.

C) 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.

D) Seminar presentation on the themes allotted
Each student should collect materials from books, journals and newspapers for his/her theme and prepare a short seminar paper. The presentation should be for 10 minutes using power point frames. It should be followed by an ‘open house’ during which others should come forward to question, clarify, supplement or evaluate.

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.
- Twenty words for each phoneme /ae/, /ei/, /i/ and /e/
- Fifty words with first syllable stress and fifty for second syllable stress (The learner will be required to pronounce some of these words during the practical exam)
- Vocabulary list (technical words and compound words) related to the 10 themes identified for this semester.
- Three newspaper items, two journal items and three internet sources related to the special theme selected by the student. (To be pasted on the pages)
- The seminar paper presented by the learner with a soft copy of the power point frames.
- Notes of observation. (Details about any two seminar paper presentations by others)
- The record should be duly signed by the course teacher and submitted to the External Examiner for verification during the semester practicals.

P = 45 Total = 45
BMA501 DISCRETE MATHEMATICS L T P C
3 1 0 4

OBJECTIVES
At the end of the course, the students would
• Have knowledge of the concepts needed to test the logic of a program.
• Have an understanding in identifying structures on many levels.
• Be aware of a class of functions which transform a finite set into another finite which relates to input output functions in computer science.
• Be aware of counting principles.
• Be exposed to concepts and properties of Lattices.

UNIT I LOGIC AND PROOFS 9+3
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 9+3
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 9+3
The basics of counting –The pigeonhole principle-Permutations and combinations –Recurrence relation - Solving Linear recurrence relations – Generating functions -Principles of inclusion and exclusion.

UNIT IV LATTICE THEORY 9+3

UNIT V GRAPH THEORY 9+3
Graphs and graph models-Graph terminology and special types of graphs –Representing graphs and graph isomorphism-connectivity - Euler and Hamiltonian graphs.

TOTAL: 60

TEXT BOOKS

REFERENCES
BCS501  JAVA PROGRAMMING   L T P C
3 1 0 4

OBJECTIVES
- To understand the basics of java
- To understand the concepts of inheritance, interfaces, packages, strings and exception handling in java
- To learn the concepts of file handling and threads
- To develop simple application programs using applets and event handling

UNIT I  JAVA FUNDAMENTALS  9+3
The Genesis of Java -An Overview - Simple java program - Keywords - Identifiers and constants - Data types - Type Conversions and Casting – Arrays - Operators - Control statements.

UNIT II  JAVA CLASSES  9+3

UNIT III  INHERITANCE, STRINGS AND EXCEPTION HANDLING  9+3

UNIT IV  FILE HANDLING AND THREADS  9+3

UNIT V  APPLETS AND EVENT HANDLING  9+3

TOTAL: 60

TEXT BOOKS

REFERENCES
BCS502 COMPUTER NETWORKS (Common to CSE & IT)  

OBJECTIVES
- To study the concepts of communications and network architecture.
- To understand the network classifications and design principles.
- To study about the switching concepts and routing protocols.
- To learn about the various layering protocols.

UNIT I INTRODUCTION 9
Communication model - Data communications networking - Data transmission concepts and terminology - Transmission media - Data encoding - Data link control.

UNIT II NETWORK FUNDAMENTALS 9

UNIT III NETWORK LAYER 9

UNIT IV TRANSPORT LAYER 9

UNIT V APPLICATION LAYER 9
Applications - Sessions and presentation aspects - DNS, Telnet - rlogin - FTP - SMTP - WWW - Security - SNMP.

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS503  THEORY OF COMPUTATION  L T P C  
(Common to CSE & IT)  3 1 0 4

OBJECTIVES
- To have an understanding of finite state and pushdown automata.
- To have a knowledge of regular languages and context free languages.
- To know the relation between regular language, context free language and corresponding recognizers.

UNIT I  AUTOMATA  7+3
Introduction to formal proof - Additional forms of proof - Inductive proofs - Finite Automata (FA) - Deterministic Finite Automata (DFA) - Non-deterministic Finite Automata (NFA) - Finite Automata with Epsilon transitions.

UNIT II  REGULAR EXPRESSIONS AND LANGUAGES  10+3
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  10+3

UNIT IV  PROPERTIES OF CONTEXT-FREE LANGUAGES  9+3
Normal forms for CFG - Pumping Lemma for CFL - Closure Properties of CFL – Turing Machines - Programming Techniques for TM.

UNIT V  UNDECIDABILITY  9+3
A language that is not Recursively Enumerable (RE) - An un-decidable problem that is RE- Undecidable problems about Turing Machine - Post’s Correspondence Problem - The classes P and NP.

TOTAL: 60

TEXT BOOK

REFERENCES
BCS504 SOFTWARE ENGINEERING METHODOLOGIES  L T P C
3 0 0 3

OBJECTIVES

- To provide the basic knowledge and principles in software engineering.
- To learn various techniques required for efficient development of software.

UNIT I INTRODUCTION TO SOFTWARE ENGINEERING


UNIT II SOFTWARE PROJECT ANALYSIS


UNIT III SOFTWARE DESIGN CONCEPTS


UNIT IV SOFTWARE IMPLEMENTATION AND TESTING

Implementation issues: Introduction - Structured coding techniques - Coding style - Standards and guidelines - Documentation guidelines - Modern programming languages features - PL characteristics. Testing strategies: Strategic approach to software testing- Strategic issues-Test strategies for conventional software-Validation testing-System testing-Art of debugging. Testing tactics: White-box testing-Basic path testing-Control structure testing-Black-box testing.

UNIT V MANAGEMENT AND MAINTENANCE OF SOFTWARE PROJECTS


TOTAL: 45

TEXT BOOK


REFERENCES

BCS531 JAVA PROGRAMMING LABORATORY L T P C
0 0 3 2

OBJECTIVES
• Creating classes and objects using Java;
• Implementing constructors and constructor overloading;
• Solving problems using Inheritance and Polymorphism;
• Create your own package and interface;
• Handling exceptions arising in programs;
• Use of multithreading in programs.
• Work on strings.
• Use GUI components in your programs;

LIST OF EXERCISES
1. Programs illustrating various data types in Java.
2. Programs illustrating class, objects and methods.
3. Programs to manipulate strings.
4. Programs illustrating Overloading in Java.
5. Programs illustrating Overriding methods in Java.
6. Programs illustrating Exception Handling.
7. Programs illustrating the implementation of various forms of Inheritance (Single, Hierarchical, Multilevel).
8. Programs illustrating Interfaces in Java.
9. Programs to create Packages in Java.
10. Programs illustrating applications of threads in Java.
11. Programs illustrating Applet development in Java.
13. Reading and writing text files.
14. Reading image files and manipulating them using image related classes and methods.
BCS532  NETWORKS LABORATORY  L  T  P  C
0  0  3  2

OBJECTIVES
- Learn TCP and UDP socket programming.
- Simulation of various protocols
- Study and Implement Routing Algorithms
- Study of NS2, Qualnet network simulators

LIST OF EXERCISES
1. Implementation of date and time server using TCP Sockets.
2. Implementation of echo server using TCP Sockets.
3. Programs using UDP Sockets (like simple DNS)
4. Programs using raw sockets (like packet capturing and filtering).
5. Programs using RPC.
7. Implementation of routing protocol using BGP.
8. Implementation of OSPF routing protocol based on the cost.
10. Experimental study of application protocols such as HTTP, FTP, SMTP, using network packet sniffers and analyzers such as Ethereal.
11. Experiments with packet sniffers to study the TCP protocol. Using OS (netstat, etc) tools to understand TCP protocol FSM, retransmission timer behavior and congestion control behavior.
12. Setting up a small IP network - configure interfaces, IP addresses and routing protocols to set up a small IP network. Study dynamic behaviour using packet sniffers.
13. Experiments with NS2 or Qualnet to study behaviour (especially performance) of link layer protocols such as Ethernet and 802.11 wireless LAN.

SUGGESTED SOFTWARE TOOLS
- C/C++/JAVA
- NS2/Qualnet
- Ethereal (network packet sniffer)
BGE501 PROFESSIONAL ETHICS AND HUMAN VALUES  L  T  P  C
(Common to 5th Sem – EEE, EIE, Civil & IT
6th Sem – CSE & ECE)  3 0 0 3

OBJECTIVES
- To create an awareness on Engineering Ethics and Human Values.
- To instill Moral and Social Values and Loyalty.
- To appreciate the rights of others.

UNIT I HUMAN VALUES  10

UNIT II ENGINEERING ETHICS  9

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

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS  9

UNIT V GLOBAL ISSUES  8
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 of ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers (IETE), India.

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS601 SYSTEM SOFTWARE AND COMPILER DESIGN L T P C
3 1 0 4

OBJECTIVES
- To learn the design and implementation of assemblers, linkers and loaders.
- To study about the phases of compiler, code generation, optimization techniques.

UNIT I ASSEMBLERS 9+3

UNIT II LOADERS AND LINKERS 9+3

UNIT III COMPILER AND LEXICAL ANALYZER 9+3
Introduction to Compiler: Compilers and Translators - The Structure of a Compiler - Compiler Writing Tools - Lexical Analysis: The role of the lexical analyzer - implementation of a lexical analyzer.

UNIT IV PARSERS 9+3
Syntax Analysis - Shift reduce parsing - operator precedence parsing - top down parsing - predictive parsers - LR parsers - The canonical collection of LR(0) Items - Constructing SLR parsing tables - Constructing canonical LR parsing tables.

UNIT V CODE GENERATION AND OPTIMIZATION 9+3

TOTAL: 60

TEXT BOOKS

REFERENCES
BCS602 OBJECT ORIENTED ANALYSIS AND DESIGN (Common to CSE & IT) 3 0 0 3

OBJECTIVES
- To learn basic object oriented analysis and design skills through an elaborate case study.
- To understand and use the UML diagrams for analysis and design.
- To apply the appropriate design patterns and frameworks.

UNIT I INTRODUCTION 9

UNIT II UNIFIED MODELLING LANGUAGE 9

UNIT III OBJECT ORIENTED METHODOLOGIES 9
Rumbaugh Methodology - Booch Methodology - Jacobson Methodology – Patterns Frameworks - Unified Approach.

UNIT IV OBJECT ORIENTED ANALYSIS 9
Identifying use cases - Object Analysis - Classification - Identifying Object relationships - Attributes and Methods.

UNIT V OBJECT ORIENTED DESIGN 9

TOTAL: 45

TEXT BOOK

REFERENCES
BCS603  ARTIFICIAL INTELLIGENCE AND ROBOTICS

OBJECTIVES

- To learn the basics of designing intelligent agents that can solve general purpose problems, represent and process knowledge, plan and act, reason and can learn from experiences.
- To familiarize the terminologies used in Robotic Systems and understand the robotics programming.

UNIT I  PROBLEM SOLVING

UNIT II  LOGICAL REASONING
Logical agents - propositional logic - inferences - first-order logic - inferences in first order logic - forward chaining - backward chaining - unification - resolution.

UNIT III  PLANNING
Planning with state-space search - partial-order planning - planning graphs - planning and acting in the real world.

UNIT IV  LEARNING
Learning from observation - Inductive learning - Decision trees - Explanation based Learning - Statistical learning methods - Reinforcement Learning.

UNIT V  ROBOTICS

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS604 WEB PROGRAMMING

OBJECTIVES

- To understand the evolution of the Internet and the WWW.
- To understand important components of HTML documents.
- To be able to markup data using XML.
- To execute servlets with the Apache Tomcat server.
- To be able to create and deploy JSP and J2ME.
- To construct programs using PHP, that interacts with MySQL databases

UNIT I HTML PROGRAMMING

9

UNIT II XML PROGRAMMING


UNIT III SERVLET PROGRAMMING

9

UNIT IV WEB SERVER PROGRAMMING

9
Introduction to JSP: The problem with servlets - The anatomy of a JSP page - JSP processing. JSP application design with MVC architecture. JSP application development: Generating dynamic content, using scripting elements. Implicit JSP objects, Conditional processing – Displaying values using an expression to set an attribute, declaring variables and methods - Error handling and debugging - Sharing data between JSP pages – Requests - Users passing control and Date between Pages – Sharing Session and Application data – Memory usage considerations.

UNIT V WEB DATABASE PROGRAMMING

9

PRACTICAL HOURS: 15 TOTAL: 60

TEXT BOOKS

REFERENCES
BCS631 SYSTEM SOFTWARE AND COMPILER DESIGN LABORATORY

OBJECTIVES
- To explore the development of assembler, macro processor, direct linking loader modules for a subject of assembly language and macro instructions of typical machine.
- To study the direct linking loader module for a subset of assembly language and macro instructions of a typical machine.
- To edify the lexical analyzing tools like LEX/YACC.

LIST OF EXERCISES
1. Implement a Symbol Table with the following operations: Creation, Insertion, Modification, Searching and displaying the contents.
2. Implement a two pass Assembler.
3. Implement an Absolute Loader.
4. Implement pass one of a direct Linking Loader.
5. Implement Lexical Analyzer.
6. Implement a parser for the given Grammar.
7. Design a DAG for the given mathematical expression.
8. Implement Recursive Descent Parser for an Expression Grammar that generates Arithmetic Expressions with Digits, + and *.
10. Implement the Back end of the Compiler which takes the Three Address Code as an Input and Produce the 8086 Assembly Language Instruction that may be assembled and run using 8086 Assembler. The target Assembly Instructions may be simple Move, Add, Sub, and Jump.

SUGGESTED SOFTWARE TOOLS
- C/C++
- LEX/YACC
- MASM Assembler
BCS632  OBJECT ORIENTED ANALYSIS AND DESIGN
LABORATORY  
(Common to CSE & IT)  0 0 3 2

OBJECTIVES
- To impart working knowledge of UML, source control, and project management.
- To inculcate deep knowledge of the technologies for implementing their project.
- Ability to present their work in a professional manner.
- To design and implement complex software solutions using state of the art software engineering techniques.

ACTIVITIES TO BE PERFORMED
- To develop a problem statement.
- Develop SRS document, risk management and project plans.
- Identify Use Cases and develop the Use Case diagrams.
- Identify the business activities and develop UML Activity diagrams.
- Identify the conceptual classes and develop UML Class diagrams.
- Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
- Draw the State Chart diagrams.
- Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
- Implement the Technical services layer.
- Implement the Domain objects layer.
- Implement the User Interface layer.
- Draw Component and Deployment diagrams.

LIST OF EXERCISES
1. Passport Automation System.
2. Book Bank Management System.
4. Online Course Registration System.
5. Software Personnel Management System.
6. Credit Card Processing System.
7. Online Shopping.
8. Recruitment System.
11. ATM Banking.

SUGGESTED SOFTWARE TOOLS
- Rational Suite/ ArgoUML/ Eclipse IDE
- Visual Basic / Visual C++/Java
BCS633  COMPREHENSION  L  T  P  C
0  0  3  1

OBJECTIVES
- To encourage the students to pursue their higher education.
- To prepare the students to undergo GATE like entrance exams.
- To evaluate the comprehensive knowledge being acquired by the student.

COURSE CONTENT AND LAYOUT
- The students will select a particular group of subjects as mentioned below to review their competency level:

  **Group A**
  i. Data Structures and Algorithms
  ii. Compiler Design
  iii. Operating systems
  iv. Web Technology
  v. Database Management Systems
  vi. Digital logic design

  **Group B**
  i. C and OO Programming
  ii. Theory of Computation
  iii. Computer Networks
  iv. Software Engineering
  v. Database Management Systems
  vi. Computer Organization and Architecture

- The staff-coordinator per group is responsible for scheduling the session plans, monitoring the activities and recording the continual assessments.
- The technical seminars and group discussions will be assisted by subject experts in the department.
- Each student must participate in all the activities and their performance assessment must be recorded.

SUGGESTED ACTIVITIES
- Group Discussion
- Technical Seminars
- Objective type test solving skills
- Mock GATE Examination
- Comprehensive Viva
BCS701 COMPUTER GRAPHICS AND VISUALIZATION

OBJECTIVES
- To learn algorithms for rendering, modeling and transformations.
- To cover mathematical and theoretical foundations of computer graphics.
- To explore practical programming through OpenGL.
- To understand effect of visualization of complex scenes in movies and games.

UNIT I 2D PRIMITIVES
Output primitives – Line, Circle and Ellipse generating algorithms – Attributes of output primitives – Two dimensional Geometric transformations – Matrix representations and homogeneous coordinates, Composite transformations, Reflection – shearing.

UNIT II WINDOWING AND CLIPPING

UNIT III THREE DIMENSIONAL PRIMITIVES

UNIT IV COLOR MODELS AND OPENGL PROGRAMMING

UNIT V VISUALIZATIONS
Maya user interface – Learn to work in 3D space – Workspace – Modeling – Animation – Shading – Lighting – Rendering.

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS702 MOBILE APPLICATION DEVELOPMENT L T P C
3 0 0 3

OBJECTIVES
- Learn the concepts and learn the tools for developing applications on mobile platforms like Android.
- Describe those aspects of mobile programming that make it unique from programming for other platforms.
- Critique mobile applications on their design pros and cons.
- Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
- Program mobile applications for the Android operating system that use basic and advanced phone features and
- Deploy applications to the Android marketplace for distribution.

UNIT I INTRODUCTION 9

UNIT II USER INTERFACE 9

UNIT III APPLICATION DESIGN 9

UNIT IV APPLICATION DEVELOPMENT 9

UNIT V TOOLS 9

TOTAL: 45

REFERENCES
BIT011  CLOUD COMPUTING  
(Common to IT & CSE)  
L T P C  3 0 0 3

OBJECTIVES

• To understand the fundamentals of cloud computing
• To study about the web based applications in cloud
• To know about the use of cloud computing

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

TOTAL: 45

TEXT BOOKS

OBJECTIVE
- To learn about the basics of economics and financial accounting related to engineering so as to take economically sound decisions.

UNIT I INTRODUCTION
Managerial Economics - Relationship with other disciplines – Forms of business organization: Meaning – Types, Formation, Merits and Demerits - Managerial decision making – Process – Types of decision and Decision analysis.

UNIT II DEMAND & SUPPLY ANALYSIS
Demand - Types of demand - Determinants of demand - Demand function - Demand elasticity - Demand forecasting - Supply - Determinants of supply - Supply function - Supply elasticity.

UNIT III PRODUCTION AND COST ANALYSIS

UNIT IV PRICING AND INVESTMENT ANALYSIS (ELEMENTARY TREATMENT)
Determinants of Price - Pricing under different objectives and different market structures - Price discrimination - Pricing methods in practice - Investments decision analysis - Risks and return evaluation of investment decision - Average rate of return - Payback Period - Net Present Value - Internal rate of return.

UNIT V FINANCIAL ACCOUNTING (ELEMENTARY TREATMENT)

TOTAL: 45

1. TEXT BOOKS

REFERENCES
BCS731  COMPUTER GRAPHICS AND VISUALIZATION
LABORATORY
L    T    P    C
0    0    3    2

OBJECTIVES
• To provide hands-on experience on developing interactive, real-time rendering applications.
• To develop skills for comparing various methods for computer representation of objects.
• To illustrate the use of 3D viewing, rendering models.
• To open up 3D visualization world (architectural, medical, biological, etc.

LIST OF EXERCISES
1. Implementation of Bresenham’s Algorithm – Line, Circle and Ellipse generation.
2. Two Dimensional transformations – Translation, Rotation and Scaling.
3. Two Dimensional Reflection and Shear transformations.
5. Cohen Sutherland’s 2D Line clipping and Windowing algorithms.
6. Sutherland – Hodgeman’s Polygon clipping algorithm.
7. Three dimensional transformations - Translation, Rotation and Scaling.
8. Composite 3D transformations.
9. Drawing three dimensional Objects and Scenes.
10. Create the visual effects using Maya design tool - Animation, Modeling, Lighting, Effect and Rendering.

TOTAL: 45

SUGGESTED SOFTWARE TOOLS
• C/C++ Compiler
• OpenGL
• Maya
BCS732 MOBILE APPLICATION DEVELOPMENT LABORATORY

OBJECTIVES

• Develop a working knowledge of Android application development tool.
• Understand mobile application design principles.
• Describe and apply the different types of application models and architectures used to develop mobile software applications.
• Describe the components and structure of a mobile development frameworks and learn how and when to apply the different components to develop a working system.
• Design, implement and deploy mobile applications using an appropriate software development environment.

LIST OF EXERCISES

1. Case Study on setting up mobile application development environment.
2. Develop an Instant Messaging application using Java SE for normal desktop PC for the following theme. Two users should able to do IM between each other identified through IP address/port.
3. Display Hello World.
4. Add two Edit Text. When a number is entered in Edit Text 1, the square of that number should be displayed in Edit Text 2.
5. Add an Edit Text and a button. When the button is clicked, the text inputted in Edit Text should be retrieved and displayed back to the user.
6. Add two Edit Text and a button. When the button is clicked, the text inputted in Edit Text 1 should be retrieved and displayed in EditText2.
7. Design a calculator using mobile application tools.
8. Create a Module converter for height and weight in the same application. Selection of height/weight can be done using a spinner.
9. Create applications to include Action Bar, Menus, Dialogs and Notifications
10. Create a camera application, where you can click a picture and then save it as the wallpaper.

TOTAL: 45

Mini Project

Installation and demonstration of a Mobile Application Wizard.

Hardware and Software Requirements for a batch of 30 students:

Hardware:
• 30 Personal Computers

Software:
• JDK, Eclipse, Android SDK, Eclipse, Android Emulator, Sqlite-3 and ADT. Install all of these in individual PC.
• XCODE, IOS SDK and virtual box for MAC OSX
OBJECTIVES

- To determine software testing objectives and criteria
- To select and prepare test cases
- To identify the various levels and need for testing
- To incorporate testing into the software development life cycle
- To prepare testing policies and standards
- To understand the role of testing aids and tools

UNIT I    INTRODUCTION  8

UNIT II   TEST CASE DESIGN  9

UNIT III LEVELOS OF TESTING  11

UNIT IV  TEST MANAGEMENT  8

UNIT V   TEST AUTOMATION  9
Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation - Test metrics and measurements – project, progress and productivity metrics

TOTAL: 45

TEXT BOOKS

REFERENCES
BMG601  PRINCIPLES OF MANAGEMENT  L T P C
   3 0 0 3

OBJECTIVES
- To get the skills needed to successfully manage an organization.
- To understand concepts of strategic and tactical organizational planning.
- Implement employee motivational approaches and conflict management skills.
- To describe common performance appraisal processes.
- To understand group and team management, management development, and employee training.
- Describe concepts of controlling and control systems.

UNIT I  FOUNDATIONS  9

UNIT II  MANAGERS AND ENVIRONMENT  9

UNIT III  FUNCTIONAL AREA OF ORGANISATION  9

UNIT IV  MOTIVATION AND DIRECTIONS  9

UNIT V  CONTROLLING STRATEGIES  9

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS001 ADVANCED DATABASE TECHNOLOGY (Common to CSE & IT) 3 0 0 3

OBJECTIVES
- To understand relational data model and its use in Database design.
- To study the concepts of database development and administration.
- To learn the contemporary architecture of database systems.
- To survey the characteristics of various advanced databases.

UNIT I RELATIONAL MODEL ISSUES 9

UNIT II DISTRIBUTED DATABASES 9
Distributed Database Features - Architecture of distributed databases – DDBS design - Distributed Query Processing - Distributed transactions processing - Concurrency control - Recovery control - Commit Protocols.

UNIT III OBJECT ORIENTED DATABASES 9
Object-oriented data models - Object Identity and its implementation – Supporting object modeling in database systems--Database programming and querying in object-oriented databases - ODMG standard, including ODL, OQL – Comparing RDBMS with OODBS

UNIT IV ADVANCE DATABASE MODEL 9

UNIT V CURRENT ISSUES 9

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS002  SOCIAl NETWORKS  L T P C
3 0 0 3

OBJECTIVES
- To expose fluency in the specialized language of social network analysis.
- To improve Skills in communicating Social Network concepts and methods to specialists and laypersons.
- To provide Proficiency in the general social network research process from data collection to reporting.
- To focus, the high level of proficiency in one or more specific domains of network analysis.

UNIT I  INTRODUCTION  9
Introduction: Motivation - Different Sources of Network Data - Types of Networks - Tools for Visualizing Network Data - Review of Graph Theory Basics.

UNIT II  STRUCTURAL AND LOCATIONAL PROPERTIES  9

UNIT III  MARKET AND STRATEGIC INTERACTION IN NETWORK  9

UNIT IV  NETWORK DYNAMICS AND POPULATION MODELS  9
Information Cascade - Networks Effects - The Economy with Network Effects Industries with Network goods - Advanced Materials for Positive Externalities - Power Laws - The Effect of Search Tools and Recommendations.

UNIT V  INSTITUTION AND AGGREGATE BEHAVIOR  9

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS003 UNIX INTERNALS (Common to CSE & IT)  3 0 0 3

OBJECTIVES
- To explore the design concepts of UNIX OS
- To understand the functional components of UNIX

UNIT I OVERVIEW OF UNIX OS  7

UNIT II KERNEL DATA STRUCTURES  9
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  10

UNIT IV PROCESS MANAGEMENT AND CONTROL  10

UNIT V MEMORY AND I/O SUBSYSTEM  9
Memory Management Policies - Swapping - Demand Paging - a Hybrid System - I/O Subsystem - Driver Interfaces - Disk Drivers - Terminal Drivers.

TOTAL: 45

TEXT BOOK

REFERENCES
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<td>BCS004</td>
<td>OPEN SOURCE SYSTEMS</td>
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**OBJECTIVES**

- To address open issues and adapt the Open Source Technologies.
- To ensure competency level of Open Source Software solutions on par with Proprietary solutions.

**UNIT I HISTORY AND OVERVIEW OF LINUX**


**UNIT II OPEN SOURCE DATABASE AND BOOT OPERATIONS**

MySQL: Introduction – Setting up account – Basics of SQL programs – Record selection technology – Working with strings – Date and Time – Sorting Query Results – Working with metadata – Configuring additional hardware – Understanding the OS boot up process – Detect Display Devices – Installing Software – Setting up Email Servers (SMTP services) – Courier (IMAP & POP3 services) – Squirrel Mail (web mail services) – Setting up web servers (Apache) – Perl programming – Setting up File Services using Samba.

**UNIT III OPEN SOURCE PROGRAMMING LANGUAGES**


**UNIT IV OPEN SOURCE COMPILER**

Setting up a firewall – Using net filter and IP tables – Using the GNU Compiler Collection - GNU compiler tools – Pre-processor, C/C++ compiler, GAS assembler – Using source code versioning and Management tools – using CVS to manage source code revisions – patches.

**UNIT V OPEN SOURCE LIBRARIES AND LINKERS**


**TOTAL:** 45

**REFERENCES**

4. [www.sco.com/skunkware/devtools](http://www.sco.com/skunkware/devtools)
BCS005 C# AND .NET TECHNOLOGIES L T P C
(Common to CSE & IT) 3 0 0 3

OBJECTIVES
• To provide an awareness of the .NET Environment.
• To deliver C# program based on the Microsoft .Net Framework including console applications and class libraries.
• To study about the applications of XML in .NET and ADO.NET.

UNIT I OVERVIEW OF .NET 9

UNIT II CONCEPTS OF C# 9

UNIT III FILE I/O AND OBJECTS 9

UNIT IV ADO.NET 9
ADO.NET Architecture - ADO.NET Connected and Disconnected layers – Entity frame work – Introducing LINQ to XML.

UNIT V ASP.NET 9

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS006 CRYPTOGRAPHY AND NETWORK SECURITY
(Common to CSE & IT)

OBJECTIVES
• To analyze the various methods of conventional encryption.
• To understand the concepts of public key encryption and number theory.
• To understand Authentication and Hash functions.
• To learn the network security tools and applications.

UNIT I INTRODUCTION
Overview - Classical Encryption techniques - Block Ciphers - Data Encryption Standard - Block Cipher Design Principles and Modes of Operation - Evaluation criteria for AES - AES Cipher – Triple DES.

UNIT II PUBLIC KEY CRYPTOGRAPHY

UNIT III AUTHENTICATION AND HASH FUNCTION

UNIT IV NETWORK SECURITY

UNIT V SYSTEM LEVEL SECURITY
Intrusion detection - password management - Viruses and related Threats - Virus Counter measures - Firewall Design Principles - Trusted Systems.

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS007 DATA WAREHOUSING AND DATA MINING  L T P C
(Common to CSE & IT)  3 0 0 3

OBJECTIVES
- To identify data warehouse architecture and necessity for data mining.
- To learn the importance and methods of data preprocessing.
- To understand the concepts of data warehousing and OLAP.
- To understand the data mining techniques and their applications.
- To provide insight on Big data issues.

UNIT I DATA WAREHOUSE AND OLAP TECHNOLOGY  9
Introduction to Data Warehousing - Data warehousing Components - Building a Data warehouse - Mapping the Data Warehouse to a Multiprocessor Architecture - DBMS Schemas for Decision Support - Data Extraction, Cleanup, and Transformation Tools - Metadata - Business analysis reporting, Query tools and Applications - Online Analytical Processing (OLAP) - OLAP and Multidimensional Data model.

UNIT II DATA PREPROCESSING  9
Data Mining - Data Mining Functionalities - Data Preprocessing - Data Cleaning - Data Integration and Transformation - Data Reduction - Data Discretization and Concept Hierarchy Generation.

UNIT III ASSOCIATION RULES  9

UNIT IV CLASSIFICATION AND CLUSTERING  9
Classification and Prediction, Issues - Decision Tree Induction - Bayesian Classification - Rule based classification - Other Classification Methods - Prediction - Accuracy and Error Measures - Cluster Analysis - Types of data - Categorization of Clustering methods - Partitioning methods - Hierarchical Methods - Outlier Analysis.

UNIT V MINING MULTIMODAL DATA  9

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS008  ADVANCED COMPUTER ARCHITECTURE L T P C
3 0 0 3

OBJECTIVES
• To study the ISA design, instruction pipelining and performance issues.
• To have a detailed study of ILP using dynamic/software approaches.
• To study the multiprocessor and multi-core architectures and related issues.
• To study the Memory and I/O systems and their performance issues.

UNIT I  INSTRUCTION LEVEL PARALLELISM 9
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 9
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 9
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 9
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 9
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.

TOTAL: 45

TEXT BOOKS

REFERENCE
BCS009 HIGH SPEED NETWORKS L T P C
(Common to CSE & IT) 3 0 0 3

OBJECTIVES
• To provide an understanding of the networking standards that can be adopted with the current day requirements of complex and voluminous content transfer over heterogeneous platforms.
• To have a primitive level performance analysis for of traffic with different networking standards and to study the standards adopted for handling high traffic.
• To get a feel of designing a High speed network setup with specialized hardware and optimization approaches like parallelism and pipelining.

UNIT I HIGH SPEED NETWORKS

UNIT II CONGESTION AND TRAFFIC MANAGEMENT

UNIT III TCP AND ATM CONGESTION CONTROL

UNIT IV INTEGRATED AND DIFFERENTIATED SERVICES

UNIT V PROTOCOLS FOR QOS SUPPORT

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS010 ADVANCED JAVA PROGRAMMING  L  T  P  C
(Common to CSE & IT)  3  0  0  3

OBJECTIVES
- To learn advanced Java programming concepts like reflection, native code interface, threads, etc.
- To develop network programs in Java.
- To understand concepts needed for distributed and multi-tier applications.
- To understand issues in enterprise applications development.

UNIT I  JAVA 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

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS011  IT INFRASTRUCTURE MANAGEMENT  L T P C
3 0 0 3

OBJECTIVES
• To understand the basic infrastructure management activities.
• To learn various infrastructure management schemes.
• To know the basic need of infrastructure services such as delivery processes, support processes and storage and security management processes.

UNIT I  INFRASTRUCTURE MANAGEMENT OVERVIEW  9

UNIT II  PREPARING FOR INFRASTRUCTURE MANAGEMENT  9

UNIT III  SERVICE DELIVERY PROCESSES  9
Service-level management – Financial management and costing – IT services continuity management – Capacity management – Availability management.

UNIT IV  SERVICE SUPPORT PROCESSES  9

UNIT V  STORAGE AND SECURITY MANAGEMENT  9

TOTAL: 45

TEXT BOOKS

REFERENCES
**BCS012  GAME THEORETICAL MODEL AND COMPUTATION**

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**OBJECTIVES**

- To provide a conceptual overview to the tools of game theory and some of its applications.
- To know the concepts of Game theory in Wireless Network Applications.
- To analyze situations in which two or more individuals (or firms, political parties, countries) interact in a strategic manner.
- To 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 – Repeated Games.

**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


**TOTAL: 45**

**TEXT BOOKS**


**REFERENCES**

BCS013  M-COMMERCE  L T P C  3 0 0 3

OBJECTIVES
- Recognize the business principles of M-Commerce
- Understand the various technical Support for M-Commerce
- Able to build business models using M-Commerce approaches

UNIT I  INTRODUCTION  9

UNIT II  NETWORK INFRASTRUCTURE  9

UNIT III  MOBILE COMMERCE TECHNOLOGY  9
NTT Docomos’s I-Mode - Towards a Classification Framework for Mobile Location Based Services - Wireless Personal and Local Area Networks - The Impact of Technology Advances on Strategy Formulation in Mobile Communications Networks.

UNIT IV  MOBILE COMMERCE: THEORY AND APPLICATIONS  9

UNIT V  BUSINESS-TO-BUSINESS MOBILE E-COMMERCE  9
A perspective on M-Commerce – Location based services: criteria for adoption and solution deployment - MCommerce in the automotive industry making a case for strategic partnerships- Case study: The Role of Mobile advertising in building a brand.

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS014 QUANTUM COMPUTING L T P C
3 0 0 3

OBJECTIVES
- To understand the building blocks of a quantum computer
- To understand the principles, quantum information and limitation of quantum operations formalizing
- To understand the quantum error and its correction.

UNIT I FUNDAMENTAL CONCEPTS
Global Perspectives, Quantum Bits, Quantum Computation, Quantum Algorithms, Quantum Information, Postulates of Quantum Mechanisms.

UNIT II QUANTUM COMPUTATION

UNIT III QUANTUM COMPUTERS

UNIT IV QUANTUM INFORMATIONS
Quantum noise and Quantum Operations – Classical Noise and Markov Processes, Quantum Operations, Examples of Quantum noise and Quantum Operations – Applications of Quantum operations, Limitations of the Quantum operations formalism, Distance Measures for Quantum information.

UNIT V QUANTUM ERROR CORRECTION

TOTAL: 45

TEXT BOOKS

REFERENCES
1. Nayak, Chetan; Simon, Steven; Stern, Ady; Das Sarma, Sankar, “Nonabelian Anyons and Quantum Computation”, 2008.
BMG004 RESOURCE MANAGEMENT TECHNIQUES  L T P C
3 0 0 3

OBJECTIVES:
- To acquaint the student with the application of various techniques to business.
- To grasp the significance of analytical techniques in decision making.

UNIT I LINEAR PROGRAMMING MODELS  9
Mathematical Formulation - Graphical Solution of linear programming models – Simplex method – Artificial variable Techniques- Variants of Simplex method

UNIT II TRANSPORTATION AND ASSIGNMENT MODELS  9

UNIT III INTEGER PROGRAMMING MODELS  9
Formulation – Gomory’s IPP method – Gomory’s mixed integer method – Branch and bound technique.

UNIT IV SCHEDULING BY PERT AND CPM  9

UNIT V QUEUEING MODELS  9
Characteristics of Queuing Models – Poisson Queues - (M / M / 1) : (FIFO / 8 /8), (M / M / 1) : (FIFO / N / 8), (M / M / C) : (FIFO / 8 / 8), (M / M / C) : (FIFO / N / 8) models.

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS015 ADHOC NETWORKS

OBJECTIVES

- To impart the trends in emerging field of wireless networking.
- To focus on layered communication modeling, such as the media access control and network layer.
- To address quality of service issues and network reliability for transmission of real-time information.

UNIT I FUNDAMENTALS


UNIT II ADHOC ROUTING PROTOCOLS


UNIT III MULTICAST ROUTING IN ADHOC NETWORKS


UNIT IV TRANSPORT LAYER-SECURITY PROTOCOLS


UNIT V QoS AND ENERGY MANAGEMENT


TOTAL: 45

TEXT BOOK


REFERENCES

BCS016  MOBILE AND PERVASIVE COMPUTING  L T P C
3 0 0 3

OBJECTIVES

• To learn the basics of wireless voice and data communications technologies.
• To gain fundamental knowledge on various telephone and satellite networks.
• To study the working principles of wireless LAN and its standards.

UNIT I  WIRELESS COMMUNICATION FUNDAMENTALS  9
Introduction to Wireless Transmission - Frequencies for radio transmission – Signals – Multiplexing –
Networks.

UNIT II  TELECOMMUNICATION NETWORKS AND WIRELESS LAN  9
Telecommunication systems – GSM – GPRS - Satellite Networks – Bandwidth Allocation - FAMA
and DAMA - Wireless LAN - IEEE 802.11 – Architecture – services – HIPERLAN - Blue Tooth.

UNIT III  NETWORK AND APPLICATION LAYER  9

UNIT IV  PERVASIVE COMPUTING ARCHITECTURE  9
Introduction to pervasive computing – Principles - Access devices - Smart identification - Embedded
control – Device Control - Device Connectivity - Protocols - Security and Device Management - Case
study on 3G devices.

UNIT V  PERVASIVE COMPUTING DEVICES AND TECHNOLOGY  9
Embedded languages - Palm OS – Windows CE - Symbian OS - J2ME enabled devices.

TOTAL: 45

TEXT BOOKS
2. Uwe Hansmann, Lother Merk, Martin S.Nicklous and Thomas Stober, “Pervasive

REFERENCES
1. Jochen Burkhardt, Dr.Horst Henn, Stefan Hepper, Klaus Rindtorff and Thomas Schaack,
“Pervasive Computing: Technology and Architecture of Mobile Internet Applications”, 6th
BCS017  SYSTEM ADMINISTRATION AND MANAGEMENT  L T P C  3 0 0 3

OBJECTIVES

• To know the ethics of network and system administration.
• To have an introductory knowledge about the emerging trends in the area of database administration and infrastructure design of systems.
• To recognize the problems and Maintain Secure Systems.
• To understand the Linux OS and its file system management.

UNIT I  SYSTEM ADMINISTRATION AND ETHICS  9

UNIT II  DATABASE ADMINISTRATION  9
Introduction of a Database - Special Considerations - The Evolution of the Database Administration Function - The Database Environment’s Human Component - Security -Database Administration Tools - Developing a Data Administration Strategy -The DBA at work (using Oracle).

UNIT III  SYSTEM INFRASTRUCTURE DESIGN  9
Assigning IP Addresses - Naming Network Devices - Installing Wireless NICs - Measuring Wireless Signal Strength -Implementing Bluetooth - Implementing Ad Hoc Wireless Networking - Using an Analog and DSL Modem - Using a Router as a Frame Relay Switch - Simulating T1 CSU/DSUs

UNIT IV  NETWORK ADMINISTRATION  9

UNIT V  LINUX SYSTEM MANAGEMENT  9

REFERENCES

BCS018  SERVICE ORIENTED ARCHITECTURE  L T P C
(Common to CSE & IT)  3 0 0 3

OBJECTIVES
- To gain understanding of the basic principles of service orientation.
- To learn service oriented analysis techniques.
- To learn technology underlying the service design.
- To know about various WS-* specification standards.

UNIT I  SOA FUNDAMENTALS  9

UNIT II  SOA AND WEB SERVICES  9

UNIT III  SOA ANALYSIS  9
Service oriented analysis - Business-centric SOA - Deriving business services - service modeling - Service Oriented Design - WSDL basics - SOAP basics - SOA composition guidelines - Entity centric business service design - Application service design - Task-centric business service design.

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  WS SPECIFICATION  9

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS019  STORAGE AREA NETWORKS  L T P C  3 0 0 3

OBJECTIVES
- To understand Storage Area Networks characteristics and components.
- To become familiar with the SAN vendors and their products.
- To learn the communication using fiber channel protocols.

UNIT I  INTRODUCTION TO STORAGE TECHNOLOGY  9

UNIT II  STORAGE AREA NETWORK TECHNOLOGIES  9

UNIT III  I/O TECHNIQUES  9
I/O path from CPU to Storage Systems – SCSI Technology – Fiber channel – IP Storage – Introduction to InfiniBand switches – NAS.

UNIT IV  STORAGE VIRTUALIZATION  9

UNIT V  MANAGEMENT OF STORAGE AREA NETWORKS  9

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS020  SYSTEM APPLICATION AND PRODUCTS  L T P C  3 0 0 3

OBJECTIVES
- To providing information about SAP architecture and frameworks.
- To understand Business Process Management, and up gradation.
- To study the features of SAP application servers.
- To develop the capability to solve all kind of business infrastructure.

UNIT I  INTRODUCTION  9
A Gateway to SAP - Architecture of SAP R/3 – SAP Integrated-Analysis, Implementation and Design  
- SAP Easy Access – SAP User Menu – SAP Settings – Role of User – Functions of a System  
  Administrator – SAP User Interface – SAP GUI – Handling Multiple SAP Sessions

UNIT II  BASICS OF SAP  9
Starting SAP System - Logging into SAP - The SAP logon - User Interface – SAP Shortcuts - Session  
Manager - Handling Tasks in SAP - Accessing Task in a System – Reports in SAP -Background  
Processing.

UNIT III  SYSTEM ADMINISTRATION  9
System Administration Utilities – Managing Update Records-Client Information in SAP – SAP  
System logs – Basic Tracing Utilities – SAP R/3 Basis System – Application servers – Components of  
Application Server.

UNIT IV  ABAP PROGRAMS  9
Structure of ABAP Programs-Container of Processing Blocks – Program Types and Execution  
- Processing Blocks in ABAP Programs – Data Types and Objects – Memory Structures of an ABAP  
program-Work Processors.

UNIT V  COMPONENTS OF ABAP  9
Subroutines – Running ABAP Programs – ABAP Database Access.

TOTAL: 45

TEXT BOOK

REFERENCES
2. Kogent Learning Solutions Inc, “SAP ABAP HandBook”, Jones and Bartlett Publishers,  
  2011.
BCS021 SOFTWARE QUALITY MANAGEMENT  L T P C
3 0 0 3

OBJECTIVES
- To study the concept of Software quality models.
- To learn about Quality plan, implementation and documentation.
- To analyze the need for Quality tools and CASE tools.
- To introduce few International quality standards – ISO, CMM, Six Sigma.

UNIT I INTRODUCTION TO SOFTWARE QUALITY 9

UNIT II SOFTWARE QUALITY ASSURANCE 9

UNIT III QUALITY CONTROL AND RELIABILITY 9

UNIT IV QUALITY MANAGEMENT SYSTEM 9

UNIT V QUALITY STANDARDS 9

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS022 MAINFRAME COMPUTING  L T P C
3 0 0 3

OBJECTIVES
- To learn the concepts of mainframe and its functionalities.
- To have a good knowledge in System Management and Automatic Computing.
- To have a keen idea in COBOL Programming Constructs.

UNIT I INTRODUCTION
9

UNIT II TSO/ISPF
9
TSO Commands – Job control language (JCL) - General syntax of JCL statements –JOB statements – EXEC statements –DD statements – Additional parameters on JOB, EXEC and DD statements – Utilities.

UNIT III VSAM
9

UNIT IV COBOL
9

UNIT V SYSTEM MANAGEMENT AND AUTONOMIC COMPUTING
9

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS023 CYBER FORENSICS AND ETHICAL HACKING L T P C
3 0 0 3

OBJECTIVES
- To learn the need for cyber forensics in criminal and civil investigations.
- To understand the types of computer crimes, cyber threats and digital evidence.
- To have a knowledge of Legal & ethical issues involved in conducting cyber forensic investigations.

UNIT I UNDERSTANDING CYBER FORENSICS 9

UNIT II ANALYSIS AND RECOVERY TECHNIQUES 9

UNIT III FORENSICS OF HAND-HELD DEVICES 9

UNIT IV INTRODUCTION TO ETHICAL HACKING 9

UNIT V ETHICAL HACKING TYPES 9

TOTAL: 45

TEXT BOOKS

REFERENCES
OBJECTIVES

- To create an awareness on Intellectual Property Rights (IPR)
- To understand patents and copyrights
- To know about application procedures of IPR

UNIT I TYPES OF PROPERTY

UNIT II PATENTS AND APPLICATION PROCEDURES

UNIT III INTERNATIONAL PARTICES

UNIT IV LEGISLATIONS AND POLICY

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

TOTAL: 45

TEXT BOOK

REFERENCES
BCS024     SOFT COMPUTING     L T P C
3 0 0 3

OBJECTIVES
• To impart deep knowledge of soft computing theories and fundamentals.
• To give an understanding on the fundamentals of Nontraditional Technologies and approaches to solving hard real-world problems.
• Fundamentals of Artificial Neural Networks, Fuzzy sets, Fuzzy logic and Genetic algorithms.
• To give an overview of genetic algorithms and machine learning techniques.
• To illustrate the use of ANN, Fuzzy sets to solve hard real-world problems.

UNIT I     INTRODUCTION

UNIT II    FUZZY SETS AND FUZZY LOGIC

UNIT III   FUZZY MEASURES AND REASONING
Fuzzy arithmetic and measures - Fuzzy rule base – Fuzzy Approximate reasoning - Categorical, qualitative, syllogistic, dispositional - Fuzzy inference systems - Fuzzy decision making - Fuzzy logic control systems: Architecture, model and application.

UNIT IV    MACHINE LEARNING AND GENETIC ALGORITHM

UNIT V     APPLICATIONS WITH CASE STUDY

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS025  GREEN COMPUTING  L  T  P  C
3  0  0  3

OBJECTIVES
- To learn about the importance of the green computing.
- To have a knowledge of the green computing approaches.
- To learn about the architecture of the Green Computing.
- Understanding the applications of green Computing in various domains.

UNIT I  OVERVIEW AND INITIATIVES
Overview – Issues: Toxin – Power consumption – Disposals –Power saving – Hardware saving -
Current initiatives – Global initiatives – Asia Standards – Consumption issues.

UNIT II  CONSUMPTION ISSUES
Minimizing power usage: Power problems – Monitoring power usage – Reducing power usage –
Low power computers and components – Cooling costs: Reducing cooling costs – Optimizing
airflow – Data center design.

UNIT III  GREEN COMPUTING PLATFORMS
Greening process – Datacenter design and redesign – Virtualization.

UNIT IV  GREEN COMPUTING ARCHITECTURE
Rethinking of behavior – paperless communication – Recycling.

UNIT V  GREEN COMPUTING MODELS
Hardware considerations – Case studies: Energy utilities – Universities – Technological Businesses
– Other Organizations.

TOTAL: 45

TEXT BOOKS
1. Toby J.Velte, Anthony T.Velte and Robert Elsenpeter, “Green IT Reduce your Information
    System’s Environmental impact while Adding to the Bottom Line”, Tata McGraw-Hill,
    2008.
2. John Lamb, “The Greening of IT: How Companies can make a Difference for the

REFERENCE
1. Jason Harris, “ Green Computing and Green IT Best Practices on Regulations and Industry
   Initiatives, Virtualization, Power Management, Materials Recycling and Telecommuting”,
BCS026 KNOWLEDGE BASED DECISION SUPPORT SYSTEM  L  T  P  C
3  0  0  3

OBJECTIVES

- To understand decision support system features.
- To learn the task of managing knowledge.
- To apply Artificial Intelligence in Knowledge Based Decision Support System development.
- To familiarize Management Support System.

UNIT I INTRODUCTION
Decision making and computerized support: management support systems - Decision making systems modeling - Support.

UNIT II DECISION SUPPORT SYSTEM DEVELOPMENT
Decision making Systems - Modeling and analysis - Business intelligence - Data warehousing, Data acquisition - Data mining - Business analysis – Visualization - Decision support system development.

UNIT III KNOWLEDGE MANAGEMENT
Collaboration – Communication - Enterprise decision support system - Knowledge management - Collaborative computing technologies - Enterprise information system - Group support systems.

UNIT IV INTELLIGENT SYSTEM DEVELOPMENT
Intelligent support systems - AI and Expert systems - Knowledge based systems - Knowledge acquisition – Validation – Representation - Advanced intelligence system - Intelligent software agents.

UNIT V MANAGEMENT SUPPORT SYSTEMS

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS027 NATURE AND BIO INSPIRED COMPUTING
(Common to CSE & IT) 3 0 0 3

OBJECTIVES
- To acquire in-depth knowledge about the Nature and Bio inspired Computing.
- To introduce the students to biologically inspired computing.
- To uncover the state-of-the-art of present technology.
- To survey relevant theoretical models, reconfigurable architectures and computational intelligence techniques.

UNIT I INTRODUCTION 9

UNIT II ANT COLONY OPTIMIZATION 9

UNIT III APPLICATIONS 9

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.

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS028  NATURAL LANGUAGE PROCESSING  L  T  P  C  
3  0  0  3

OBJECTIVES
- To introduce language processing and morphological parsing
- To understand the rule-based part-of-speech tagging
- To know the features and unifications of structures
- To know the syntactic and semantic meanings with applications

UNIT I  INTRODUCTION  6

UNIT II  SYNTAX  10

UNIT III  FEATURES AND UNIFICATION  10

UNIT IV  SEMANTIC MEANINGS  11

UNIT V  APPLICATIONS  8

TOTAL: 45

TEXT BOOK

REFERENCES
BCS029 COMPUTER SIMULATION AND MODELING L T P C
3 0 0 3

OBJECTIVES

- To explore the methods for modeling of systems using event simulation.
- To emphasis on modeling and on the use of simulation software.
- To formulate simulation model for a given problem, implement the model in software and perform simulation analysis of the system.

UNIT I INTRODUCTION TO SIMULATION 9
Introduction - Simulation terminologies - Application areas - Model classification - Types of Simulation - Steps in a simulation study - Concepts in discrete event simulation - Simulation examples.

UNIT II MATHEMATICAL MODELS 9

UNIT III ANALYSIS OF SIMULATION DATA 9

UNIT IV VERIFICATION AND VALIDATION 9
Model Building - Verification of Simulation Models - Calibration and validation of models - Validation of model assumptions - Validating input - Output transformations.

UNIT V SIMULATION OF COMPUTER SYSTEMS 9
Simulation tools - Model input - High level computer system simulation – CPU simulation - Memory simulation - Comparison of system designs. Case Study: Simulation of Computer Networks.

TOTAL: 45

TEXT BOOKS

REFERENCES
BCS030 DATA COMMUNICATION AND COMPUTER NETWORKS L T P C
3 0 0 3

OBJECTIVES
- To study the concepts of data communications and network architecture.
- To understand the network classifications and design principles.
- To learn about various multiple access techniques used in networking.
- To study about the switching concepts and routing protocols.
- To learn about the various protocols.

UNIT I DATA COMMUNICATIONS 9
Data communications and networking overview - Data transmission - Guided and wireless transmission - Signal encoding - Multiplexing - Spread spectrum.

UNIT II NETWORK FUNDAMENTALS 9

UNIT III DATA LINK LAYER 9
Link level error control - Checksum - CRC - Flow control mechanisms - Stop and wait ARQ - Go-Back N ARQ - Selective repeat ARQ.

UNIT IV NETWORK LAYER 9
Routing - Distance Vector Routing - Link State Routing - Inter-domain routing - BGP - IP - ARP - RARP - ICMP - IGMP.

UNIT V TRANSPORT AND APPLICATION LAYER 9
TCP - UDP - DNS - Telnet - Rlogin - FTP - SMTP - WWW - HTTP - SNMP.

TOTAL: 45

TEXT BOOKS

REFERENCES