B.Tech (Computer science and Engineering) Ist Year
Effective from 1999-2000.

COURSE STRUCTURE

Subject Code	Subject	T	P	C
CS1001	English	3	-	6
CS1002	Mathematics – I	3+1*	-	6
CS1003	Applied Physics	2+1*	-	6
CS1004	Computers and Information Technology	3	-	6
CS1005	C & Data Structures	3	-	6
CS1006	Network Theory	3	-	6
CS1007	Semiconductor Devices and circuits	3	-	6
CS1008	Engineering Drawing Practice	-	3	4
CS1009	Computer Programming Lab	-	6	8
CS1010	Semiconductor Devices and Circuits Lab	-	3	4
		20+2*	12	56

* Tutorial.

CS1001 ENGLISH

(Common for all Branches)

UNIT-I

From A Text book of English for Engineers and Technologists (O.L)

1. Energy, Unit 3: Alternative sources
2. Computers, Unit 2: New Frontiers.

UNIT-II

From A text book of English for Engineers and Technologists (O.L.)

1. Technology Unit 3: Evaluating Technology
2. Environment, Unit 2: Pollution.

UNIT-III

From A text book of English for Engineers and Technologists (O.L).

1. Industry, unit 2: Safety and training.

From masterminds (O.L)

2. The trailblazers.

UNIT-IV

From Masterminds (O.L)

1. The word of figures and Physics 2. The Institution of Builders.

UNIT-V

From Masterminds (O.L)

1. The new age 2. The Living world.

UNIT-VI

Correction of sentences, sentence completion, Analogy, Report writing, Flowcharts and Pie Charts, General Essay, Comprehension, Sounds of English, Accent and Intonation.

BOOKS RECOMMENDED:

1. Strengthen your writing by V. R. Narayana Swamy (O.L).
2. Success with grammar and composition by K. R. Narayanaswamy (O.L).
3. Examine your English by Margaret M. Maison (O.L).
4. English for Professional Students by S. S. Prabhakara Rao
5. TOEFL (ARCO & BARRONS, USA).
6. GRE (AARCO & BARRONS, USA).

CS1002 MATHEMATICS - I

(Common for all Branches).

UNIT – I

Sequences – Series – Convergence and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Rabe's test – Absolute and conditional convergence.

UNIT – II

Rolle's theorem – Mean value theorem – Lagrange's and Cauchy's form with remainders – Radius, Centre and Circle of curvatures – Evolutes and envelopes.

UNIT – III

Functions of several variables – Partial differentiation – chain rule – Euler's theorem – Jacobian – Functional dependence – Taylor's theorem - Maxima and Minima of functions of two variables with and without constraints. Curve tracing – Cartesian, Parametric and Polar coordinates.

UNIT – IV

Application of integration to lengths, volumes and surface areas – Cartesian and Polar coordinates – Double and triple integrals, change of variables – changing the order of integration – differential equations of first order and first degree – Exact, Linear and Bernoulli equation.

Applications to Geometry, Law of natural growth and Newton's Law of Cooling.

UNIT – V

Linear differential equations of second and higher order with constant coeffients – Homogenous simultaneous equations – Method of variation of parameters.

Laplace transform of standard functions – Inverse transforms – convolution theorem without proof – Transforms of periodic functions – L.T. of derivative and integrals – Applications of L.T. to ordinary differential equations.

UNIT – VI

Gradients, divergence, curl and their related properties, Line, surface, volume integrals – potential function – workdone as line integral – curvilinear coordinates – cylindrical and spherical coordinates – Expressions of Grad, Div, Curl, Spherical, Cylindrical and Polar coordinates – Green's stokes and divergence theorems (with proofs) and some simple problems.

TEXT BOOKS:

1. Advanced Engineering Mathematics – by Kreyszig. E
2. Higher Engineering Mathematics – by B. S. Grewal.
3. Engineering Mathematics – by Lazpathroy.

CS1003 APPLIED PHYSICS
(Common for EEE, ECE, EIE, EcontE, CSE, CSIT & BME)

UNIT-I

Chapter 1: Free electron gas model; free electron gas in one dimensional box; energy levels and density of states; Thermionic emission; Schottky emission; Field emission; and photo electric emission; Hall effect.

Chapter 2: Periodic lattice and Bloch's theorem; Kronig Penny model; velocity – effective mass; distinction between metals, insulators and semiconductors; Density of states.

UNIT – II

Chapter 3: Dieelectrics; Local field; Clausius – Mossoti equation; sources of polarizability (dipolar, iornic & electronic) frequency dependence; total polarizability; measurement of dielectric constant; piezoelectricity; ferroelectricity.

Chapter 4: Magnetic materials: diamagnetism; classical theory – quantum theory (Qualitative); paramagnetism; classical theory – Quantum theory (Qualitative); cooling by adiabatic demagnetization; ferromagnetism; Weiss theory; Hysteresis; domains; Bloch wall; antiferromagnetism – molecular field theory; ferromagnetism – molecular field theory; ferrimagnetism – molecular field theory.

UNIT – III

Chapter 5: Fermi – Dirac statistics; electron and hold densities; overall perspective; intrinsic semiconductors; charge neutrality; recombination; Schockley, Read and hall Theory; surface recombination and emission.

Chapter 6: Semiconductors; nonequilibrium; continuity equation ; carrier scattering and mobility; drift current and conductivity; diffusion currents and Einstein's relations; Quasi Fermi level; Band diagram in equilibrium and non-equilibrium.

Chapter 7: Thermistors and piezo resistors, phosphorescence and fluorescence; Gunn effect, Hall effect, and Thermoelectric effect.

UNIT-IV

Chapter 8: Radiative transitions – LEDs; semiconductor laser and its characteristics.

UNIT-V

Chapter 9: Photoconductors; photodiodes; avalanche photodiode; phototransistor.

Chapter 10: Solar radiation and conversion efficiency; PN junction; solar cells – Heterojunction, interface, and thin film solar cells.

UNIT –VI

Chapter 11: Super conductivity; experimental facts and theoretical explanations.

Chapter 12: IC fabrication – planar processes – Fabrication of BJT, FET & CMOS devices – monolithic diodes – contacts – IC resistors and capacitors – IC packaging – Characteristics of IC components.

TEXT BOOKS:

1. Solid state physics by R.L. Singhal, Kedarnath Ramnath & Co., Meerut (for chapter 1 to 4 & 11).
2. Semiconductor Devices by D.Nagchaudhari, TMH Publications, (for chapter 5,6,& 7)
3. Physics of semiconductor devices, by S.M. Sze, Wiley Eastern (for chapter 8,9,10).
4. Micro electronics by millman & Grabel (for chapter 12).

REFERENCE BOOKS:

1. Solid state physics, by Charles Kittel, 7^{th} edition.
2. Solid state physics by A. J. Dekker
3. Physics of semiconductor Devices by M. Shur, PHI Publication.
4. Physics of semiconductor devices, by D. K. Roy, Orient Longman.
5. Introduction to solids – Azaroff, TMH Edition.

CS1004 COMPUTERS AND INFORMATION TECHNOLOGY
(Common for ECE,EEE,EIE, E Cont E, BME, CSE & CSIT)

UNIT – I (Qualitative Treatment Only)
Computers, capabilities, types of computers, application areas, computer anatomy, functional block diagram, central processing unit, functions of ALU and control unit in CPU, purpose of registers in CPU, microprocessors, CISC/RISC processors, memory functions, address, word, RAM, ROM, Cache memory, associate memory, magnetic disk, tape, floppy, optical disk, address bus, data bus, control bus, functions of I_O Devices, keyboard, mouse, light pen, dot-matrix printer, line printer, laser printer, ink-jet printer, CRT Monitor, color monitor, CGA, Screen resolution, flat panel display unit, machine language, assembler, high-level language, compiler, operating system, types of operating systems, number systems, binary, Hex, Octal, BCD code, character codes, 3 methods of binary representation of integers, floating point numbers.

UNIT – II (Qualitative treatment Only)
Internet and World Wide Web, information technology today, word processing and desk top publishing, spread-sheet and data base applications, communications –electronic web.

UNIT-III (Qualitative treatment onlY)
Multimedia, IT in business, programming and systems development, personal, social and ethical issues.

UNIT-IV Numerical Methods – I
Iterative methods, bisection, false position, Newton-Raphson, successive approximation method, algorithms comparison of iterative methods, solution of linear simultaneous algebraic equations, Gauss Jordan and Gauss Siedal's methods, algorithms.

UNIT –V Numerical Method –II
Interpolation, Lagrange interpolation, forward difference, backward difference and central difference interpolation methods, algorithms, errors in interpolation, least square approximation of functions, linear regression, polynomial regression, algorithms.

UNIT –VI Numerical Methods – III
Numerical integration by Trapezoidal and Simpson's rules, algorithms, Numerical solution of differential equations, Euler method, Runge-Kutta fourth order method, Milne predictor corrector method, algorithms, comparison of Runge-Kutta and Predictor-Corrector methods.

BOOKS:

1. "Computers and Commemsense" by Shelly and Junt, 4th edition, Prentice Hall of India.
2. "Computer Oriented Numerical Methods" by V. Rajaraman.
3. "Information Technology" by Deniis P. curtin, KIMfolly, Kvnal Sen, Cathleen Morin, Tata MC Graw-Hill Companies.
4. "Numerical methods" by E. Balaguruswamy.
5. "Introduction to Computers" by Peter Norton.

CS1005 C AND DATA STRUCTURES
(Common for ECE,EEE,EIE, E Cont E, BME, CSE & CSIT)

UNIT – I

Algorithm, flowchart, program development steps, basic structures of C language, C tokens, data types, declaration of variables, assigning values, arithmetic, relational and logical operator, increment and decrement operators, control operator, bit-wise operator, expressions, evaluation, input-output operators, IF and SWITCH statement, WHILE, DO-WHILE and FOR statements, C programs covering all the above aspects.

UNIT-II

One dimensional & Two dimensional arrays, initialisation, string variables, declaration, reading, writing, string handle function, user-defined functions variables & storage classes, example C Programs.

UNIT-III

Structure definition, initialising, assigning values, passing of structures as arguments, unions, declaring & initialising of pointers, pointer based expressions, arrays, strings, functions and structures, C Program examples, file management in C, opening & Closing, I-O operations on files.

UNIT-IV

Stacks, represnting stacks in C, Infix, Postfix & Prefix programs, recursion in C, Queue & its sequential representation, circular queue, sequence.

UNIT-V

Single Linked List, Double linked list, Header, Circular List, applications, binary trees, representation, tree traversals, graph representaltion, graph traversals, spanning trees.

UNIT - VI

Search techniques: linear and binary search methods, sorting methods, Exchange sort, selection sort, quick sort, tree sort.

Reference Books:

1. " Programming in ANSI C" by E. Balaguru Swamy.
2. " Data Structures using C" by A.M. Tanenbaum and Others.
3. "The C Programming Language" by Kerninghan and Others.
4. "An introduction to data structures with applications: by Trembly and Sorenson.
5. "Fundamentals of Data structures" by Horowitz and Sahani.

CS1006 NETWORK THEORY
(Common for ECE,EEE,EIE, E Cont E, BME, CSE & CSIT)

UNIT-I

Circuit – Concept – R-L-C parameters – concept of mutual inductance – dot convention – coefficient of coupling – voltage and current sources – source transformatlion – specifications of Active and Passive elements – voltage – current relationship for passive elements – Kirchoff's Laws – Response of R-L, R-C, R-L-C (Series and parallel combinations) for impulse, step, ramp excitations. Magnetic Circuits – Analysis of series and parallel magnetic circuits.

UNIT – II

RMS and average values and form factor of different periodic wave forms, steady state analysis of R,L and C (in series, parallel and series parallel combinations) with sinusoidal excitation – concept of reactance, impedance, susceptance and Admittance – Phase and Phase difference – concept of power factor, Real and Reactive powers – j-notation, complex and polar forms of representaltion, complex power-series and parallel resonance – bandwidth – selectivity – Q factor – current locus diagrams.

UNIT – III

Three phase circuits; phase sequence – star and delta connection – Relation between line and phase voltages and currents in balanced systems – Analysis of balanced and unbalanced 3 phase circuits – star/delta transformation – Network topology – definitions – graph – tree, basic cutset and basic tie set matrices for planar network – Loop and Nodal methods of analysis of networks (including coupled circuits), duality and dual networks.

UNIT – IV

Network theorems: (without proof): Tellegen's, superposition, reciprocity, Thevinin's, Norton's, Maximum power transfer, Millman's and compensation theorems. Application to steady state analysis – network functions – Driving poing and transfer functions – poles and Zeros one port and two port networks 0 two port network parameters – Z, Y Transmission and Hybrid parameters and their relationships.

UNIT-V

Transient response of R-L, R-C, R-L-C circuits (Series and parallel combinations) for D.C and sinusoidal excitations – initial conditions – time domain and Laplace transform methods of soultions.

UNIT-VI

Filters – Low pass – High pass and Band pass – RC, RL filters – constant K and m-derived filters and composite filter design – Attenuates – Principle of equalizers – Series and Shunt equalizers – L type, T type and Bridged – T and Lattice Equalizers.

SPICE for circuit analysis – Description of circuit elements, nodes and sources, input and Output variables – modeling of the above elements – types of DC analysis.

TEXT BOOKS:

1. Network Analysis – M.E. Van Valkenberg, Prentice-Hall of Idnia Pvt. Ltd., 3rd edition, 1998.

2. Engineering circuit analysis – By William Hayt and jack E.Kemmerly,c Graw-Hill Companies, 5th edition.

3. Electric circuits – J. Edminister & M. Nahvi – Schaum's outlines Tata Mc Graw-Hill Publishing company Ltd., 1999.

3. Spice for circuits & Electronics using Pspice – by Mohd. H. Rashid, Prentice-Hall of India, 2nd edition.

REFERENCE BOOKS:

1. Networks and Systems – D.Roy Choudhury, New Age International Limited, Publishers, 1998.

2. Network Analysis – G. K. Mithal

3. Electric Circuit Analysis – S. R. Paranjothi, new Age International Limited, Publishers, 1998.

4. Networks, Lines & Filters – by John. D. Ryder, Prentice-Hall of India Publications.

CS1007 SEMICONDUCTOR DEVICES AND CIRCUITS
(Common for ECE,EEE,EIE,E Cont E, BME, CSE & CSIT)

UNIT – I

Electronic Dynamics and CRO

Motion of charged particles in electric and magnetic fields, simple problems involving like electric and magnetic field only. Electrostatic and magnetic focussing. Principles of CRT, Deflection sensitivity (Electrostatic and Magnetic deflection). Applications of CRO; voltage, current and frequency measurements.

UNIT II

Semi Conductor Diodes and Rectifiers:

Construction, principle of operation, V-I Characteristics, symbol, equivalent circuit, parameter calculation, applications, limitations and specifications of pn junction diode, Zener diode, varactor diode, Tunnel diode, and photo diode. Diffusion and transition capacitance of pn junction doide.

UNIT III

Transistor Characteristics:

Construction, principle of operation, V-I characteristics, symbol, equivalent circuit, parameter calculations, applications, limitations and specification of BJT, FET, UJT and MOSFET'S (Different configurations of transistors are to be considered). Specifications of BJT, FET, UJT and MOSFET'S.

UNIT-IV

Amplifiers:

Biasing, DC equivalent model, criteria for fixing operating point and methods of bias stabilization, thermal runaway and thermal stability. Small signal low-frequency transistor amplifier circuits; -Parameter representation of a transistor, Analysis of single stage transistor amplifier using –parameters; voltage gain, current gain, input impedance and output impedance comparison of BJT and FET RC-coupled amplifier-frequency response, cascaded amplifiers (all configurations of BJT and FET are to be considered). High frequency model of transistor, O, and cut-off frequencies of transistor. Single stage and multistage amplifiers. Calculation of band width of single and multistage amplifiers. Concepts of gain band width product. Specifications of amplifiers.

UNIT –V
Feedback amplifiers and oscillators:

Concept of feedback. Classification of feedback amplifiers, general characteristics of negative feed back amplifiers, effect of feedback on amplifiers characteristics, single problems.

Condition of oscillations, RC and LC type oscillators, crystal oscillators, frequency and amplitude stability of oscillations. Generalised analysis of LC oscillators, quartze (Hartley, Colpitts) RC phase-shift and Wein-bridge oscillators.

UNIT –VI

Power amplifiers and turned amplifiers:

Classification of power amplifiers, Class A,B, AB and C power amplifiers, push-pull and complementary push-pull amplifiers. Design of heat sinks, power output, efficiency, cross-over distortion and harmonic distortion. Specifications of power amplifiers. Single tuned and double tuned voltage amplifiers. Interstage design, stability considerations, class B and class C tuned Power amplifiers and specifications.

REFERENCES:

1. Nash elsky and Boy Sted, electronic devices and circuit, PHI.

2. Millman and Halkias, Electronic devices and circuits, ISE.

3. Y.N. Bapat, electronic devices and circuits –Discrete and integrates, TMH.

4. Millman and Grabel, Microelectronics, McH.

5. Bogart: Electronic devices and circuits (Universal book stall, New Delhi).

CS1008 ENGINEERING DRAWING PRACTICE

(Common for ECE, EEE,EIE, E Cont E, BME, CSE & CSIT)

UNIT – I:

Introduction to Engineering Graphics – Construction of : Ellipse, Parabola and Hyperbola, Cycloidal Curves.

UNIT – II:

Orthographic Projections of Points, Lines, and Planes – Axis inclined to one plane and inclined to both the planes.

UNIT – III:

Orthographic Projections of Solids: Cylinder, Cone, Prism, Pyramid and Sphere in simple positions and axis inclined to botht he planes.

UNIT-IV:

Development of surfaces : Prism, cylinder, pyramid and cone.

UNIT-V:

Isometric Projections of Lines, Planes and Simple Solids.

UNIT-VI:

Conversion of Orthographic views into Isometric Views and Vice-Versa.

TEXT BOOKS:

1. Engineering Graphics – by K. L. Narayana & P. Kannayya, Scietech publishers.

2. Engineering Drawing – by N. D. Bhat, Charotar Publishers.

3. Engineering Drawing and Graphics – by Venugopal, New Age International Limited, Publishers.

CS1009 COMPUTER PROGRAMMING LAB
(Common for ECE,EEE,EIE,E Cont E, BME, CSE & CSIT).

1. Write a C program that evaluates the following algebraic expressions after reading necessary values from the user:

a. ax+b/ax-b.
b. $2.5 \log x + \cos 32^0 + |x^2-y^2| + \sqrt{2xy}$
c. $x^5+10x^4+8x^3+4x+2$
d. (4x+3) (3y+2z-4)
e. $a\, e^{-kt}$
f. $1/\alpha\sqrt{2\pi}\, e-(x-m/\sqrt{2\sigma})^2$

2. Write a C program that prints the given 3 integers in ascending order using if-else.

3. Using WHILE statement write a C program to find the sum of 1+2+3+4+…n.

4. Repeat problem (3) using do-while statement.

5. Write C program using FOR statement to find the following from a given set of 20 integers.

i) Total number of even integers.
ii) Total number of odd integers.
iii) Sum of all even integers.
iv) Sum of all odd integers.

6. Write C program to evaluate the following series. Assume suitable vazlue of x.

Y= 1+x2/2!+x2/4!+x6/6!+upto 10 terms.

7. Write a C program to obtain the product of two matrices A of size (3X3) and B of size (3X2). The resultant matrix C is to be printed out along with A and B. Assume suitable values for A & B.

8. Using switch-case statement, write a C program that takes two operands and one operator from the user, performs the operation and then prints the answer. (consider operators +,-,/,* and %).

9. Write in C a function to evaluate Sinx using the series x+x3/3!+x5/5!+….upto 7^{th} digit Accuracy. Also write the main program that uses this function.

10. Write C procedures to add, subtract, multiply and divide two complex numbers (x+iy) and (a+ib). Also write the main program that uses these procedures.

11. The total distance travelled by vehicle in 't' seconds is given by distance = $ut+1/2at^2$ where 'u'and 'a' are the initial velocity (m/sec.) and acceleration (m/sec^2). Write C program to find the distance travelled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

12. Write C program that will read the value of x and evaluate the following function.

y = {1 for x>0
{0 for x = 0
{-1 for x < 0
using (i) if statements (ii) else if statements, and (iii) conditional operator.

13. A cloth show room has announced the following seasonal discounts on purchase of items.

Purchase Amount	Discount (Percentage)	
	Mill Cloth	Handloom items
1-100	-	5.0
101-200	5.0	7.5
201-300	7.5	10.0
Above 300	10.0	15.0

Write a C program using switch and If statements to complete the net amount to be paid by a customer.

14. Given a number, write C program using while loop to reverse the digits of the number. Example 1234 to be written as 4321.

15. The fibonacci sequence of numbers is 1,1,2,3,5,8… based on the recurrence relation

f(n) = f (n-1) + f (n-2) for n>2.
Write C program using d0-while to calculate and print the first m fibonacci numbers.

16. Write C programs to print the following outputs using for loop.

```
1                          1
2  2                     2    2
3  3  3                3   3   3
4  4  4  4             4   4   4   4
5  5  5  5  5          5   5   5   5   5
```

17. Write a C program to find the product of two matrices.

18. Write a C program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted starting with the nth character.

19. A Maruthi Car dealer maintains a record of sales of various vehicles in the following form:

Vehicle type	**Month of Sales**	**Price (Rs).**
Maruthi – 800	02/87	75,000
Maruthi – DX	07/87	95,000
Gypsy	04/88	1,10,000
Maruthi Van	08/88	85,000

Write a C program to read this data into a table of strings and output the details of a particular vehicle sold during a specified period. The program should request the user to input the vehicle type and the period (Starting month & ending month).

20. Write a function that will scan a character string passed as an argument and covert all lower case characters into their upper case equivalents.

21. Implement the following data structures using Arrays
    i) Stacks ii) Linear Queues iii) Circular queues iv) Dequeue.

22. Implement polynomial addition and multiplication with linked list sparse matrix.

23. Implement binary search tree using linked list and perform the following operations.
    i) Insertion ii) Deletion iii) Inorder Traversal iv) Preorder Traversal
    v) Post Order Traversal.

24. Singly linked list and doubly linked lists
    i) Insertion ii) Deletion iii) Lookup

25. i) Implement stack using singly linked list.
    ii) Implement queue using singly linked list.

26. Implement the following sorting techniques.
    i) Bubble sort ii) Insertion Sort iii) Quick Sort iv) Heap Sort.

27. Implement the following searching method.
    i) Sequential Search ii) Binary Search iii) Fibonacci

28. i) Conversion of Infix expression to Postfix notation.
    ii) Simple expression evaluator, that can handle +,-,/ and *.

29. Implement the algorithms for the following iterative methods using C to find one root of the equation

    f9x)=x sinx + Cosx=0.

    a) Bisection b) False Position c) Newton-Raphson
    d) Successive approximation.

30. Write programs for implementing Gauss-Jordan and Gauss-Seidal methods for solving simultaneous algebraic equations given below.
    $9x_1+2x_2+4x_3 = 20$
    $x_1+10x_2+4x_3 = 6$
    $2x_1-4x_2+10x_3 = -15$.

31. Write Computer programs to implement the Lagrange interpolation and Newton-Gregory forward interpolation.

32. Implement in 'C' the linear regression and polynomial regression algorithms.

33. Implement Traezoidal and Simpson methods.

34. Implement Runge-Kutta 4^{th} order method and Milne Predictor-Corrector method.

35. Practice Microsoft word and prepare a formatted document which contains various fonds, a table etc.,

36. Practice the creation and use of spreadsheets and prepare a spread sheet application.

37. Create a database Table and Implement Querying.

CS1010 SEMICONDUCTOR DEVICES AND CIRCUITS LAB
(Common for ECE,EEE,EIE, E Cont. E, B.M.E.).

1. PN Junction diode characteristics a) Forward Bias b) Reverse Bias.
2. Zener diode Characteristics.
3. Transistor CB Characteristics (Input and Output)
4. Transistor CE characteristics (Input and Output)
5. Transistor CC characteristics (Input and Output).
6. Rectifier without filters (Full wave & Half wave)
7. Rectifier with filters (Full wave and Half wave).
8. UJT Characteristics
9. FET Characteristics
10. Study of CRO
11. Regulated Power supplies.
12. Measurement of h parameters of transistor in CB,CE,CC configurations.
13. CE amplifier
14. CC amplifier (emitter follower).
15. RC coupled amplifier (Two stage).
16. FET amplifier.
17. Class A amplifier.
18. Class B Amplifier
19. RC Phase shift Oscillator
20. Colpitts Oscillator
21. Tuned Voltage Amplifier
22. Class – C Tuned Power Amplifier
23. Verification of Miller Theorem.

B. Tech (CSE) II Year – I Semester
Effective from 1999-2000.

COURSE STRUCTURE

CS2101	Mathematics – II
CS2102	Discrete Structures and Graph Theory
CS2103	Data Processing and File Organization.
CS2104	Linear and Digital ICs Applications.
CS2105	switching theory and Logic design.
CS2106	Managerial Economics and Accountancy
CS2107	COBOL Lab
CS2108	IC Applications Lab.

CS2101 MATHEMATICS – II
(Common to all Branches)

UNIT-I

Matrices: Types of Matrices, Inverse – Elementary row transformations – Rank – Solution of a system of linear equations – homogenous and non homogenous equations.

UNIT-II

Eigen values – Eigen Vectors – Cayley hamilton theorem – its applications – quadratic forms – Canonical forms – Diagonalisation – properties of Eigen Values of orthogonal, hermitic, scewhermitian and unitary matrices.

UNIT-III

Periodic functions – Even and Odd functions – Fourier series – change of interval half rang expansion.

UNIT-IV

Formation of Partial differential equations by eliminating arbitrary constraints and functions – solutions of first order equations – solutions of Heat equation, Wave equation (one dimension only) and Laplace's equation by method of separation of variables.

UNIT –V

Fourier integral theorem – Finite and infinite Fourier transforms – Inverse transforms – Application to Boundary Value problems – Z-Transforms, Inverse Z-Transforms.

TEXT BOOKS:

1. Advanced Engineering Mathematics – by Kreyazig. E
2. Higher Engineering Mathematics – by B. S. Grewal.
3. Engineering Mathematics – by Lazpath Roy.

CS2102 DISCRETE STRUCTURES AND GRAPH THEORY

UNIT-I
Mathematical Logic:

Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, predicates, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theory Proving.

UNIT II
Set Theory

Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram, Functions, Inverse functions, Composition of functions, Recursive functions, Lattice and its properties.

UNIT III
Graph Theory I:

(Elementary treatment only) Definition, Representation, path Matrix Warshalls.

Algorithm, MINIMA Algorithm, Isomorphism, sub graphs, connected components, cyclic graph, Bipartite graph, Planar graph, Euler's formula, Euler circuit, De Bruijn sequence, Hamiltonian Graph, Chromatic number, cutset, tie etc.

UNIT IV
Graph Theory II:

Trees, Spanning tree of a Graph, Breadth – First & Depth – First Spanning trees, Binary Tree, Conversion of a tree, to binary tree. Tree traversals, Representation of Expressions by Binary tree, Forest, Binary search trees.

UNIT V:
Combinatorics & Recurrence Relations:

Disjunctive & Sequential counting, Combinations & Permutations, Enumeration without repetition Recurrence relation, Fibonacci relation, solving recurrence relation by substitution, solving non-linear recurrence relation by conversion to linear recurrence relation.

TEXT BOOKS:

1. Discrete Mathematical Structures with applications to computer science Trembly J.P. & Manohar .P

2. Discrete Maths for Computer Scientists & Mathematicians (Chapter 2,5,7) Prentice Hall, 1986 J.L. Mott, A. Kandel, T.P. Baker.

CS2103 DATA PROCESSING AND FILE ORGANIZATION

UNIT I

Structural Organization of COBOL:

Character set, words, sentences, identification Division, Environment division, data division, Data types – Numeric Alphabetic & Alphanumeric input-Output sections, working storage sections, PROCEDURE Division FEATURES: ACCEPT, DISPLAY, MOVE, Arithmetic & COMPUTE Verbs, sample programs, PERFORM & GOTO verbs, STRING, UNSTRING, INSPECT & COPY VERBS, Sample programs using PERFORM, Miscellaneous COBOL Statements.

UNIT II

CONDITIONAL STATEMENTS & TABLE HANDLING:

Relation conditions, Nested conditions, class conditions, condition-name conditions, Structured programming forms of program structure, structural flow charts, Subscripting, OCCURS clause, multidimensional, tables, Table Handling with PERFORM Verb.

UNIT III

BUSINESS FILES:

Operation on files, Master files, Transaction file, Report file, Batch processing, On-line Processing, case studies.

SEQUENTIAL ACCESS FILES:

Principles of magnetic storage & Accessing, Blocking, Inter record gap, Label records, COBOL Language instructions for sequential files.

UNIT IV

DIRECT ACCESS FILES:

Characteristics of disk storage & timing index, indexed sequential files, COBOL instructions for indexed sequential files, Relative file organization, Division-Reminder method, digital-analysis method, COBOL instructions for handling relative files.

UNIT V

SORTING, SEARCHING & MERGING:

Linear search sort, Merging sort, chained record sort, Linear search, Binary search, File sorting & Merging using sequential files.

REPORT GENERATION:

Output layout design, Heading, Date & Detailed summaries Control breaks, Language specifications for COBOL report writing.

TEXT BOOKS:

1. Information systems through COBOL, McGraw-Hill, 1978-Andreas S. Philiphakis: Leenard J. Kazmier.

2. COBOL Programming – M. K. Roy, D. Ghosh Dastidar.

CS2104 LINEAR & DIGITAL IC APPLICATIONS
(Common for ECE,EIE,E.Cont.E, Mechatronics, CSE & CSIT)

UNIT –I
OPERATIONAL AMPLIFIERS:

Design aspects of Monolithic Opamps, ideal characteristics, specifications offset voltages & currents, frequency compensation techniques, measurements of opamps parameters, application of Opamps, inverting, non-inverting amplifiers, integrators, function generators, logarithmic amplifiers, instrumentation amplifiers, signal conditioning circuits, multivibratorsl, square wave generator, rectifiers, peak detectors and voltage regulators.

UNIT – II

555 Timer, 556 function generator, IC's & their applications, terminal regulators IC 1496 (Balance modulator) IC565 phase locked loops & their typical applications, IC1496 (Balanced modulator) applications.

UNIT-III
ACTIVE FILTERS:

LPF, HPF, BPF, BEF, ALL Pass filters, and higher order filters and design, VCSV and IGMF configurations.

UNIT-IV
LOGIC FAMILIES:

DTL,TTL,ECL,IIL,MOS Logic families, parameters and their comparison, try state logic, interfacing of Logic Families, Flip-Flops.

UNIT-V:

Analog multiplexers, sample and hold circuits, D/A converters – resistive divider and ladder Networks, A/D converters, counters – ramp type, dual slope, integration technique, successive approximation, parallel comparison technique.

REFERENCE BOOKS:

1. Micro Electronics – Jacob Millman (ISE)

2. Opamps & Linear integrated circuits – Ramakanth Gayakwad (PHI)

3. Integrated Circuits – Borkar (Khanna)

4. Applications of linear integrated circuits – Clayton.

C2105 SWITCHING THEORY AND LOGIC DESIGN
(Common for ECE,EEE,EIE, E.Cont.E,CSE,CSIT)

UNIT-I

NUMBERS SYSTEMS AND CODES:

Review of number systems – binary arithmetic – binary weighted and non weighted codes – error detecting and error correcting codes.

BOOLEAN ALGEBRA:

Postulates and theorems, representation of switching functions – SOP & POS forms – Karnaugh and representation – minimisaiton using K-map.

UNIT – II

DESIGN OF COMBINATIONAL CIRCUITS:

Tabular minimisation – design of single output and multi output functions – design using Conventional AND,OR,NOT,NAND,NOR & EX-OR gates. Design using MSI & LSI devices – Digital multiplexer/selector, decoder, demultiplexer – design of 4 bit adder, carry look-ahead adder, magnitude comparator – BCD converter, logic implementations using ROM, PAL & PLA.

UNIT – III

INTRODUCTION TO SEQUENTIAL CIRCUITS:

Combinational Vs sequential circuits, Asynchronous Vs synchronous circuits – state table and state diagram – state assignment – Memory elements and their excitation functions – T flip-flop, D flip-flop, R-S flip-flop.

JK flip-flop and their excitation requirements – Design of synchronous sequenetial circuits like Sequence Detectors and binary counters.

UNIT-IV

CAPABILITIES AND MINIMISATION OF SEQUENTIAL MACHINES:

Melay and Moore machines – capabilities and limitations of finite state machine – state equivalence and machine minimisation.

UNIT-V

ALGORITHMIC STATE MACHINES:

ASM chart, timing considerations, control implementation. Design with multiplexers and PLA control.
Introduction to unate functions and threshold logic.

REFERENCES:

1. Switching and finite automata theory by Kohavi, TMH edition

2. Digital logic design by Mano.

3. Introduction to switching theory and logic design by F.J. Hill and Peterson, John Wiley Publications.

4. Digital Design with standard MSI and LSI by Thomas, Blakeslee, Wiley – Interscience publication.

CS2106 MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY
(Common to all Branches)

UNIT-I:

Introduction to Economics, Managerial Economics and Welfare Economics – scope and relation to other sciences, Demand Analysis – Law of demand and its assumptions and determinants, Elasticity of demand – price, income and cross elasticities – demand forecasting.

UNIT-II:

Theory of Production – Firm and industry – production function – input/output relations – Laws of returns – internal and external economics of scale. Cost analysis – cost concepts – fixed and variable costs – explicit and implicit costs – out of pocket costs and inputted costs, opportunity costs – cost – output relationship – Breakeven analysis.

UNIT-III

Capital – its significance – estimation of fixed and working capital requirements – methods of raising capital – introduction to capital budgeting – methods payback and discounted cash flow methods with problems.

UNIT –IV:

Markets – Competitive structures – price – output determination under perfect competition and monopoly – types of business organization features of propriarty, partnership and joint stock companies – Public sector enterprises – features and problems.

UNIT-V:

Analysis and interpretation of financial statements through ratios.

BOOKS FOR REFERENCE:

1. C.I. Savage and T. R. Small: Introduction to Managerial Economics.

2. J. C. Pappas and E. F Bringham: Managerial Economics

3. V. C. Mote, Samuel Paul and Gupta: Managerial Economics.

4. R. K. Mishra: Readings in Accounting and Finance.

CS2107 COBOL LAB

1. Develop a COBOL program to implement a sequential file of student information. A temporary file consists of information about the student name, student hall ticket number, 1-mid marks, 2-mid marks in 5 subjects. During the acceptance of 1-mid marks, zeros are moved to the fields of 2-mid marks. Update the file with 2-mid on availability and find a better 1st and 2nd mid marks in each subject. Print the finalized marks in 5 subjects for each students along with Aggregate, Name and Hall Ticket Number of the student with a neat heading giving information about the class, Semester, school details.

2. Develop a COBOL program to store and process the details of EAMCET DATA Maintain a master file in sequential organization with information as follows: Student name, Hall Ticket number, father's name, Age, Sex, Code, Category (Reserved Others).
   Create a temporary transaction file with name, hall ticket number, Age, Sex, Code, Category, marks in three subjects, mathematics, physics & chemistry as fields. Aggregate is not a field here.
   Sort the file to give ranking with the following conditions:
   For those instances where in aggregates of a number of students are equal the records should be sorted based on the next key and followed by marks in mathematics, physics.

3. Develop an extension to the above program to print the sorted records of a students As a :

i) General list with ranks also in a separate field.
ii) Reserved list of students with all details and their relative rank in general and reserved category.
iii) List of girl students with all details and their relative ranks in general and girls category.

4. Develop a COBOL program to maintain and generate bills in a super market. The Master file is maintained as indexed organization with the fields as item-code, item-name (or description), unit price. Generate bills for customers with the random requests about items as is common in any supermarket in the following format:

XYZ Super Market

Sl.NO.	ITEM NO.	ITEM DESCRIPTION	UNIT PRICE	QUANTITY	PRICE
1	123	Coco-Cola	50	2 Ltre	100/-
2					
3					
Total	Price				

5. Develop a cobol program to maintain and process a sequential file to generate electrical bills for the residents of a colony in a zone of the city. The information to be maintained is House number, Owner's Name, Zone Number, Previous meter reading and current meter reading.
   The current meter reading is an input given by the operator. After find the difference in the current & previous meter readings to find the number of units energy used, calculate the charge @ Rs.5/-. The bill should have the following details.

   APSEB

   House Number:

   Operator:

   Owner's Name:

   Zone:

   Previous meter reading:

   Current Meter reading:

   Unit charge:

   Total

6. Write a COBOL program to implement indexed files for the maintenance of bank Account in a local Bank. The necessary fields are:
   A/c. No., A/C Holder's Name, Balance amount, last mode of transaction.

i) Generate the monthly bank statement.
ii) Maintain the program as online.

CS2108 IC APPLICATIONS LAB
(Common for ECE,EIE,E.Cont.E, Mechatronics)
(Minimum 10 experiments should be conducted)

1. Integrator and Differentiator using 741 OPAMP.

2. A) Astable using 555
   B) Monostable using 555

3. Function generator using 741 OPAMP.

4. Voltage regulator using

5. Inverter transfer characteristics and study of logic gates.

6. Study of flip flops using Ics.

7. 7490 counters.

8. Half adder, full adder and subtractor

9. BCD to 7 segment decoder using 7447

10. Three terminal regulator 7805,7809,7912,565,PLL,566 VCO

11. D/A Converter

12. A/D Converter

13. Study of PLAS.

B.Tech (CSE) II year – II Semester
Effective from 1999-2000
COURSE STRUCTURE

CS2201	Probability and Statistics
CS2202	Electrical Technology
CS2203	Computer Organization
CS2204	Design and Analysis of Algorithms
CS2205	Operating Systems
CS2206	Object Oriented Programming
CS2207	Operating Systems Lab
CS2208	Object Oriented Programming Lab.

CS2201 PROBABILITY AND STATISTICS

UNIT-I

PROBABILITY: Sample spaces and events – counting – Probability – The Axioms of probability – some elementary Theorms – Conditional Probability – Baye's Theorem – mathematical Expectation and Decision making (unit 2.1 –2.8).

UNIT –II

PROBABILITY DISTRIBUTIONS: Random variables – The Binomial distribution – the mean and the variance of a probability distribution – Chebyshev's Theorem – The Poisson approximation to the Binomial Distribution – Poisson processes.

PROBABILITY DENSITIES: Continuous Random Variables – The Normal Distribution – The Normal approximation to the Binomial Distribution. (Units 3.1-3.7 except 3.3 and 4.1-4.3).

UNIT-III:

SAMPLING DISTRIBUTIONS: Populations and samples – The sampling distribution of the Mean (known) – The sampling Distribution of the mean (unknown) – The sampling distribution of the variance. (Units 6.1-6.4).

UNIT-IV:

INFERENCES CONCERNING MEANS: Point estimation – Interval estimation Bayesian Estimation – Tests of Hypotheses, Null Hypotheses and significance tests – Hypotheses concerning two means.

INFERENCES AND CONCERNING PROPORTIONS:

Estimation of proportions – Hypotheses concerning one proportion – Hypotheses concerning several proportions. The analysis of r x c tables Goodness of Fit. (Units 7.1-7.8 and 9.1-9.6 except 9.2).

UNIT – V

CURVE FITTING: The method of least squares – K references bases on the least – square estimators – curvilinear Regression – multiple regression – correlation – check list of key Terms (units 11.1-11.6).

TEXT BOOK

PROBABILITY AND STATISTICS FOR ENGINEERS BY IRWIN MILLER AND JOHN E. FREUND.PHI

REFERENCE BOOKS:

1. Fundamental of Mathematical Statistics – S. C. Gupta , V. K. Kapur (Chapters specified in brackets.

2. Introductory probability and statistical Applications – Kpaul Meyer.

3. Probability and Statistics for Engineers: Miller and Trend Kreyszig.

4. Schaum Series – Probability and Statistics.

CS2202 ELECTRICAL TECHNOLOGY
(Common to ECE,EIE,E.Cont. E, CSIT and BME)

UNIT – I

DC Machines: Principle of operation of DC generator – emf equation – types of generators – Magnetization and Load characteristics – application – Dc motor – Torque equation – types and characteristics – three point starter – efficiency calculation – Speed control.

UNIT-II

Transformers: Single phase transformer – Principle of operation – types – construction al features – emf equations – phasor diagram on no-load – and load – equivalent circuit – losses and efficiency – regulation – OC & SC tests – predetermination of efficiency and regulation.

UNIT-III

Three phase induction motors : Three phase induction motor – constructional features – principles of operation – types – slip torque characteristics – efficiency calculation – starting methods.

UNIT IV:

Synchronous Machines : Synchronous generators – constructional features types – emf equation – distribution and coil span factors – regulation by synchronous impedance method – principle of operation of synchronous motor – methods of starting.

UNIT –V:

Single phase motors: Single Phase induction Motors constructional features – shaded – pole motors – capacitor motors – AC servo motors – AC tachnometers, synchros, stepper motors – characteristics and applications.

TEXT BOOKS:

1. Electrical Machines – by S. K. Bhattacharya, T.M.H. Publications

2. Electrical machines and power systems – by Del Toro – PHI.\

REFERENCE BOOKS:

1. Electrical machines by I. J. Nagrath & D. P. Kothari, T.M.H. Publications 2nd edition.

2. Electrical Machines – by P.S. Bimbra, Khanna Publishers

3. Electrical Technology – by Edward Hughes, Addision – Wesley Longman inc. 7th edition.

4. Electrical Machines – by P. K. Mukherjee & S. chakravorti, Dhanpat Rai & Sons.

CS2203 COMPUTER ORGANIZATION
(Common To EEE,ECE,EIE,E.Cont.E,CSE,CSIT)

UNIT-I

Von Neumann Machine, computer components, functions, bus inter connection, PCI, ALU, integer arithmetic, addition, subtraction, multiplication and division, floating point arithmetic.

UNIT – II:

Machine Instruction set, types of operands, types of operations, addressing modes, instruction formats, processor organization, register organization, instruction cycle, instruction pipelining, pentium processor, power-PC processor, RISC.

UNIT-III

8085 Microprocessor Organization, assembly language programming of 8085, processor control unit, operation, micro-operations, hardwired control, micro program control, horizontal and vertical micro instructions, micro instruction sequencing and execution, nanoprogramming, Applications of Microprogramming.

UNIT-IV

Internal memory, semiconductor main memory, cache memory, DRAM organization, associate memory organization, Magnetic disk, CDROM, magnetic tape, memory management, memory hierarchy, partitioning, paging, virtual memory, demand paging scheme, segmentation.

UNIT V:

Input/Output, external devices, I/O modules, I/o addressing, programmed I/O, Interrupt driven I/O, priority, arbitration, DMA, I/O channel, I/O processor.

BOOKS:

1. "Computer Organization and Architecture" William Stalling, 4th Edition, PHI.

2. "Computer Architecture and Organization" Hayes, MH.

3. "Introduction to Microprocessors" Mathur.

CS2204 DESIGN AND ANALYSIS OF ALGORITHMS

UNIT-I

INTRODUCTION:

Algorithm analysis, Time complexity and space complexity, O notation Omega notation and Theta notation.

DIVIDE AND CONQUER:

General Method, merge sort, quick sort, strassen's matrix multiplication.

GREEDY METHOD:

General method, optimal storage on tapes, knapsack problem, minimum spanning tree.

UNIT-II

SET MANIPULATION ALGORITHMS:

Fundamental operation of sets, algorithm for UNION and FIND, introduction to optimal binary search tree, balanced tree schemes, 2-3 tree, AVL tree, dictionary, priority queue, mergeable heap, heap for priority queue.

UNIT-III

DYNAMIC PROGRAMMING:

Multistage graphs, optimal binary search trees, 0/1 knapsack problem, reliability design problem, travelling sales person problem.

UNIT-IV

SEARCH AND TRAVERSAL TECHNIQUES:

Efficient non-recursive binary tree traversal algorithms, tree traversal, breadth first search and traversal, depth first search and traversal, AND/OR graphs, game tree.

BACK TRACKING: General method, 8_queen problem, graph coloring problem.

UNIT-V:

BRANCH AND BOUND:

LC search, bounding, LC branch and bound, FIFO branch and bound.

ALGEBRAIC SIMPLIFICATIONA ND TRANSFORMATIONS:

General Method, Evaluation and interpolation, modular arithmetic.

TEXT BOOKS:

1. E. HOROWITZ and S. SAHNI: "Fundamentals of Algorithms", GALGPTIA.

2. AHO, HOPCRAFT AND ULLMAN: "Design and Analysis of Algorithms" Edition 1984.

CS2205 OPERATING SYSTEMS

UNIT-I

Computer system and Operating System overview: Overview of Computer System hardware – instruction execution – I/O function – Interrupts – memory hierarchy – I/O communication techniques. Operating systems objectives and functions – Evaluation of operating systems – Example systems. Process description and control: Process states – process description – process control – Processes and Threads – Examples of process description and control.

UNIT II

Concurrency: Principles of concurrency – mutual exclusion – software and hardware approaches – semaphores – monitors – message passing – readers/writers problem. Principles of deadlock – deadlock prevention, detection and avoidance – dining philosophers problem – Example systems.

UNIT III

Memory Management: Memory management requirements – loading programs into main memory – virtual memory – hardware and control structrures – OS software – Examples of memory management.

UNIT IV

Uniprocessor scheduling: types of Scheduling – Scheduling algorithms – I/O management and disk scheduling – I/O devices – Organization of I/O function – OS design issues – I/O buffering – Disk I/O – disk scheduling policies – examples system.

UNIT V

File management and security: Overview of file management – file organization and access – File directories – File sharing – Record blocking – secondary storage management – example system. Security: Security Threats – Protection – Intruders – Viruses – Trusted Systems.

TEXT BOOKS:

William Stallings – “Operating Systems” – PHI – Second Edition 1997.

REFERENCE BOOKS:

Charles Crowing – Operating System TMH 1998.

CS2206 OBJECT ORIENTED PROGRAMMING

Unit-I

Basics of Object Oriented Programming (OOP):

Introduction to OOP – Difference between OOP and procedure oriented Programming – Classes, objects and Methods – Overview of inheritance and Polymorphism.

Object Oriented Design:

Trends in software design – Notation for objects – Hybrid design methods – Seperation of Responsibilities – Responsibility driven design – Design phases and tools – step by step design – Grady Booch Approach.

UNIT-II:

Fundamentals of C & C++:

Structure of C/C++ program – Preprocessor directives – data types and declaration – Expressions and operator precedence – Program flow control – Functions – Scope of variables – Default arguments – Dynamic allocation – new and delete operators.

UNIT-III

Data Abstraction:

Class definition – controlling access to other functions – Different types of constructors – Destructor – Objects and classes – Dynamic creation and destruction of objects.

Polymorphism:

Overloading functions and operators – Run time polymorphism – overloading new and delete operators.

UNIT-IV

Inheritance:

Derived classes – syntax of derived classes – Access to the base class – overloading inherited member functions – multiple inheritance – virtual base class Virtual functions and Polymorphism: static and dynamic bindings – virtual functions – pure virtual functions – dynamic binding through virtual functions – Virtual function call mechanism – Implications of polymorphic use of classes – virtual destructors – calling virtual functions in a base class constructor.

UNIT-V

C++ I/O:

Standard I/O using C functions – stream I/O in C++ - manipulators – Formatted I/O – Overloading << and >> operators – File I/O.

Generic Classes in C++:

Necessity of Templates – Generic Classes using Macros – Class templates – Function Templates – Advantages of Templates.

Exception Handling in C++:

Benefits of exception handling-troubles with standard C functions (setjmp and longjmp) – Proposed exception handling mechanism for C++.

TEXT BOOK:

Barkakati – Object oriented Programming, PHI.

CS2207 OPERATING SYSTEMS LAB

1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority

2. Simulate all file allocation strategies
   a) Sequential b) Indexed c) Linked

3. Simulate MVT and MFT

4. Simulate all File Organization Techniques
   a) Single level directory b) Two level c) Hierarchical d) DAG

5. Simulate Bankers Algorithm for Dead Lock Avoidance

6. Simulate Bankers Algorithm for Dead Lock Prevention

7. Simulate all page replacement algorithms
   a) FIFO b) LRU c) LFU Etc…

8. Simulate Paging Technique of memory management.

CS2208 OBJECT ORIENTED PROGRAMMING LAB

1. Program illustrating function overloading feture.

2. Programs illustrating the overloading of various operators
   Ex: Binary operators, Unary operators, New and delete operators etc.

3. Programs illustrating the use of following functions:
   a) Friend functions. b) Inline functions c) Static Member functions
   d) Functions with default arguments.

4. Programs to create singly and doubly linked lists and perform insertion and deletion Operations.
   Using self referential classes, new and delete operators.

5. Programs illustrating the use of destructor and the various types of constructors (no arguments, constructor, constructor with arguments, copy constructor etc).

6. Programs illustrating the various forms of inheritance:
   Ex. Single, Multiple, multilevel, hierarchical inheritance etc.

7. Write a program having student as on abstract class and create many derived classes such as Engg, Science, Medical, etc. from student class. Create their objects and process them.

8. Write a program illustrating the use of virtual functions.

9. Write a program which illustrates the use of virtual base class.

10. Write a program which use the following sorting methods for sorting elements in ascending order.
    Note: use function templates
    a) Bubble sort b) selection sort c) quick sort.

11. Write program which illustrates the use of class templates.
    Ex. a) Stack class b) Queue class.

12. Write programs illustrating file handling operations:
    Ex. a) Copying a text file b) Displaying the contents of the file etc.

13. Write programs illustrating the console I/O operations.

14. Write programs illustrating how exceptions are handled (ex: division-by-zero, overflow and underflow in stacks etc.).

B.Tech (CSE) III Year – I Semester
Effective from 1999-2000.

COURSE STRUCTURE

CS3101	Interfacing through Microprocessors
CS3102	Operations Research
CS3103	Data Communications
CS3104	Theory of Computation
CS3105	Principles of Programming Languages
CS3106	System Programming
CS3107	Interfacing through microprocessor lab
CS3108	Systems Programming Lab

CS3101 INTERFACING THROUGH MICROPROCESSORS

UNIT-I

8086 ARCHITECTURE:

Functional Diagram, register organization, addressing modes instructions, pc hardware, functional schematic, various terminology.

UNIT-II

A L PROGRAMMING OF 8086:

Simple programs, programs using the assembler, implementation of FOR loop, WHILE, REPEAT and IF-THEN-ELSE features, string manipulation procedures, macros.

UNIT-III

INTERFACING II:

Interfacing of switches, keyboards, LED's, 7-segment display units, transducers, actuators, stepper motor, A/D and D/A, CRT interface, floppy interface.

UNIT-V

INTERFACING III:

Serial communication standards, USART interfacing RS-232, IEEE-488, 20mA current loop, prototyping and trouble shooting, software debugging tools, MDS.

BOOKS:

1. D. V. HALL: Microprocessors and Interfacing.

2. GIBBSON: Microprocessor Software and Hardware.

CS3102 OPERATIONS RESEARCH

UNIT-I

Development:

Definition, characteristics and phases, scientific method, types of models, general methods for solving, operations research models.

Allocation:

Introduction, linear programming formulation, graphical solution, simplex method, Artificial variable technique, duality principle.

UNIT-II:

Transportation problem: formulation, optimal solution, unbalanced transportation.

Assignment Problem:

Formulation, optimal solution, variations problem, degenaracy i.e. non square (mxn) matrix, restrictions.

Sequencing:

Introduction, optimal solution for processing each of n jobs through three machines, travelling salesman problem (i.e.) shortest acyclic route models.

UNIT-III

Replacement:

Introduction, replacement of items that deteriorate when money value is not counted and counted, replacement of items that fail completely (i.e)., group replacements.

Theory of games:

Introduction, minimax (maximum) criterion and optimal strategy solution of games with saddle points, rectangular games without saddle points.

UNIT-IV:

Waiting Lines:

Introduction, single channel, poisson arrivals, exponential service times, unrestricted queue, with infinite population and finite population models, single channel, poisson arrivals, exponential service times with infinite population and restricted queue, multi channel, poisson arrivals, exponential service time infinite population and unrestricted queue.

UNIT-V:

Inventory:

Introduction, single, item, deterministic models, production is instantaneous or at a constant rate, shortages are allowed or not allowed and withdrawals from stock is continuous, purchase inventory model with one price break, shortages are not allowed, instantaneous production demand production or purchase cost is relevant, stochastic models, demand may be discrete or variable or instantaneous production, instantaneous demand and no setup cost.

Dynamic Programming:

Introduction, Bellman's principle of optimality, solutiontion of problems with finite number of stages.

TEXT BOOKS:

1. OPERATIONS RESEARCH – S.D. Sharma

2. OPERATONS RESEARCH – P. K. Gupta & D. S. Hira.

3. OPERATIONS RESEARCH – R. D. Asrhedkar & R. V. Kulkarni.

CS3103 DATA COMMUNICATIONS

UNIT-I

Digital Modulation Techniques:

Review of ASK, FAK, and PSK binary FSK and PSK, QPSK, eight phase, PSK, quadrature AM, 8QAM, carrier recovery, differential BPSK.

UNIT-II:

Data Communication Methods:

Data communication circuit configuration, topologies: point to point multidrop, star, ring, transmission modes, 2-wire and 4-wire operations, data communication codes, error detection methods, line control unit, UART, USRT, serial interface, terminal types, data modems: modulation, interface, operations on 2-wire, 4-wire and dial-up lines, multistream and intelligent modems, acoustic coupler, loop delay.

UNIT III

Data Communication Protocols:

Asynchronous protocols, synchronous protocols, IBM bisync protocol, SDLC, HDLC, HDLC line procedures, HDLC data transfer.

UNIT IV:

Digital Multiplexing:

Time division multiplexing, codec, combchip, block diagram of PCM_TDM system, muldem, sampling data signals, line encoding, T carriers, repeater, frame synchronization, bit interleaving and word interleaving, concentrator, statistical multiplexer, introduction to frequency concentrator, statistical multiplexing, data transmission on FD systems, bybrid data, DUV, DAV, DAVID, DIV.

UNIT-V

Line Protocols:

Half duplex point-to point, half duplex multi-point, full-duplex point – to point and multi-point.

BOOKS:

1. W. Tomasi: “Advanced Electronic communication systems: (ch. 1, 2, 3, 4, 5, 6) 1987.

2. T. Housley: “Data Communications and Teleprocessing systems (Ch. 2, 3, 4, 5, 6, 7, 10, 11, 12, 14, 15, 17, 18, 19) P.H.I.

CS3104 THEORY OF COMPUTATION

UNIT I:

Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, non deterministic finite automaton, deterministic finite automaton, equivalence between NFA and DFA, Conversion of NFA into DFA, minimisation of FSM, equivalence between two FSM's, Moore and Melay machines.

UNIT II:

Regular sets, regular expressions, identity rules, manipulation of regular expressions, equivalence between RE and FA, inter conversion, pumping lemma, closure properties of regular sets (proofs not required), regular grammars, right linear and left linear grammars equivalence between regular linear grammar and FA, inter conversion, enumeration of properties of CFL (proofs omitted).

UNIT IV

Turing Machine, definition, model, acceptance of CFL, equivalence of CFL and PDA, inter conversion, enumeration of properties of CLF (Proofs omitted).

UNIT V:

Chomsky hierarchy of languages, linear bounded automata and context sensitive language, Introduction to DCFL and DPDA, LR(O) grammar, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

TEXT BOOK:

1. Hopcroft H.E. and Ullman J. D. "Introduction to Automata Theory Languages and Computation".

2. Lewis H.P. & Papadimition C.H. "Elements of Theory of Computation", Prentice Hall.

CS3105 PRINCIPLES OF PROGRAMMING LANGUAGES

UNIT I

Formal definition of a language factors to be considered in designing a language, criteria for programming language design, salient features of a programming language, syntax, semantics, pragmatics, defining syntax, BNF notation and syntax graphs for constructs of PASCAL, imperative versus applicative languages, functional programming, object oriented programming, basics of LISP.

UNIT II:

Variables and the assignment statements, binding time and storage allocation, constants and initialization, expression, conditional statements, iterative statements, the go to statement and labels, Data type and typing, enumerated data types, elementary data types, pointer data type, structured data types, type coersion, type equivalence.

UNIT III:

The basics of scope and extent, run-time implementation, an extended example, binding, scope and extent together, general features of procedures, parameter evaluation and passing methods with examples from specific languages like pascal, “C”, algol and DA, aliasing.

UNIT IV:

Overloading, generic functions, coroutines, Introduction to data abstraction, data abstraction in modula, abstract data types, Design issues of exception handling, exception handling in PL/1 and ADA.

UNIT V:

Basic concepts of concurrency, semaphors, monitors, message passing, concurency in ADA, logic programming with PROLOG.

TEXT BOOKS:

1. HOROWITZE: “Fundamentals programming languages”, GALGOTIA PUBLICATIONS.

2. WINSTON : LISP

3. CLOCKSIN & MELLISH : PROLOG

CS3106 SYSTEMS PROGRAMMING

UNIT I:

INTRODUCTION TO PC ARCHITECTURE (Intel Pentium, PC Hardware, segments and addressing, Registers, ASSEMBLY LANGUAGE BASICS Machine Addressing, special DEBUG features, Data Definition Directives, Addressing Formats, COM Programs.

UNIT II:

PROGRAM LOGIC AND CONTROL JMP, LOOP and conditional jump Instructions, Boolean operations, Shifting, Rotating, KEYBOARD AND SCREEN PROCESSING, String Operations, Arithmetic Operations and Table Processing, Searching, sorting.

UNIT III:

MACRO WORKING AND LINKING, Macro Definition, The LOCAL Directive, reception Directives, conditional Directives, Intra-segment and Inter-segment calls, passing parameters, ADVANCED SCREEN AND KEYBOARD PROCESSING, BIOS Interrupt 16H for Keyboard input, Extended Function Keys.

UNIT IV:

DISK PROCESSING Disk Organization, File allocation Table, File Control Block, Sequential Reading of a Disk File, Random Processing, Miscellaneous disk Processing Features, File Handlers and Extended DOS functions, BIOS Disk Operations, DOS MEMORY MANAGEMENT Program Segment Prefix, DOS Memory Control, Program loader, program overlays, Resident programs.

UNIT V

ASSEMBLERS AND MACROPROCESSOR, Design of Assembler, Data Structure, format of Databases, Algorithm, Macro instructions, Features of a macro facility, A two-pass algorithm and a single pass algorithm. LOADERS, Compile-and-go Loaders, General Loader Schemes, Absolute Relocating and Direct-Linking loaders.

TEXT BOOKS:

1. Peter Abel, IBM PC Assembly Language and Programming, Second Edition, PHI (Chapters 1 to 18, 20 to 22)

2. John J. Donovan, Systems Programming, McGraw Hill (Chapter 3,4 and 5).

CS3107 INTERFACING THROUGH MICROPROCESSORS LAB

8086 Assembly Language Programming Exercises:

1. 16-bit addition
2. Sorting the n numbers in ascending & descending order.
3. Sum of squares of n numbers, sum of cubes of n numbers
4. Arithmetic mean of n numbers.
5. Interfacing of switch and display
6. Interfacing of A/D converter
7. Interfacing of D/A converter
8. Stepper motor control using microprocessor
9. Interfacing Keyboard/Display controller
10. Implementation of real time clock
11. Microprocessor based temperature controller
12. Microprocessor based traffic controller

CS3108 SYSTEM PROGRAMMING LAB

1. Fixed Point arithmetic
2. Text processing
3. Keyboard and screen processing
4. Macro writing
5. Disk processing
6. Memory resident programs
7. DOS file management
8. Copy protection schemes
9. Implementation of simple editor
10. Adding Syntax directed facilities to an editor.

B.Tech (CSE) III Year – II Semester
Effective from 1999-2000

COURSE STRUCTURE

CS3201	Management Science
CS3202	Computer graphics
CS3203	Computer Networks
CS3204	Artificial Intelligence
CS3205	Language processors
CS3206	Database management Systems
CS3207	Language Processor Lab
CS3208	DBMS Lab

CS3201 MANAGEMENT SCIENCE
(Common to all branches)

UNIT-I

Concept of management – Administration, Organization – functions of management, evolution of management thought – Organization – Principles of Organization-types-Organization charts-Managerial objectives and social responsibilities.

UNIT-II

Cooperate planning-mission, objectives, programs, goals, environmental scanning – SWOT-strategy formation and implementation – Plant location and Plant layout concept – statistical quality control.

UNIT-III

Human resources management-manpower planning-personal management – basic functions of personnel management-job evaluation and merit rating.

UNIT-IV

Productivity – Batch and mass production – work study – basic meaning – basic procedure involved in methods, study and work measurement – Marketing functions – Channels of distribution.

UNIT-V

Network Analysis to project management – PERT/CPM – Application of Network techniques to engineering problems.

Cost Analysis – Project Costing.

REFERENCE BOOKS:

1. Principles of management by KOONTZ and O. Donnal.
2. Industrial Engineering and Management by O. P. Khanna
3. Marketing by Philips Kother
4. Marketing by Rajan Lyer
5. PERT/CPM by L. S. Srinadh
6. Business Policy by Gluck (TMH).

CS3202 COMPUTER GRAPHICS

UNIT I

Geometry and line Generation: Points, Lines, Planes, Pixels and frame buffers, types of display devices, DDA and Brasenham's Line Algorithms, Brasenham's algorithms for circle generation, algorithm for ellipse generation, character generation, Aliasing and Antialiasing.

UNIT II

Graphics Primitives: Display Files, Display processors, Algorithms for polygon generation, Polygon filling algorithms, NDC (Normalized device co-ordinates), pattern filling.
2D Transformations: Scaling, Rotation, translation, homogenous for ordinates, rotation about arbitrary point Reflections, Zooming.

UNIT III

Segment tables, operations on segments, data structures for segments and display files.
Windowing and clipping: Window, viewport, viewing transformation clipping, line and polygon clipping, generalized clipping, multiple windowing.

UNIT IV

3D Graphics: 3D primitives, 3D Transformations, Projections, parallel perspective, isometric, viewing transformations, Hidden surfaces and line removal, Painter's algorithm, Z-buffers, Warnocks algorithm, shading algorithms, 3D clipping.

UNIT V

Curves and surfaces: Generation of curves and surfaces using Hermite, Beziere and B-Spline, sweeping method of interpolation- Raster graphics Architecture: Simple Raster-Display system, Display processor system, standard graphics pipeline, multiprocessor Raterilization Architecture.
Pipeline and parallel front end architecture.

TEXT BOOKS:

1. David F Rogers – Procedural Elements for Computer Graphics – McGraw-Hill.

2. Foley, Vandam, Feiner & Huges – Computer Graphics Principles and Practice – Addison Wesley.

3. Newman & Sproul – Principles of Interactive Computer Graphics.

4. David F Rogers and Adams – Mathematical Elements for Computer Graphics.

CS3203 COMPUTER NETWORKS

UNIT-I

Types of Networks: Reference Models: OSI reference model, TCP/IP reference model, examples of networks: Novell Netware, Arpanet, Internet, Examples of Data Communication Services: X.25 Networks, Frame relay, Broad band ISDN and ATM.

Physical Layer: Transmission media: Narrow band, broad band ISDN and ATM.

UNIT-II

Data Link layer – Design Issues, Error detection and Correction, Elementary and sliding window datalink protocols, Datalink layer in HDLC, Internet, ATM, Medium Access Sub layer – ALOHA, carrier sense multiple access, collision free protocols, IEEE standards – 802.3, 802.4, 802.5: Transparent and source routing bridges.

UNIT-III

Network layer: virtual circuit and datagram subnets – Routing algorithm shortest path routing, Flooding, Herarchical routing, Broad-cast, multicast, distance vector routing.

Congestion control Algorithms – General principles of congestion prevention policies.

Internet working: The Network layer in the Internet and in the ATM Networks.

UNIT-IV

Transport Layer: Transport services, Elements of Transport protocols, Internet Transport Protocols; ATM AAL Layer Protocols.

UNIT-V

Application Layer-Network Security: Domain Name system: Electronic Mail; The world wide WEB; Multi Media;

TEXT BOOKS:

1. Computer Networks – Third Edition – Andrew S. Tanenbaum, Prentice Hall of India.

2. An Engineering Approach to Computer Networks – S. Keshav, International Student Edition, Addisson Wesley.

CS3204 ARTIFICIAL INTELLIGENCE

UNIT I

Introduction:
AI problems, AI Technique, defining problem as a static space search production systems, problem characteristics, production system characteristics.

Heuristic Search Techniques:
Generate – and – test, hill climbing, Best – First Search, problem reduction, constraint satisfaction, means-ends analysis.

UNIT II

Knowledge Representation:
Issues, predicate logic, resolution, representing, knowledge using rules, forward versus Backward reasoning, Matching, control knowledge, weak slot – and – filler structures, semantic nets, frames, stong slot – and – filler structures, conceptual dependency, scripts.

UNIT III

Reasoning Techniques:
Nonmonotonic reasoning, Augmenting a problem solver, implementation of depth first search and Breadth first search, statistical reasoning, probability and Bayes theorem, certainty factors and rule-based systems, Bayesian Networks.

UNIT IV

Game Playing:
Minimax search, alpha – beta cutoffs, planning system, Goal stack planning, hierarchical planning, understanding, understanding as constraint satisfaction, Waltz algorithm, natural language processing, synatactic processing, Augmented transition Networks, semantic analysis, case grammars.

UNIT V

Learning:
Role learning, learning by taking advice, learning in problem solving, learning from examples, Winston's learning program, Decision trees, perception, vision, speech recognition, Navigation, manipulation, Robot architectures, Expert systems, shell, explanation, knowledge acquisition.

TEXT BOOK:

"Artificial Intelligence", 2nd Edition., E.Rich and K. Knight (TMH).

CS3205 LANGUAGE PROCESSORS

UNIT-I

Basic functions of language translator, difference between compiler and interpreter, boot strapping, logical phases of a compiler, difference between a pass and a phase. Lexical analysis, reasons for separating lexical analysis from syntax analysis, finite automate and state diagram, scanning algorithm, regular expressions, LEX program to perform Lexical analysis of high level languages (PASCAL and C) typical lexical errors.

UNIT-II

Type grammars, parse tree, ambiguity in writing grammars, methods to remove ambiguity, methods of parsing, topdown and bottom-up concepts, Brute-Force method, top-Down parsing problems and solutions, recursive descent parsing, LL(1) grammars, error handling, bottom-up methods, operator precedence, simple precedence operator grammar, precedence functions, parsing of LR(k) and LALR(k) grammars, error handling, system directed translation, syntax directed definitions, construction of syntax trees, bottom-up evaluation of s-attributed definitions, 1-attributed definitions, top-down translation, bottom-up evaluation of inherited attributes.

UNIT III

Semantic analysis, typical semantic errors, type checking, type conversion, specification of a simple type checker, equivalence of type expressions, overloading of functions and operators polymorphic functions, storage allocations, strategies of storage allocation, static, dynamic tables, organization, data structures for symbol table, trees, arrays, linked lists, hash tables, factors.

UNIT IV

Intermediate code forms, polish notation, quadruples, triples, indirect triples, trees, abstract machine code, transformation into internal forms, semantic routines, translation grammars, code generation, machine dependent and machine independent code generation, peephole optimization, folding, elimination of redundant operations, loop optimization, frequency reduction, strength reduction, global flow analysis.

UNIT V

Code generation, forms of object code, machine dependent code optimization, register allocation for temporary and user defined variables, reducing the memory access times by exploiting addressing modes, assemblers, phases of an assembler, design of assembler, symbol tables, macros, phases of a macro processor, design of a macro processor.

BOOKS:

1. Ullman – “Principles of compiler design:, Narosa.
2. Aho Ullman & Ravisetty : Compilers Principles, Technique and tools” addision Wesley

REFERENCE:

1. Trembley and Sorenson: “Theory and practice of compiler writing”, Mc.Graw Hill.
2. Dhamdher “Systems Software”, Prentice hall.

CS3206 DATABASE MANAGEMENT SYSTEMS

UNIT I

Introduction to database systems: Overview- File systems Vrs DBMS., Various data models – Levels of abstraction – Structures of DBMS – Relational Model – Relations and Integrity Constraaints – Relational Algebra and Calculus – SQL – Basic SQL Query – Nested Queries – Aggregate operators – Embedded SQL – Dynamic SQL – Security, views, SQL-QBE.

UNIT II

File Organization: Storage media – Buffer management – Record and page formats – File Organizations – various kinds of indexes and external sorting.

UNIT III

Query optimization and evaluation: Introduction to Query Processing Selection operation – Projection operation – join operation – set operation and Aggregate operation – Relational Query Optimization – Translating SQL queries – mho algebra – Estimating the cost – Relational Algebra Equivalences.

UNIT IV

Database Design: Overview of data base design – ER model – features of ER model – Conceptual design using ER model, scheme refinement and Normal Forms – Schema Refinement – Use of decompositions – functional Dependencies – Normal forms _ mUlti valued Dependencies.

UNIT V

Concurrency control and recovery: concepts of transaction – Transactions and schedules – Lock based concurrency control – Lock management – specialized locking techniques – Concurrency control without locking – crash recovery – Introduction to crash recovery – Log recovery – check pointing – media recovery.

TEXT BOOKS:

1. “Database management Systems, Raghu Rama krishnan, MGH.

REFERENCE BOOKS:

1. “Database Management and Design”, G. W. Hansen and J. V. Hansen, PHI, 1999.

2. “Database Systems concepts”, Henry Korth and Others

3. “An introduction to Database systems”.

CS3207 LANGUAGE PROCESSORS LAB

1. Develop a lexical analyzer to recognize a few patterns in PASCAL, C and FORTRAN (Ex: identifiers, constants, comments, operators, etc.,).
2. Write a program to parse using Brute force technique of Topdown parsing
3. Develop on LL(1) parser (construct parse table also).
4. Develop an operator precedence parser (Construct parse table also)
5. Develop a recursive descent parser
6. Write a program for generating for various intermediate code forms

   i) Three address code ii) Polish notation
7. Write a program to simulate heap storage allocation strategy
8. Generate Lexical analyzer using LEX.
9. Generate YACC specification for a few syntactic categories.
10. Given any intermediate code form implement code optimization techniques.

CS3208 DATABASE MANAGEMENT SYSTEMS LAB

1. Creating tables for various relations (in SQL)

2. Implementing the queries in SQL for

a) Insertion
b) Retrival (Implement all the operation like Union, Intersect, Minus, in, exist, aggregate functions (Min.,Max…) etc…
c) Updation
d) Deletion

3. Creating Views

4. Writing Assertions

5. Writing Triggers

6. Implementing Operations on relations (tables) using PI/SQL

7. Creating FORMS

8. Generating REPORTS.

B.Tech (CSE) IV Year – I Semester
Effective from 1999-2000

COURSE STRUCTURE

CS4101	Software Engineering
CS4102	Distributed Systems
CS4103	Visual Programming Techniques
CS4104	Java programming
CS4105	(Elective-I) Advanced Computer Architecture
CS4106	(Elective-I) Fault Tolerant Systems
CS4107	(Elective-II) Digital Speech and Image processing
CS4108	(Elective-II) Neural Networks
CS4109	Visual Programming Lab
CS4110	Java Lab

CS4101 SOFTWARE ENGINEERING

UNIT-I

Software and Software Engineering, The importance of software – software – software myths – software engineering paradigms – generic view of software engg. Software metrics. Measures and metrics – estimation – risk analysis – scheduling – Size roiented Metrics – function oriented metrics – Metrics – metrics of software quality.

UNIT II

Software project estimation and planning, Decomposition techniques – LOC and FP estimation – effect estimation – risk analysis – identification – projection – assessment – management and monitoring – software re-engineering. Requirement analysis. Requirement analysis – tasks – analyst – software prototyping – specification principles – representation and the software requirements specification.

UNIT III

Object oriented analysis and data modeling – Object oriented concepts – identifying objects – specifying attributes – defining operations – inter object communication – finalizing object definition – object oriented analysis modeling – data modeling – data objects, attributes and relationships – entity relationship diagrams. Alternative analysis techniques requirement analysis methods – data structured oriented methods – data structured system development – Warner diagrams and the DSSD approach – Jackson system development.

UNIT IV

Software design fundamentals – the design process – design fundamentals – effective mdoular – design – data flow oriented design – transform analysis – transaction – analysis – design heuristics. Object Oriented design – methods – refining operations – Program components & interfaces – implementation detail design. User interface design – human factors – human computer interface design – interface – design guidelines – Interface standards.

UNIT V

Software quality Assurance – Software quality factors – Quality assurance, quality metrics – Halstead's S/W Science. Software, Testing Techniques S/W testing fundamentals – White Box testing, Blackbox – testing, Validation Testing, system Testing, debugging, software maintenance maintainability – maintenance tasks – Reverse engineering and Re-engineering.

TEXT BOOK:

Roger S. Pressman – "Software Engineering", Mc.Graw Hill.

CS4102 DISTRIBUTED SYSTEMS

UNIT I

Introduction to distributed systems: goals of distributed system, hardware and software concepts, design issues.
Communication in distributed systems: Layered protocols, ATM networks, the client-server model, remote procedure call and group communication.

UNIT II

Synchronization in distributed systems: Clock Synchronization, mutual exclusion, Election Algorithms, the Bully algorithm, a ring algorithm, atomic transactions, dead lock in distributed systems, distributed dead lock prevention, and distributed dead lock detection.

UNIT III

Processes and processors in distributed systems: Threads, system, models, processor allocation, scheduling in distributed system, fault tolerance and real time distributed systems.

UNIT IV

Distributed file systems: Distributed file systems design, distributed file system implementation, trends in distributed file systems.
Distributed shared memory: What is shared memory, consistency models, page based distributed shared memory, shared variable, distributed shared memory, object based DSM.

UNIT V

Case study MACH: Introduction to MACH, Process management, in MACH, Memory management in MACH, communication in MACH, UNIX emulation in MACH.
Case study DCE: Introduction to DCE threads, RPC's, Time service, directory service, security service, distributed file system.

TEXT BOOK:

Distributed operating system – Andrew. S. Tanenbaum, PHI.

CS4103 VISUAL PROGRAMMING TECHNIQUES

UNIT I

Visual programming Environment: integrated development environment for Visual C++ and Visual Basic components of Visual C++ and Visual Basic.

UNIT II

Parts of Visual C++ program, applications object, main window object, view object document object. Event oriented windows programming device context, Microsoft foundation classes: An overview.

UNIT III

Reading keystrokes, handling mouse, creating menus, toolbars, buttons, status bar prompts, dialog box, check box, radio buttons, list boxes, combo boxes, sliders, serialization, file handling, multiple documents.

UNIT IV

Understanding and working with objects, controls, file handling, debugging.

UNIT V

DLL's, OLE Object Technologies, Creating Internet programs using Visual C++ and Visual Basic. Creating Active X controls, connecting to database using visual C++ and Visual Basic.

SUGGESTED READING:

1. Steven Holzner, Microsoft Visual C++5, BPB Publications, 1997.

2. Paul Sanna, using Visual basic for Applications, PHI, 1997.

3. Noel Jerke, the Complete reference Visual Basic 6, TMH.

CS4104 JAVA PROGRAMMING

UNIT I

Object oriented programming concept, comparing JAVA with C, JAVA programming language syntax, variables, data types, statements and expressions, control statements if-else, for, while and do-while loops, switch statements, named structures, functions , parameter passing, static modifier, console programming.

UNIT II

Features of JAVA: classes and interfaces, Threads and multithreaded programming, Synchronization of threads, dead locks, Exception handling, Introduction to packages, math package, lang package, util package.

UNIT III

Applets programming: Events, Even driven programs, handling events like buttons, mouse, keyboards etc., Applets and Applets package, fonts, colors, Graphics, Images, Sounds, AWT components, Layout managers, writing event driven programs using components.

UNIT IV

Streams: I/O in JAVA, I/O packages, handling files random access files, chaining streams.

UNIT V

Network programming: net package, TCP/IP programming, UDP programming, client/server model implementation, getting information from internet.
Advanced concepts of JAVA: CORBA, BEANS, JAVADOC ,RMI, Servelets.

TEXT BOOKS:

1. “Introduction to Java programming:, Daneal/Yong PHI

2. “Introduction to Java Programming, a primar”, Balaguruswamy.

CS 4105 (ELECTIVE-I) ADVANCED COMPUTER ARCHITECTURE

UNIT I

Trends towards parallel processing, parallelism in uniprocessor systems, parallel computer structures, architectural classification schemes, parallel processing applications, memory hierarchy in parallel processing systems, addressing schemes. Pipleline concept, linear pipelining and space time diagram, classification of pipeline processors, nonlinear pipeline and reservation table, interleaved memory organization, arithmetic pipelines, principles of designing pipeline processors, vector processing.

UNIT II

SIMD array processors, organization, masking and routing mechanisms, inter PE communications, SIMD inter connection networks, single stage and multi stage networks, mesh connected Illiac networks, parallel shifter, shuffle exchange and omega networks, parallel algorithms for array processors, matrix multiplication, polynomial evaluation, parallel sortings, fast fourier transform computation, associative array processor.

UNIT III

Multiprocessor architecture, loosely coupled and tightly coupled multiprocessor systems, processor characteristics, inter connection networks crossbar switch and multi port memories, multi stage networks, banyan and delta networks parallel memory organization, multiprocessing operating systems, classification and requirements, software requirements for MPS, language features to exploit parallelism, multi processor scheduling strategies, parallel algorithms.

UNIT IV

Data flow computers, control flow versus data flow, data flow computer architectures, data flow graphs, data flow languages, Dennis and Irvine machines, dataflow design alternatives, dependence driven and multi level event driven approaches, VLSI computing structures, systolic array architecture, VLSI matrix arithmetic processor.

UNIT V

Performance evaluation of computers, measurements and parameters, stochastic model simulation model, study of architecture of Cray and Cyber super computers, massively parallel processor systems, image processing on MPP, C.mmp multiprocessor system, crazy X MP super computer.

TEXT BOOKS:

1. Wang K. Briggs F.A “Computer Architecture and parallel processing”, McGraw Hill.

2. Stone H. “Introduction to Computer Architecture”, Galgotia.

CS4106 (ELECTIVE-I) FAULT TOLERANT SYSTEMS

UNIT-I

Basic Concepts:

Failure and Faults, reliability and failurerate, relation between eligibility and Mean-time – Between failures, maintainability and availability, reliability of series and parallel systems, Modeling of faults, stuck at, Bridging (short-circuit), stuck open, transient and intermittent faults.

Test Generation:

Fault diagnosis of digital systems, Test generation for combinational logic circuits – conventional methods, Random testing, transition count testing and signature analysis.

UNIT-II

Fault Tolerant Design:

Basic concepts – static, dynamic, Hybrid, and self-purging redundancy, shift-over Modular Redundancy (SMR). Triple Modular redundancy, SMR.

Reconfiguration, use of error correcting codes. Time redundancy, software redundancy, fail soft-operation, examples of practical fault tolerant systems, Introduction to fault Tolerant Design of VLSI Chips.

UNIT III

Self Checking Circuits:

Design of Totally self-checking checkers, checkers using m-out of –n codes, Berger codes and low cost residue code. Self-checking sequential Machines, partially self checking circuits.

Fail Safe Design:

Strongly fault secure circuits, failsafe Design of sequential circuits using partition theory and Berger codes, totally self-checking PLA design.

UNIT-IV

Design for Testable Combination Logic circuits:

Basic concepts of test ability, controllability and observability. The read-muller expansion technique, three level OR-AND-OR design, use of control logic and syndrome-testable design.

UNIT-V

Design of Testable Sequential circuits The scan-path technique – level sensitive scan design (LSSD) and Random Access scan technique, built-in-test, built-in-test of VLSI chips, design for autonomous self-Test, Designing Testability into logic Boards.

TEXT BOOKS:

Parag K. Lala, “Fault Tolerant and Fault Testable, Hardware design” PHI 1985.

REFERENCE BOOKS:

1. LALA: Digital systems design using PLD’s PHI 1990.

2. N. N. Biswas: Logic Design theory, PHI 1990.

CS4107 (ELECTIVE-II) DIGITAL SPEECH AND IMAGING PROCESSING

UNIT-I

The image model and image acquisition image shape, sampling, intensify images, color images, range images, image capture, scanners, satellite imagery.

UNIT-II

Statistical and spatial operations Grey Level transformations, histogram equilization, multi image operations.

Spatially dependent transformations, templates and convolution window operations, Directional smoothing, other smoothing techniques.

UNIT-III

Segmentation and Edge detection region operations, Basic edge detection, second order detection, crack edge detection edge following, gradient operators, compass & laplace operators.

UNIT-IV

Morphological and other area operations, basic morphological operations, opening and closing operations, area operations morphological transforms.

UNIT-V

Image compression: Types and requirements, statistical compression, spatial compression, contour coding, quantizing compression.

TEXT BOOKS:

1. Andrion Low-Introductory computer Vision and Image Processing MCGraw Hill International Edition.

2. Gongalez – Digital Image Processing.

CS4108 (ELECTIVE-II) NEURAL NETWORKS

UNIT-I

Introduction and fundamentals of Artificial Neural Networks, Biological prototype, Artificial neuron, Single layer artificial, neural networks, multilayer artificial neural networks, training of artificial neural networks.

UNIT-II

Perceptrons: Perceptron Representation, perceptron learning, perceptron Training Algorithm.

Back propagation: Introduction to Back propagations and Back propagation training algorithm, counter propagation networks.

UNIT-III

Kohonen self organizing networks: Introduction, the Kohonen, algorithm, weight training, Grossberg layer, Training the Grossberg Layer.

UNIT-IV

Hopfiled Networks: Introduction, The Hopfiled model, Hopfiled network algorithm, Boltzmann's machine applications of Hopfiled Networks, Associative Memories, Bidirectional Associative Memories.

UNIT-V

Adaptive Resonance Theory: Architecture of Adaptive Resonance Theory, Algorithm, Applicability of Artificial neural Networks to pattern Recognition and Image Processing, Dimensionality of neural Networks for pattern Recognition.

TEXT BOOKS:

1. Neural computing: Theory and practice – Waserman

2. An introduction to Neural Computing – I. Alexander and Helen Mart – William Jackson.

CS4109 VISUAL PROGRAMMING LAB
(Exercises to be repeated both in VB and VC++)

1. Design and implement a business and scientific calculator.

2. Design and implement a personal diary

3. Design and implement a pay roll system using some backend database.

4. Design and implement a personal information system use images also to display the photo of a candidate.

5. Design and implement a file browser.

CS4110 JAVA LAB

1. Programs illustrating overloading and overriding methods in JAVA.

2. Programs illustrating the implementation of various forms of inheritance (Ex. Single, Hierarchical, Multilevel inheritance etc.,).

3. Programs which illustrates the implementation of multiple inheritance using interfaces in JAVA.

4. Programs which illustrate the manipulation of strings:

   Ex: 1) Sorting an array of strings in ascending order.
   2) Frequency count of words and characters in a text file. Etc.,

5. Programs for sorting and searching a list of elements.

6. Programs for addition and multiplication of matrices.

7. Programs to create packages in JAVA.

8. Programs to create multiple threads in JAVA.

9. Programs to write applets to draw the various shapes:

   a) Cylinder b) Cube c) Square inside a circle
   d) Circle inside a square e) Polygons etc.,

10. Create and manipulate labels, lists, text fields, textareas and panels.

11. Understand and handle mouse events and keyboard events.

12. Understand and use layout managers.

13. Create and manipulate the following: Textareas, canvases, scrollbars, frames, menus, dialog boxes.

14. Programs which illustrates the use of files and streams.

15. Programs on linked lists stacks and queues (Creation, insertion and deletion).

16. Client/Server interaction with stream socket connections (Use NET packages).

B.Tech (CSE) IV Year – II Semester
Effective from 1999-2000

COURSE STRUCTURE

CS4201	(Elective III) Simulation and Modeling
CS4202	(Elective-III) Robotics
CS4203	(Elective-IV) Data Mining and Ware Housing
CS4204	(Elective-IV) Advanced Databases.
CS4205	Project Work.

CS4201 (ELECTIVE-III) SIMULATION AND MODELING

UNIT-I

System Models:

Concepts, continuous and Discrete systems, System Modeling, types of models, subsystems, corporate model, system study.

System Simulation: Techniques, comparison of simulation and analytical methods, types of simulation, distributed log models, cobweb models.

UNIT-II

Continuous system simulation:

Numerical solution of differential equations, Analog computers, Hybrid computers, continuous system simulation languages CSMP, system dynamic growth models, logistic curves.

UNIT-III

Probability concepts in simulation:

Monte Carlo techniques, stochastic variables, probability functions, Random Number Generation algorithms.

UNIT-IV

Queing Theory:

Arrival Pattern distributions, servicing times, queuing disciplines , measure of queues, mathematical solutions to queuing problems.

Discrete system simulation: Events, generation of arrival pattern, simulation programming tasks, analysis of simulation output.

UNIT-V

GPSS & SIMSCRIPT:

General description of GPSS and SIMSCRIPT, programming in GPSS. Simulation Programming Techniques: Data Structures, implementation of activities, events and queues, event scanning, simulation algorithms in GPSS and SIMSCRIPT.

TEXT BOOK:

1. Geoffery Gordon: System Simulation, PHI.

CS4202 (ELECTIVE III) ROBOTICS

UNIT I

Introduction to robot technology, robot anatomy, Robot kinematics and dynamics – direct kinematics and inverse kinematics problems. LaGrange-Euler formulation, Newton-euler formulation, generalized D-Alembert's equations of motions.

UNIT II

Robot motion analysis and end effectors – control of puma robot and computed torque technique, minimum time control, variable structure control, non-linear decoupled feedback control, resolved motion control, adaptive control, types of end effectors and mechanical grippers. Sensors – tactilla sensors, proximity and range sensors.

UNIT III

Low level and High level vision Image acquisition, image geometry preprocessing, segmentation, description, segmentation and description of three dimensional structures, recognition and interpretation.

UNIT IV

Characteristics of robot level languages and robot task level languages. Artificial intelligence, use of LISP programming in robotics. Robot intelligence and tasks planning – state space search, problem reduction, use of predicate login, means – ends analysis, problem solving, robot learning, robot task planning – basic problems in task planning.

UNIT V

Robot cell design and control – cell layouts, multiple robots and machine interference, consideration in work cell design, work cell control, interlocks, error detection and recovery. Work cell controller, robot cycle time analysis, graphical simulation of robotic work cells.

TEXT BOOKS:

1. "Robotics (control and vision and intelligence)" by F. S. Fu, R. C. Cronzaleg and C. S. U. Lee, McGraw Hill (ISE)

CS4203 (ELECTIVE – IV) DATA MINING AND WARE HOUSING

UNIT-I

Introduction – Data warehouse delivery method – system process – typical process flow within a data ware house – query management process – process architecture – meta data – data maintaining.

UNIT-II

Design aspects – Designing dimension tables – Designing starflake schgeme – Multi dimensional scheme – parity strategy aggregator – Data making META DATA – System Data warehouse process – load manager.

UNIT-III

Hardware and operational design – server hardware, network hardware – parallel technology – security input on design of Hardware – backup and recovery – Service level management – Operating the datawarehouse.

UNIT-IV

Capacity planning – Estimating the load – Timing the data warehouse – Assessing performance – Taking the data load and queries – Testing data warehouse – Development of test plan – Testing the data base and operational environment.

1) Data Warehousing in the real world – Sam Anabory & Dennis Murray – Addission – Wesley, 1997.

CS4204 (ELECTIVE-IV) ADVANCED DATABASES

UNIT-I

Distributed databases features – distributed database management systems – Review of databases and computer networks. Levels of distribution transparency – reference architecture – types of data fragmentation – distributed transparency for read only applications and update applications – distributed database access primitives and integrity constraints.

UNIT-II

Distributed database design – a frame work for distributed database design – the design of database fragmentation – the allocation of fragments. Translational global queries to fragment queries – equivalence transformation for queries – transforming global queries into fragment queries – distributed grouping and aggregate function evaluation – parametric queries.

UNIT-III

Query optimization – problems in query optimization – objectives in query process optimization – similar representation of queries – model for query optimization – join query – general queries.

UNIT-IV

Distributed transactions and concurrency control. Frame work for transaction management – properties and goals of transaction – atomicity of distributed transactions – recovery procedures – concurrency control for distributed transactions. Foundations of distributed concurrency control – distributed deadlocks – concurrency control based on time stamps.

UNIT-V

Reliability and protection: Basic concepts – non-blocking commitment protocols. Reliability and concurrency control – determining a consistent view of network – detection and resolution of inconsistency – check point and cold restart – Authorization and protection – site to site protection – user identification – authorization rules.

TEXT BOOK:

1. Ceri and Pelagatti “Distributed databases principles and systems” McGraw Hill.

REFERENCE BOOK:

1. Raghuramakrishnan – “Database management system” McGraw Hill.