ANNA UNIVERSITY :: CHENNAI 600 025

CURRICULUM 2004

B.E. COMPUTER SCIENCE AND ENGINEERING

SEMESTER III

Code No.	Course Title	L	T	P	M
THEORY					
MA1201	Mathematics III	3	1	0	100
CS1201	Design and Analysis of Algorithms	3	1	0	100
CS1202	Digital Principles and Systems Design	3	1	0	100
CS1203	System Software	3	0	0	100
CS1204	Object Oriented Programming	3	0	0	100
GE1301	Professional Ethics and Human Values	3	0	0	100
PRACTICAL					
CS1205	Object Oriented Programming Lab	0	0	3	100
CS1206	Digital Lab	0	0	3	100
CS1207	System Software Lab	0	0	3	100

SEMESTER IV

Code No.	Course Title	L	T	P	M
THEORY					
MA1252	Probability and Queuing Theory	3	1	0	100
EE1291	Electrical Engineering and Control Systems	4	0	0	100
EC1291	Analog and Digital Communication	3	1	0	100
CS1251	Computer Architecture	3	1	0	100
CS1252	Operating Systems	3	0	0	100
CS1253	Visual Programming	3	0	0	100
PRACTICAL					
EE1292	Electrical Engineering and Control Systems Lab	0	0	3	100
CS1254	Operating Systems Lab	0	0	3	100
CS1255	Visual Programming Lab	0	0	3	100

SEMESTER V

Code No.	Course Title	L	T	P	M
THEORY					
MG1351	Principles of Management	3	0	0	100
MA1256	Discrete Mathematics	3	1	0	100
CS1301	Database Management Systems	3	1	0	100
CS1302	Computer Networks	3	0	0	100
CS1303	Theory of Computation	3	1	0	100
CS1304	Microprocessors & Micro controllers	3	1	0	100
GE1302	Communication Skill & Seminar**	0	0	3	-
PRACTICAL					
CS1305	Network Lab	0	0	3	100
CS1306	Microprocessors & Micro controllers Lab	0	0	3	100
CS1307	DBMS Lab	0	0	3	100

SEMESTER VI

Code No.	Course Title	L	T	P	M
THEORY					
CS1351	Artificial Intelligence	3	0	0	100
CS1352	Principles of Compiler Design	3	1	0	100
CS1353	Software Engineering	3	0	0	100
CS1354	Graphics and Multimedia	3	0	0	100
MA1251	Numerical Methods	3	1	0	100
	Elective – I	3	0	0	100
GE1351	Presentation Skill & Seminar**	0	0	3	-
PRACTICAL					
CS1355	Graphics and Multimedia Lab	0	0	3	100
CS1356	Compiler Design Lab	0	0	3	100

SEMESTER VII

Code No.	Course Title	L	T	P	M
THEORY					
MG1401	Total Quality Management	3	0	0	100
CS1401	Internet Programming	3	0	0	100
CS1402	Object Oriented Analysis and Design	3	1	0	100
IT1252	Digital Signal Processing	3	1	0	100
	Elective II	3	0	0	100
	Elective III	3	0	0	100
PRACTICAL					
CS1403	Case Tools Lab	0	0	3	100
CS1404	Internet Programming Lab	0	0	3	100

SEMESTER VIII

Code No.	Course Title	L	T	P	M
THEORY					
IT1402	Mobile Computing	3	0	0	100
	Elective IV	3	0	0	100
	Elective V	3	0	0	100
PRACTICAL					
CS1451	Project Work	0	0	12	200
CS1452	Comprehension**	0	0	2	-

CM125 Chemistry I **3 0 0 100**

1. CHEMICAL THERMODYNAMICS **9**

Definition of free energy and spontaneity - Maxwell relations - Gibbs-Helmholtz equation - Van't hoff equations - Stoichiometry and energy balances in Chemical reactions.

2. DYNAMICS OF CHEMICAL PROCESSES **10**

Basic concepts - composite reactions (opposing, parallel and consecutive reactions) - Collision theory - Thermodynamic formulation of reaction rates - unimolecular reactions - Chain reactions (Stationary and non-stationary) - Enzyme Kinetics - Michaelis - Menten Equation.

3. ELECTRODICS **8**

Types of electrodes and cells - Nernst Equation - emf measurement and its applications - Principles of chemical and electrochemical corrosion - corrosion control (Sacrificial anode and impressed current methods).

4. WATER **8**

Water quality parameters - Definition and expression - Estimation of hardness (EDTA method) - Alkalinity (Titrimetry) - Water softening (zeolite) - Demineralisation (Ion- exchangers) and desalination (RO) - Domestic water treatment.

5. POLYMERS **10**

Monomer - Functionality - Degree of polymerisation - Classification based on source and applications - Addition, Condensation and copolymerisation - Mechanism of free -radical polymerisation - Thermoplastics and thermosetting plastics - Processing of plastics - Injection moulding, blow moulding and extrusion processes.

Total No of periods: 45

CM125 Chemistry I **3 0 0 100**

Text Books:

1. *Alkins P.W., " Physical Chemistry ", ELBS, IV Edition, 1998, London.*

References:

1. *Balasubramanian M.R., Krishnamoorthy S. and Murugesan V., " Engineering Chemistry ", Allied Publisher Limited., Chennai, 1993.*
2. *Karunanidhi M., Ayyaswamy N., Ramachandran T and Venkatraman H., " Applied Chemistry ", Anuradha Agencies, Kumbakonam , 1994.*
3. *Sadasivam V., " Modern Engineering Chemistry - A Simplified Approach ", Kamakya Publications, Chennai , 1999.*
4. *Kuriakose, J.C. and Rajaram J., " Chemistry in Engineering and Technology ", Vol. I and II, Tata McGraw-Hill Publications Co.Ltd, New Delhi ,1996.*
5. *Jain P.C. and Monica J., " Engineering Chemistry ", Dhanpat Rai Publications Co.,(P) Ltd., New Delhi, 1998.*

GE131 Engineering Mechanics **3 1 0 100**

1. BASICS **5**

Introduction - Units and Dimensions - Laws of Mechanics - Vectors - Vectorial representation of forces and moments - Vector operations.

2. STATICS OF PARTICLES **8**

Coplanar Forces - Resolution and Composition of forces - Equilibrium of a particle - Forces in space - Equilibrium of a particle in space - Equivalent systems of forces - Principle of transmissibility - single equivalent force.

3. EQUILIBRIUM OF RIGID BODIES **7**

Free body diagram - Types of supports and their reactions - requirements of stable equilibrium - Equilibrium of Rigid bodies in two dimensions - Equilibrium of rigid bodies in three dimensions.

4. PROPERTIES OF SURFACES AND SOLIDS **12**

Determination of Areas and Volumes - First moment of area and the centroid - second and product moments of plane area - Parallel axis theorems and perpendicular axis theorems - Polar moment of inertia - Principal moments of inertia of plane areas - Principal axes of inertia - Mass moment of inertia - relation to area moments of inertia.

5. FRICTION **4**

Frictional Force - Laws of Coloumb friction - Simple Contact friction - Rolling Resistance - Belt Friction.

6. DYNAMICS OF PARTICLES **16**

Displacement, Velocity and acceleration their relationship - Relative motion - Curvilinear motion - Newton's Law - Work Energy Equation of particles - Impulse and Momentum - Impact of elastic bodies.

7. ELEMENTS OF RIGID BODY DYNAMICS **8**

Translation and Rotation of Rigid Bodies - Velocity and acceleration - General Plane motion - Moment of Momentum Equations - Rotation of rigid Body - Work energy equation.

Total No of periods: 60

GE131 Engineering Mechanics **3** **1** **0** **100**

Text Books:

1. *Beer and Johnson, " Vector Mechanics for Engineers ", Vol. 1 " Statics " and Vol. 2 " Dynamics ", McGraw Hill International Edition, 1995.*
2. *Merriam, " Engineering Mechanics ", Vol.1 " Statics " and Vol.2 " Dynamics 2/e ", Wiley International, 1988.*

References:

1. *Rajasekaran S. and Sankara Subramanian, G., " Engineering Mechanics - Statics and Dynamics ".*
2. *Irving, H., Shames, " Engineering Mechanics - Statics and Dynamics ", Thrid Edition, Prentice-Hall of India Pvt.Ltd., 1993.*
3. *Mokoshi, V.S., " Engineering Mechanics ", Vol.1 " Statics " and Vol.2 " Dynamics ", Tata McGraw Hill Books, 1996.*
4. *Timoshenko and Young, " Engineering Mechanics ", 4/e, McGraw Hill, 1995.*
5. *McLean, " Engineering Mechancis ", 3/e, SCHAUM Series, 1995.*

MA131 Mathematics I **3 1 0 100**

. (Revised Syllabus For B.E. / B.Tech. Programmes - Effective From June 2002)

1. MATRICES **9**

Characteristic equation - Eigen values and eigen vectors of a real matrix. Some properties of eigen values, Cayley-Hamilton theorem, Orthogonal reduction of a symmetric matrix to diagonal form - Orthogonal matrices - Reduction of quadratic form to canonical form by orthogonal transformation.

2. THREE DIMENSIONAL ANALYTICAL GEOMETRY **9**

Direction cosines and ratios - Angle between two lines - Equation of a plane - Equation of a straight line - Co-planer lines - Shortest distance between skew lines - Sphere - Tangent plane - Plane section of a sphere - orthogonal spheres.

3. GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS **9**

Curvature - cartesian and polar coordinates - Circle of curvature - Involutes and Evolutes - Envelopes - properties of envelopes - Evolute as envelope of normals.

4. FUNCTIONS OF SEVERAL VARIABLES **9**

Functions of two variables - Partial derivatives - Total differential - Differentiation of implicit functions - Taylor's expansion - Maxima and Minima - Constrained Maxima and Minima by Lagrangean Multiplier method - Jacobians - differentian under integral sign.

5. ORDINARY DIFFERENTIAL EQUATIONS **9**

Simultaneous first order linear equations with constant coefficients - Linear equations of second order with constant and variable coefficients - Homogeneous equation of Euler type - equations reducible to homogeneous form - Method of reduction of order - Method of variation of parameters.

6. TUTORIAL **15**

Total No of periods: 60

MA131 Mathematics I **3 1 0 100**

Text Books:

1. *Kreyszig, E., " Advanced Engineering Mathematics " (8th Edition), John Wiley and Sons (Asia) Pte Ltd., Singapore, 2001*
2. *Veerarajan, T., " Engineering Mathematics ", Tata McGraw Hill Publishing Co., NewDelhi, 1999.*

References:

1. *Grewal, B.S., " Higher Engineering Mathematics " (35th Edition), Khanna Publishers, Delhi , 2000.*
2. *Kandasamy, P., Thilagavathy, K., and Gunavathy, K., " Engineering Mathematics ", Volume I (4th Revised Edition), S. Chand & Co., New Delhi, 2000.*
3. *Narayanan, S., Manicavachagom Pillay, T.K., Ramanaiah, G., " Advanced Mathematics for Engineering Students ", VolumeI (2nd Edition), S. Viswanathan (Printers & Publishers), 1992.*
4. *Venkataraman, M.K. " Engineering Mathematics - First year " National Publishing Company, Chennai (2nd Edition), 2000.*

PH125	**Physics I**	**3**	**0**	**0**	**100**

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1. PROPERTIES OF MATTER **9**

Elasticity - stress-strain diagram-factors affecting elasticity - Twisting couple on a wire-Shafts-Torsion pendulum-Depression of a cantilever- Young's modulus by cantilever-Uniform and Non Uniform bending-I shape girders-Production and measurement of high vacuum-Rotary pump-Diffusion pump-Pirani Gauge-Penning gauge-Viscosity-Oswald Viscometer-Comparision of viscosities.

2. ACOUSTICS **9**

Acoustics of buildings-Absorption coefficient-Intensity-Loudness-Reverberation time-Sabine's formula-Noise pollution-Noise control in a machine-Ultrasonics-production-Magnetostriction and Piezoelectric methods-Applications of ultrasonics in Engineering and Medicine.

3. HEAT AND THERMODYNAMICS **9**

Thermal conductivity-Forbe's and Lee's Disc methods-Radial flow of heat-Thermal conductivity of rubber and glass-Thermal insulation in buildings-Laws of thermodynamics-Carnot's cycle as heat engine and refrigerator-Carnot's theorem-Ideal Otto and Diesel engines-Concept of entropy-Entropy Temperature diagram of carnot's cycle.

4. OPTICS **9**

Photometry-Lummer Brodhum photometer-Flicker Photometer-Antireflection coating-Air wedge-Testing of flat surfaces-Michelson's Interferometer and its applications-Photoelasticity and its applications-Sextant-Metallurgical microscope-Scanning electron microscope.

5. LASER AND FIBRE OPTICS **9**

Principle of lasers-laser characteristics-Ruby-NdYAG, He-Ne, CO2 and semiconductor lasers-propagation of light through optical fibers-types of optical fibre-Applications of optical fibres as optical waveguides and sensors.

Total No of periods: 45

PH125 Physics I **3 0 0 100**

Text Books:

1. Arumugam.M., " Engineering Physics ", Anuradha Publications, 1998.

References:

1. *Resnik R. and Halliday D., " Physics ", Wiley Eastern, 1986.*
2. *Nelkon M. and Parker.P., " Advanced Level Physics ", Arnald-Heinemann, 1986.*
3. *Vasudeva A.S., " Modern Engineering Physics ", S. Chand and Co., 1998..*
4. *Gaur, R.K., and Gupta, S.L., " Engineering Physics ", Dhanpat Rai and Sons, 1988.*
5. *Mathur, D.S, " Elements of properties of Matter ", S.Chand & Co., 1989.*

CM126 Chemistry Lab	**0**	**0**	**2**	**100**

. 30

1. Preparation of standard solutions.
2. Estimation of hardness of water by EDTA method
3. Estimation of different types and amounts of alkalinity in water - Indicator method
4. Determination of dissolved oxygen - Winkler's method.
5. Estimation of iron in water - Spectrophotometric method.
6. Estimation of sodium in water - Flame Photometric method
7. Determination of molecular weight of polymers-Viscometric method.
8. Determination of total dissolved solids in water.
9. Corrosion experiments:
   * Corrosion rate measurements
   * Inhibition efficiency.
10. Electrochemistry experiments:
   * Determination of emf.
   * Single electrode potential
   * Potentiometric and conductometric titration

Total No of periods: 30

GE132 Computer Practice I **1 0 3 100**

1. FUNDAMENTALS OF COMPUTERS AND OPERATING SYSTEMS **4**

Evolution of Computers - Organization of Modern Digital Computers-Single user Operating System-Multitasking OS-GUI

2. OFFICE AUTOMATION **11**

a) Word Processing
b) Data Base Management System
c) Spread Sheet Package
d) Presentation Software

3. PRACTICALS **45**

Total No of periods: 60

Text Books:

1. *Ghosh Dastidar, Chattopadhyay and Sarkar, " Computers and Computation - A Beginner's Guide ", Prentice Hall of India, 1999.*

References:

1. *Nelson, Microsoft Office 97, Tata McGraw Hill, 1999.*
2. *Taxali, " PC Software for Windows Made Simple ", Tata McGraw Hill, 1999.*

GE133 Workshop Practice	**0**	**0**	**4**	**100**

1. SHEET METAL **10**

Tools and Equipments - Fabrication of tray, cone, etc., with sheet metal

2. WELDING **10**

Tools and Equipemts - Arc Welding of butt joint, Tap Joint, Tee fillet etc., Demonstration of gas welding.

3. FITTING **10**

Tools and Equipments- Practice in Chipping, Filling, Drilling - making Vee joints, square and dove tail joints.

4. CARPENTRY **10**

Tools and Equipments-Planning Practice-making halving joint and dove tail joint models.

5. FOUNDRY **10**

Tools and Equipments Preparation of moulds of simple objects like flange, gear V- grooved pulley etc.

6. SMITHY **10**

Tools and Equipments - Demonstration for making simple parts like keys, bolts etc.

Total No of periods: 60

GE133	**Workshop Practice**	**0**	**0**	**4**	**100**

References:

1. *Venkatachalapathy V.S., " First Year Engineering Workshop Practice ", Raamalinga Publications, Madurai, 1999.*
2. *Kanaiah P.and Narayana K.C., " Manual on Workshop Practice Scitech Publications ", Chennai, 1999.*

PH126 Physics Lab	**0**	**0**	**2**	**100**

1. PRACTICALS **30**

1. Young's modulus by non uniform bending.
2. Rigidity modulus and moment of inertia using Torsion Pendulum
3. Viscosity of a liquid by Poiseuille's method.
4. Wavelength determination using grating by Spectrometer.
5. Particle size determination by Laser
6. Thermal conductivity by Lees' disc.
7. Thickness of wire by Air wedge.
8. Thermo emf measurement by potentiometer.

Total No of periods: 30

CS131 Programming and Data Structures **3 1 0 100**

1. PROGRAM DEVELOPMENT **5**

Top-down approach-Bottom-up approach-Stepwise refinement-Modularity_Pseudo code-Sequence-Selection-Iteration-Recursion-Structured Programming Methodologies.

2. C LANGUAGE **10**

Primitive Data Types-Control-Function-Aggregate data types-Input/Output-Preprocessor.

3. LINEAR DATA STRUCTURES **12**

Lists-Stacks-Queues-Representation using arrays-Singly linked lists-doubly linked lists-application.

4. NONLINEAR DATA STRUCTURES **10**

Trees-Binary trees-Representation-Traversals-Binary search trees-Tables-Representation-Hashing techniques.

5. SEARCHING, SORTING AND FILES **8**

Linear search-Binary search-Insertion sort-Bubble sort-Files-Sequential-Random.

6. TUTORIAL **15**

Total No of periods: 60

CS131 Programming and Data Structures **3** **1** **0** **100**

Text Books:

1. *Kruse R.L., Tondo C.L. and Leung B.P, " Data Structures and Program Design in C "', Prentice Hall, 1997.*
2. *Tenenbaum A.M and Augenstein M.J, " Data Structures using C ", Prentice Hall of India, 1997.*

References:

1. *Alkelly and Iro Pohl, " A Book on C ", Addison Wesley, 1998.*

2. *Horowitz, Sahni, Mehta, " Fundamentals of Data Structures in C ", Galgotia Publication, 1997.*

3. *Brian W.Kernigham and Pike R., " The Practice of Programming ", Addison Wesley, 1999.*

4. *Yuksel Uckan, " Problem Solving Using C", McGraw Hill, 1999.*

5. *Brian W.Kernigham and Dennis Ritchie, " C Programming Language ", Prentice Hall of India. 1990.*

MA035 Discrete Mathematics **3 1 0 100**

1. LOGIC **9**

Statements-Truth Tables-connectives-Normal forms-Predicate Calculus-Inference theory for statement calculus and Predicate Calculus.

2. COMBINATORICS **9**

Review of Permutation and combination-Mathematical Induction-Pigeon hole principle-Principle of inclusion and exclusion-Generating function-Recurrence relations.

3. GROUPS **9**

Semi groups-Monoids-groups-permutation group-Consets-Lagranges theorem-Group homomorphism-Kernal-Rings and Fields (definitions and Examples only).

4. LATTICES **9**

Partial ordering- Posets-Hasse diagram-Lattices-Properties of Lattices-Sub Lattices-Special Lattices-Boolean Algebra.

5. GRAPHS **9**

Introduction to Graphs-Graph terminology-Representation of Graphs-Graph Isomorphism-Connectivity-Euler and Hamilton Paths.

6. TUTORIAL **15**

Total No of periods: 60

MA035 Discrete Mathematics **3** **1** **0** **100**

Text Books:

1. *" Discrete Mathematical Structures with Applications to Computer Science ", by Tremblay J.P, and Manohar R., McGraw Hill Book Company, 1975, International Edition, 1987. Sections: 1-2.1 to 1-2.4; 1-2.6 to 1-2,14; 1-3.1 to 1-3.5; 1-4. 1 to 1-4.3; 1-5.1 to 1-5.5; 1-6.4 and 1-6.5 for Logic. Sections: 3-1.1 to 3-2.3; 3-5.1 to 3-5.5 for Groups Rings and Fields. Sections:2-3.8 and 2-39; 4-1.1 to 4.2.2 for Lattices.*
2. *" Discrete and Combinatorial mathematics ", Ralph P., Grimaldi, Addison-Wesley Publishing Company, Reprinted in 1985. Sections : 1.1. to 1.3; 4.1 and 4.2.; 5.5; 8.1 to 8.3; 9.1 to 9.5; 10.1, 10.2 and 10.4 for Combinatorics.*
3. *" Discrete Mathematics and its Applications ", Kenneth H.Rosen, McGraw Hill Book Company, 1999. Sections: 7.1 to 7.5.*

Internet References:

The following URL (Universal Resource Locator) can also be contacted for Lecture Notes on Discrete Mathematics.

(a) http://www.mhhe.com/math/advmath/rosen/index.mhtml#aboutau.
(b) http://www.cs.stedwards.edu/-phil/Math24/Lectures/index.htm.
(c) http://www.ms.uky.edu/-jlee/DiscreteMath.html (you may need a java enabled browser to view this)

MA132 Mathematics II **3 1 0 100**

. (Revised Syllabus For B.E. / B.Tech. Programmes - Effective From June 2002)

1. MULTIPLE INTEGRALS **9**

Double integration in Cartesian and polar coordinates - Change of order of integration - Area as a double integral - Triple integration in Cartesian coordinates - Change of variables - Gamma and Beta functions.

2. VECTOR CALCULUS **9**

Curvilinear coordinates - Gradient, Divergence, Curl - Line, surface & volume integrals - Statements of Green's, Gauss divergence and Stokes' theorems - Verification and applications.

3. ANALYTIC FUNCTIONS **9**

Cauchy Riemann equations - Properties of analytic functions - Determination of harmonic conjugate - Milne-Thomson's method - Conformal mappings : Mappings
w = z +a, az, 1/z, z2 and bilinear transformation.

4. COMPLEX INTEGRATION **9**

Cauchy's theorem - Statement and application of Cauchy's integral formulae - Taylor's and Laurent's expansions - Singularities - Classification - Residues - Cauchy's residue theorem - Contour integration - Circular and semi Circular contours (excluding poles on real axis).

5. STATISTICS **9**

Moments - Coefficient of correlation - Lines of regression - Tests based on Normal and t distributions, for means and difference of means - Chi Square test for goodness of fit.

Total No of periods: 45

MA132 Mathematics II **3 1 0 100**

Text Books:

1. *Kreyszig, E., " Advanced Engineering Mathematics " (8th Edition), John Wiley and Sons, (Asia) Pte Ltd.,Singapore, 2000.*
2. *Grewal, B.S., " Higher Engineering Mathematics " (36th Edition), Khanna Publishers, Delhi 2001*

References:

1. *Kandasamy, P., Thilagavathy, K., and Gunavathy, K., " Engineering Mathematics ", Volumes I & II (4th Revised Edition), S. Chand & Co., New Delhi, 2001.*
2. *Narayanan, S., Manicavachagom Pillay, T.K., Ramanaiah, G., " Advanced Mathematics for Engineering Students ", Volumes I & II (2ndEdition), S.Viswanathan (Printers & Publishers, Pvt, Ltd.), 1992.*
3. *Venkataraman, M.K. " Engineering Mathematics III - A ", National Publishing Company, Chennai, (13th Edition), 1998.*

PH136 Semiconductor Physics and Opto Electronics **3 0 0 100**

1. SEMICONDUCTING MATERIALS **9**

Structure and bonding Schrodinger's equation-Partical in a box Density of states-Intrinsic conductivity-Extrinsic semiconductors-PN junction theory LED-Materials used in computers and communication system-PIN photo diodes- Frequency response of silicon photo diodes-High speed and long wavelength photo diodes.

2. MODERN ENGINEERING MATERIALS **9**

Super conducting materials-High Tc super conductors-Applications= Liquid crystals-Liquid crystal display systems-Merits and demerits-Metallic glasses and their applications-Shape memory alloys and applications-IC packaging materials.

3. OPTOELECTRONIC SWITCHIGN DEVICES **9**

Analog and digital modulators-Franz keldysh and strak effect modulators-Quantum well-Electro absorption modulators-Electro optics modulators-Optical switching and logic devices.

4. FIBER OPTICAL COMMUNICATIONS **9**

Principles of ligh transmission through fiber-fiber index profiles-Modes of propagation-Losses in fibers-Dispersion-Ligh sources for fiber optics-Fiber optic communication link-Modulators and detectors-Fiber optic communication link-Modulators and detectors-Fiber amplifiers-Soliton based coherent optical fiber communication.

5. MAGNETIC/OPTICAL DATA STORAGE MATERIALS **9**

Magnetic material parameters-Bubble materials-rare earth garnets-Disk memories-Flexible disk storage systems-Floppy disks-Tapes and drives-Charge coupled devices(CCD)-Optical data storage-Disk data storage-Recording and read out of information-CD ROM-Magneto-optical recording and read out-Different storage and retrieval techniques-Holographic optical data storage.

Total No of periods: 45

PH136 Semiconductor Physics and Opto Electronics **3** **0** **0** **100**

Text Books:

1. *John Allison, " Electronic Engineering Materials and Devices ", Tata McGraw Hill, 1985.*

References:

1. *Arumugam M.," Material Science ", Anuradha ublishers, 1997.*
2. *Gerd Geiser, " Optical Fiber Communications ", McGraw Hill, 1993.*
3. *Pallab Bhattacharya, " Semiconductors Optolectronic Devices ", Prentice Hall of India, 1995.*
4. *Thomas C.Bartee, " Computer Architecture and Logic Design ", McGraw Hill, 1991.*

GE134 Engineering Graphics **1 0 3 100**

1. PRINCIPLES OF GRAPHICS 16

Two dimensional geometrical construction - Conic sections, involutes and cycloids - Representation of three dimensional objects - Principles of projections - standard codes of principles.

2. ORTHOGRAPHIC PROJECTIONS 28

Projections of points, straight line and planes - ' Auxiliary projections '- Projection and sectioning of solids - Intersection of surfaces - Development of surfaces.

3. PICTORIAL PROJECTIONS 8

Isometric projections - ' Perspectives '- Free hand sketching.

4. COMPUTER GRAPHICS 8

Hardware - Display technology - Software - Introduction to drafting software.

Total No of periods: 60

Text Books:

1. *Narayanan, K.L., and Kannaiah, P., " Engineering Graphics ", Tata McGraw-Hill Publishers Co., Ltd., 1992.*

References:

1. *William M. Neumann and Robert F.Sproul, " Principles of Computer Graphics ", McGraw Hill, 1989.*
2. *Warren J. Luzzadder and John M. Duff, " Fundamentals of Engineering Drawing ", Prentice-Hall of India Private Ltd., Eastern Economy Edition, 1995.*
3. *Natarajan K.V., " A Text Book of Engineering Drawing ", Private Publication, Madras, 1990.*
4. *Mathur, M.L. and Vaishwanar, R.S., " Engineering Drawing and Graphics ", Jain Brothers, New Delhi, 1993.*

CS231	**Introduction to Analysis of Algorithms**	**3**	**1**	**0**	**100**

1. ADVANCED DATA STRUCTURES **9**

Heaps-Height Balanced Trees-Applications-Graphs-Representations-Traversal.

2. ALGORITHM ANALYSIS **12**

Mathematical foundations-Big "oh" notation-Searching-Worst case - Tournament method-Finding the largest and second largest-lower bound-Time space requirements.

3. SORTING AND STRING MATCHING ALGORITHMS **9**

Quick Sort-Heap Sort-Merge Sort-External Sort-String Matching-Knuth-Morris Pratt algorithm-Analysis.

4. GRAPH ALGORITHMS **6**

Minimal spanning trees-Shortest paths-Cut vertices-Bi-connected Components-Analysis.

5. "HARD" PROBLEMS **9**

Definition-Examples-Approximation Algorithms-Classical Problems-Solutions.

6. TUTORIAL **15**

Total No of periods: 60

CS231 Introduction to Analysis of Algorithms **3** **1** **0** **100**

Text Books:

1. Sara Baase, " Computer Algorithms-Introduction to Design and Analysis ", Addison-Wesley Publishing Company, 1991.

References:

1. *Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to Algorithms", Prentice Hall of India Pvt.Ltd. 1998.*
2. *Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, " Computer Algorithms ", Galgotia Publications Pvt.Ltd, 1999.*
3. *Donald E.Knuth, " The Art of Computer Programming ", Volume 3, Second Edition, Addison_Wesley Publishing Company, 1999.*

CS232 Digital Systems **3 1 0 100**

1. NUMBER SYSTEMS AND BOOLEAN ALGEBRA **10**

Binary number systems and conversion-Binary arithmetic-Binary codes-Boolean algebra-Basic operations-Basic Theorems-Boolean functions-Canonical forms-Simplification of Boolean functions-Karnaugh maps-Tabulation method-Digital logic gates-Integrated circuits.

2. COMBINATIONAL LOGIC **12**

Multilevel gate networks-NAND and NOR gates-Multiple output network-Multiplexers-Decoders-Network for arithmetic operations-Iterative networks-Combinational network design-Read only memories-Programmable logic devices.

3. SEQUENTIAL LOGIC **12**

Gate delays and timing diagrams-Flip flops-Analysis of clocked sequential networks-State reduction-Sequential network design-Registers-Counters-Shift registers.

4. ALGORITHMIC STATE MACHINES(ASM) **11**

ASM Charts-Timing considerations-Derivation of ASM charts-Realization of ASM charts-Control implementations-Design examples-Analysis and Design of asynchronous sequential networks-State assignment and races-Flow table reduction-Hazards.

5. TUTORIAL **15**

Total No of periods: 60

CS232 Digital Systems **3 1 0 100**

Text Books:

1. *Charles H.Roth Jr., " Fundametnals of Logic Design ", IV edition, Jaico publishing house, Mumbai 1999.*

References:

1. *Ronald J.Tocci, " Digital System: Principles and Applications ", 6th Edition, PHI, 1997.*
2. *M.Morris Mano, " Digital Design ", II Edition, Prentice Hall, 1996.*
3. *Thomas C.Bartee, " Computer Architecture and Logic Design ", Tata McGraw Hill Publishing, 1997.*
4. *James E.Palmer, David E.Perlman, " Introduction to Digital Systems ", Tata McGraw Hill Publishing Co., Ltd., 1996.*

CS233 System Software **3 0 0 100**

1. INTRODUCTION 9

Basic concepts-Machine structure-Instruction formats-Addressing modes-Typical Architectures.

2. ASSEMBLERS 9

Functions-Features-Machine dependent-Machine independent-Design options-One pass-Multipass-Implementation-Examples.

3. LOADERS AND LINKERS 9

Functions-Features-Relocation-Program Linking-Linking loader implementation-Automatic library search-Loader option-Linkage editors-Dynamic linking-Bootstrap loaders-Examples.

4. MACROPROCESSORS 9

Functions-Macro parameters-Using labels-Conditional macro expansion-Recursive macro expansion-General purpose macro processors-Examples.

5. COMPILERS AND UTILITIES 9

Introduction to Compilers-Different phases of a compiler-Simple one pass compiler-Code optimization techniques-System Software tools-Implementation of editors-Debuggers.

Total No of periods: 45

CS233 System Software **3 0 0 100**

Text Books:

1. *L.Beck, " System Software, An Introduction to System Programming ", Addison Wesley, 1999.*

References:

1. *D.M.Dhamdhere, " Systems Programming and Operating Systems ", Tata McGraw Hill Company, 1999.*
2. *A.V.Aho, Ravi Sethi and J.D.Ullman, " Compilers Principles, Techniques and Tools ", Addison Wesley, 1988.*

CS234 Database Management Systems **3 0 0 100**

1. INTRODUCTION **5**

Database Management Systems-Data views-Architecture-Data models-Data Dictionary-Relational Databases.

2. RELATIONAL APPROACH **8**

Relational Model-Relational Algebra-Query languages-SQL-Embedded SQL.

3. DATABASE DESIGN **12**

Relational database Design-Integrity Constraints-Pitfalls in Design-Functional Dependencies-Normalization-Introduction to ER model-Physical Database organization-Indexing and Hashing.

4. IMPLEMENTATION TECHNIQUES **10**

Query processing-Transaction Processing-Concurrency control-Recovery.

5. CURRENT TRENDS **10**

Commercial database Systems- Distributed Databases-Object Oriented Databases-Object Relational Databases-Data mining and Data Warehousing.

Total No of periods: 45

CS234 Database Management Systems **3 0 0 100**

Text Books:

1. Abraham Silberschatz, Henry F.Korth, S.Sudharshan, " Database System Concepts ", III Edition, Tata McGraw, 1997.

References:

1. Ramez Elmasri, Shamkant B.Navathe, " Fundamentals of Database Systems ", 3rd Edition, Addison Wesley-2000.
2. C.J.Date, " An Introduction to Database Systems ", 7th edition, Addison Wesley, 1997.
3. Raghu Ramakrishnan, " Database Management Systems ", WCB, McGraw Hill, 1998.

EE255	**Electrical Engineering and Control Systems**	**3**	**1**	**0**	**100**

.

1. ELECTRICAL CIRCUITS **9**

Lumped Circuits-Kirchoff's Laws - Simple resistance circuits-Mesh current and Nodel voltage analysis - Phasor and sinusoidal steady state response of R.L & C circuits - Power and Power factor.

2. DC MACHINES AND TRANSFORMERS (QUALITATIVE TREATMENT ONLY) **9**

Principles and operation of single phase transformer - Equivalent circuit - D.C.Machines - Generator and motor load characteristics - simple problems.

3. INDUCTION MOTORS AND SPECIAL MACHINES (QUALITATIVE TREATMENT ONLY) **9**

Single phase Induction Motors - Equivalent Circuit - starting methods - Shaded pole Induction Motor, Stepper Motor, variable reluctance motor and hybrid stepper motors - Applications.

4. CONTROL SYSTEM **9**

Open loop and closed loop systems - Linear and non-linear systems Effects of Feed back - Block diagram reduction techniques - Signal flow graphs.

5. STATE SPACE VARIABLE **9**

State space - State models of physical systems using physical and space variables - Time response of second order systems.

6. TUTORIALS **15**

Total No of periods: 60

EE255 Electrical Engineering and Control Systems **3** **1** **0** **100**

Text Books:

1. *Nagrath, I.J and Kothari, D.P. " Electric Machines ", Tata McGraw-Hill Publishing Company Ltd., 1990.*
2. *I.J.Nagrath, M.Gopal, " Control Systems Engineering ", New Age International(P) Ltd., Publishers, 1996.*

References:

1. *Joseph J Distefand, Allen R.Stuberud Ivan, J.Williams, Schaum's outline series, " Theory and Problems of Feed back and Control Systems", McGraw-Hill Book Company, 1987.*
2. *Ogata K., " Modern Control Engineering ", Prentice Hall of India Pvt.Ltd., New Delhi, 1982.*

MA1201 MATHEMATICS III 3 1 0 100

AIM

The course aims to develop the skills of the students in the areas of boundary value problems and transform techniques. This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory. The course will also serve as a prerequisite for post graduate and specialized studies and research.

OBJECTIVES

At the end of the course the students would

1 Be capable of mathematically formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results.

2 Have gained a well founded knowledge of Fourier series, their different possible forms and the frequently needed practical harmonic analysis that an engineer may have to make from discrete data.

3 Have obtained capacity to formulate and identify certain boundary value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve them and interpret the results.

4 Have grasped the concept of expression of a function, under certain conditions, as a double integral leading to identification of transform pair, and specialization on Fourier transform pair, their properties, the possible special cases with attention to their applications.

5 Have learnt the basics of Z – transform in its applicability to discretely varying functions, gained the skill to formulate certain problems in terms of difference equations and solve them using the Z – transform technique bringing out the elegance of the procedure involved.

UNIT I PARTIAL DIFFERENTIAL EQUATIONS 9 + 3

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solution of standard types of first order partial differential equations – Lagrange's linear equation – Linear partial differential equations of second and higher order with constant coefficients.

UNIT II FOURIER SERIES 9 + 3

Dirichlet's conditions – General Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Complex form of Fourier Series – Parseval's identify – Harmonic Analysis.

UNIT III BOUNDARY VALUE PROBLEMS 9 + 3

Classification of second order quasi linear partial differential equations – Solutions of one dimensional wave equation – One dimensional heat equation – Steady state solution of two-dimensional heat equation (Insulated edges excluded) – Fourier series solutions in Cartesian coordinates.

UNIT IV FOURIER TRANSFORM 9 + 3

Fourier integral theorem (without proof) – Fourier transform pair – Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity.

UNIT V Z -TRANSFORM AND DIFFERENCE EQUATIONS 9 + 3

Z-transform - Elementary properties – Inverse Z – transform – Convolution theorem -Formation of difference equations – Solution of difference equations using Z - transform.

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. Grewal, B.S., “Higher Engineering Mathematics”, Thirty Sixth Edition, Khanna Publishers, Delhi, 2001.
2. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., “Engineering Mathematics Volume III”, S. Chand & Company ltd., New Delhi, 1996.
3. Wylie C. Ray and Barrett Louis, C., “Advanced Engineering Mathematics”, Sixth Edition, McGraw-Hill, Inc., New York, 1995.

REFERENCES

1. Andrews, L.A., and Shivamoggi B.K., “Integral Transforms for Engineers and Applied Mathematicians”, Macmillen , New York ,1988.
2. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., “Advanced Mathematics for Engineering Students”, Volumes II and III, S. Viswanathan (Printers and Publishers) Pvt. Ltd. Chennai, 2002.
3. Churchill, R.V. and Brown, J.W., “Fourier Series and Boundary Value Problems”, Fourth Edition, McGraw-Hill Book Co., Singapore, 1987.

CS1201 DESIGN AND ANALYSIS OF ALGORITHMS 3 1 0 100

AIM

To create analytical skills, to enable the students to design algorithms for various applications, and to analyze the algorithms.

OBJECTIVES

- To introduce basic concepts of algorithms
- To introduce mathematical aspects and analysis of algorithms
- To introduce sorting and searching algorithms
- To introduce various algorithmic techniques
- To introduce algorithm design methods

UNIT I BASIC CONCEPTS OF ALGORITHMS 8

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.

UNIT II MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS 8

Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

UNIT III ANALYSIS OF SORTING AND SEARCHING ALGORITHMS 10

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching – Divide and conquer – Merge sort – Quick Sort – Binary Search – Binary tree- Traversal and Related Properties – Decrease and Conquer – Insertion Sort – Depth first Search and Breadth First Search.

UNIT IV ALGORITHMIC TECHNIQUES 10

Transform and conquer – Presorting – Balanced Search trees – AVL Trees – Heaps and Heap sort – Dynamic Programming – Warshall's and Floyd's Algorithm – Optimal Binary Search trees – Greedy Techniques – Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman trees.

UNIT V ALGORITHM DESIGN METHODS 9

Backtracking – n-Queen's Problem – Hamiltonian Circuit problem – Subset-Sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem.

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.

REFERENCES

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt. Ltd., 2001
2. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis", Pearson Education Asia, 2003.
3. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis Of Computer Algorithms", Pearson Education Asia, 2003.

CS1202 DIGITAL PRINCIPLES AND SYSTEM DESIGN 3 1 0 100

AIM

To provide an in-depth knowledge of the design of digital circuits and the use of Hardware Description Language in digital system design.

OBJECTIVES

- To understand different methods used for the simplification of Boolean functions
- To design and implement combinational circuits
- To design and implement synchronous sequential circuits
- To design and implement asynchronous sequential circuits
- To study the fundamentals of VHDL / Verilog HDL

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 8

Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems - Boolean functions – Simplifications of Boolean functions using Karnaugh map and tabulation methods – Logic gates

UNIT II COMBINATIONAL LOGIC 9

Combinational circuits – Analysis and design procedures - Circuits for arithmetic operations - Code conversion – Introduction to Hardware Description Language (HDL)

UNIT III DESIGN WITH MSI DEVICES 8

Decoders and encoders - Multiplexers and demultiplexers - Memory and programmable logic - HDL for combinational circuits

UNIT IV SYNCHRONOUS SEQUENTIAL LOGIC 10

Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters - HDL for sequential logic circuits, Shift registers and counters.

UNIT V ASYNCHRONOUS SEQUENTIAL LOGIC 10

Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race-free state assignment – Hazards.

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. M.Morris Mano, “Digital Design”, 3rd edition, Pearson Education, 2002.

REFERENCES

1. Charles H.Roth, Jr. “Fundamentals of Logic Design”, 4th Edition, Jaico Publishing House, 2000.
2. Donald D.Givone, “Digital Principles and Design”, Tata McGraw-Hill, 2003.

CS1203 SYSTEM SOFTWARE 3 0 0 100

AIM

To have an understanding of foundations of design of assemblers, loaders, linkers, and macro processors.

OBJECTIVES

- To understand the relationship between system software and machine architecture.
- To know the design and implementation of assemblers
- To know the design and implementation of linkers and loaders.
- To have an understanding of macroprocessors.
- To have an understanding of system software tools.

UNIT I INTRODUCTION 8

System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II ASSEMBLERS 10

Basic assembler functions - A simple SIC assembler – Assembler algorithm and data structures - Machine dependent assembler features - Instruction formats and addressing modes – Program relocation - Machine independent assembler features - Literals – Symbol-defining statements – Expressions - One pass assemblers and Multi pass assemblers - Implementation example - MASM assembler.

UNIT III LOADERS AND LINKERS 9

Basic loader functions - Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader - Machine-independent loader features - Automatic Library Search – Loader Options - Loader design options - Linkage Editors – Dynamic Linking – Bootstrap Loaders - Implementation example - MSDOS linker.

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UNIT IV MACRO PROCESSORS 9

Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and data structures - Machine-independent macro processor features - Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters-Macro within Macro-Implementation example - MASM Macro Processor – ANSI C Macro language.

UNIT V SYSTEM SOFTWARE TOOLS 9

Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other parts of the system – User-Interface Criteria.

TOTAL : 45

TEXT BOOK

1. Leland L. Beck, “System Software – An Introduction to Systems Programming”, 3rd Edition, Pearson Education Asia, 2000.

REFERENCES

1. D. M. Dhamdhere, “Systems Programming and Operating Systems”, Second Revised Edition, Tata McGraw-Hill, 1999.
2. John J. Donovan “Systems Programming”, Tata McGraw-Hill Edition, 1972.

CS1204 OBJECT ORIENTED PROGRAMMING 3 0 0 100

AIM

To present the concept of object oriented programming and discuss the important elements of C++ and Java.

OBJECTIVES

Since C++ and Java play a predominant role in software development it is felt that the following objectives can be achieved after studying this subject.

i) Understand the concepts of Object oriented Programming.
ii) Write simple applications using C++ and Java.
iii) Compare and contrast features of C++ and Java.

UNIT I INTRODUCTION 8

Object-oriented paradigm, elements of object oriented programming – Merits and demerits of OO methodology – C++ fundamentals – data types, operators and expressions, control flow, arrays, strings, pointers and functions.

UNIT II PROGRAMMING IN C++ 10

Classes and objects – constructors and destructors, operator overloading – inheritance, virtual functions and polymorphism

UNIT III FILE HANDLING 9

C++ streams – console streams – console stream classes-formatted and unformatted console I/O operations, manipulators - File streams - classes file modes file pointers and manipulations file I/O – Exception handling

UNIT IV JAVA INTRODUCTION 9

An overview of Java, data types, variables and arrays, operators, control statements, classes, objects, methods – Inheritance.

UNIT V JAVA PROGRAMMING 9

Packages and Interfaces, Exception handling, Multithreaded programming, Strings, Input /Output.

TOTAL : 45

TEXT BOOKS

1. K.R.Venugopal, Rajkumar Buyya, T.Ravishankar, "Mastering C++", TMH, 2003 (Unit I, Unit II, Unit III)
2. Herbert Schildt, "the Java 2 : Complete Reference", Fourth edition, TMH, 2002 (Unit IV, Unit-V)(Chapters 1-11,13,17)

REFERENCES

1. Ira Pohl, “Object oriented programming using C++”, Pearson Education Asia, 2003
2. Bjarne Stroustrup, “The C++ programming language”, Addison Wesley, 2000
3. John R.Hubbard, “Progranning with C++”, Schaums outline series, TMH, 2003
4. H.M.Deitel, P.J.Deitel, “Java : how to program”, Fifth edition, Prentice Hall of India private limited.
5. E.Balagurusamy “ Object Oriented Programming with C++”, TMH 2/e

GE1301 PROFESSIONAL ETHICS AND HUMAN VALUES 3 0 0 100

OBJECTIVE

91 To create an awareness on Engineering Ethics and Human Values.
92 To instill Moral and Social Values and Loyalty
93 To appreciate the rights of Others

1. HUMAN VALUES 10

Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality

2. ENGINEERING ETHICS 9

Senses of 'Engineering Ethics' - variety of moral issued - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories.

3. ENGINEERING AS SOCIAL EXPERIMENTATION 9

Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study

4. SAFETY, RESPONSIBILITIES AND RIGHTS 9

Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile island and chernobyl case studies.
Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights - Intellectual Property Rights (IPR) - discrimination.

5. GLOBAL ISSUES 8

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

TOTAL : 45

TEXT BOOK

1. Mike Martin and Roland Schinzinger, “Ethics in Engineering”, McGraw-Hill, New York 1996.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, “Engineering Ethics”, Prentice Hall of India, New Delhi, 2004.

REFERENCES

1. Charles D. Fleddermann, “Engineering Ethics”, Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint)
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, “Engineering Ethics – Concepts and Cases”, Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available)
3. John R Boatright, “Ethics and the Conduct of Business”, Pearson Education, New Delhi, 2003.
4. Edmund G Seebauer and Robert L Barry, “Fundamentals of Ethics for Scientists and Engineers”, Oxford University Press, Oxford, 2001.

CS1205 OBJECT ORIENTED PROGRAMMING LAB EXPERIMENTS 0 0 3 100

C++

1. Programs Using Functions
   - Functions with default arguments
   - Implementation of Call by Value, Call by Address and Call by Reference

2. Simple Classes for understanding objects, member functions and Constructors
   - Classes with primitive data members
   - Classes with arrays as data members
   - Classes with pointers as data members – String Class
   - Classes with constant data members
   - Classes with static member functions
3. Compile time Polymorphism
   - Operator Overloading including Unary and Binary Operators.
   - Function Overloading
4. Runtime Polymorphism
   - Inheritance
   - Virtual functions
   - Virtual Base Classes
   - Templates
5. File Handling
   - Sequential access
   - Random access

JAVA

6. Simple Java applications
   - for understanding reference to an instance of a class (object), methods
   - Handling Strings in Java
7. Simple Package creation.
   - Developing user defined packages in Java
8. Interfaces
   - Developing user-defined interfaces and implementation
   - Use of predefined interfaces
9. Threading
   - Creation of thread in Java applications
   - Multithreading
10. Exception Handling Mechanism in Java
    - Handling pre-defined exceptions
    - Handling user-defined exceptions

CS1206 DIGITAL LABORATORY 0 0 3 100

LIST OF EXPERIMENTS

1. Verification of Boolean theorems using digital logic gates
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices
4. Design and implementation of parity generator / checker using basic gates and MSI devices
5. Design and implementation of magnitude comparator
6. Design and implementation of application using multiplexers
7. Design and implementation of Shift registers
8. Design and implementation of Synchronous and Asynchronous counters
9. Coding combinational circuits using Hardware Description Language (HDL software required)
10. Coding sequential circuits using HDL (HDL software required)

CS1207 SYSTEM SOFTWARE LAB 0 0 3 100

(Using C or C++)

1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement pass one of a two pass assembler.
3. Implement pass two of a two pass assembler.
4. Implement a single pass assembler.
5. Implement a macro processor.
6. Implement an absolute loader.
7. Implement a relocating loader.
8. Implement pass one of a direct-linking loader.
9. Implement pass two of a direct-linking loader.
10. Implement a simple text editor with features like insertion / deletion of a character, word, sentence.

(For loader exercises, output the snap shot of the main memory as it would be, after the loading has taken place)

MA1252 PROBABILITY AND QUEUEING THEORY 3 1 0 100

AIM

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

OBJECTIVES

At the end of the course, the students would

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

UNIT I PROBABILITY AND RANDOM VARIABLE 9 + 3

Axioms of probability - Conditional probability - Total probability – Baye's theorem- Random variable - Probability mass function - Probability density function - Properties - Moments - Moment generating functions and their properties.

UNIT II STANDARD DISTRIBUTIONS 9 +3

Binomial, Poisson, Geometric, Negative Binomial, Uniform, Exponential, Gamma, Weibull and Normal distributions and their properties - Functions of a random variable.

UNIT III TWO DIMENSIONAL RANDOM VARIABLES 9 + 3

Joint distributions - Marginal and conditional distributions – Covariance - Correlation and regression - Transformation of random variables - Central limit theorem.

UNIT IV RANDOM PROCESSES AND MARKOV CHAINS 9 + 3

Classification - Stationary process - Markov process - Poisson process - Birth and death process - Markov chains - Transition probabilities - Limiting distributions.

UNIT V QUEUEING THEORY 9 + 3

Markovian models – M/M/1, M/M/C , finite and infinite capacity - M/M/∞ queues - Finite source model - M/G/1 queue (steady state solutions only) – Pollaczek – Khintchine formula – Special cases.

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. Ross, S., "A first course in probability", Sixth Edition, Pearson Education, Delhi, 2002.
2. Medhi J., "Stochastic Processes", New Age Publishers, New Delhi, 1994. (Chapters 2, 3, & 4)
3. Taha, H. A., "Operations Research-An Introduction", Seventh Edition, Pearson Education Edition Asia, Delhi, 2002.

REFERENCES

1. Veerarajan., T., "Probability, Statistics and Random Processes", Tata McGraw-Hill, Second Edition, New Delhi, 2003.
2. Allen., A.O., "Probability, Statistics and Queuing Theory", Academic press, New Delhi, 1981.
3. Gross, D. and Harris, C.M., "Fundamentals of Queuing theory", John Wiley and Sons, Second Edition, New York, 1985.

EE1291 ELECTRICAL ENGINEERING AND CONTROL SYSTEMS
PART – A ELECTRICAL ENGINEERING 4 0 0 100

AIM

To expose the students to the basic concept of circuits and machines.

OBJECTIVES

1. To study Kirchoff's laws and be able to do simple problems using mesh and nodal analysis.
2. To study the phasor representation, complex power and three phase circuits and do simple problems.
3. To study qualitatively about the construction and principle of operation of D.C. machines and to do simple problems.
4. To study qualitatively the construction and principle of operation of transformers and three phase induction motors and to do simple problems.
5. To study qualitatively the construction details and principle of operation of single-phase induction motor and special machines.

UNIT I **D.C. CIRCUITS** **6**

Kirchoff's laws – simple resistance circuits – mesh and nodal analysis – simple problems.

UNIT II **A.C. CIRCUITS** **6**

Sinusoidal voltage – RMS ,average and peak values – phasor representation – power factor – single phase RC,RL and RLC circuits – simple series and parallel circuits – complex power – three phase circuits – line and phase values – power measurement – simple problems.

UNIT III **D.C. MACHINES (QUALITATIVE TREATMENT ONLY)** **6**

Constructional details and operating principle of D.C. generators – emf equation – characteristics – principle of operation of D.C. motors – characteristics – starting.

UNIT IV **TRANSFORMERS AND THREE PHASE INDUCTION MOTORS (QUALITATIVE TREATMENT ONLY)** **7**

Constructional details and principle of operation of transformers – emf equation – parameters of transformers – regulation, losses and efficiency - introduction to three phase transformers. constructional details and principle of operation of three phase induction motor – characteristics-starting – losses and efficiency.

UNIT V **SINGLE PHASE INDUCTION MOTORS AND SPECIAL MACHINES (QUALITATIVE TREATMENT)** **5**

Constructional details and principle of operation of single phase induction motors – starting – servomotor, stepper motor, variable reluctance motors.-applications.

L = 30

TEXT BOOK

1. D.P.Kothari and I.J. Nagrath "Basic Electrical Engineering", Tata McGraw Hill Ltd, second edition, 2002.

REFERENCES

1. Stephen J.Chapman "Electrical Machinery Fundamentals", McGraw Hill Publishing Company Ltd, third edition, 1999.
2. K.Murugesh Kumar, "Electric Machines", Vikas Publishing House (P) Ltd, 2002.

PART – B CONTROL SYSTEMS

AIM

1. To expose the students to the basic concepts of control systems.

OBJECTIVES

1. To study control problem, control system dynamics and feedback principles.
2. To study time response of first and second order systems and basic state variable analysis and to do simple problems.
3. To study the concept of stability and criteria for stability and to do simple problems.
4. To study the frequency response through polar plots and Bode plots and Nyquist stability criteria and to do simple problems.
5. To study the different type of control system components.

UNIT I **INTRODUCTION** **6**

The control problem – differential equation of physical systems – control over system dynamics by feedback – regenerative feedback – transfer function – block diagram - algebra – signal flow graphs.

UNIT II **TIME RESPONSE ANALYSIS** **6**

Time response of first and second order system – steady state errors – error constants – design specification of second order systems – state variable analysis – simple problems.

UNIT III **STABILITY** **6**

Concept of stability – stability conditions and criteria – Hurwitz and Routh criterian – relative Stability analysis.

UNIT IV **FREQUENCY RESPONSE** **6**

Correlation between time and frequency response – polar plots , Bode plots – stability in frequency domain using Nyquist stability criterion – simple problems.

UNIT V**CONTROL SYSTEM COMPONENTS** **6**

Control components – servomotors , stepper motor – hydraulic and pneumatic systems.
L = 30 Total = 60

TEXT BOOK

1. I.J.Nagrath and M.Gopal “Control system Engineering” New age International Publishing Company Ltd, third edition 2003.

REFERENCES BOOKS

1. M.Gopal “Control Systems – Principle and Design”, McGraw Hill Publishing Company Ltd, second edition, 2003.
2. Joseph J.Distafeno et-al “Shaums outline series – theory and Problems of Feedback
3. control systems, Tata McGraw Hill publishing company Ltd, 2003.

EXAMINATION PATTERN

In part A there shall be five questions from Electrical Engineering and five questions from control systems (one from each unit). In Part B the compulsory question shall have one part from Electrical Engineering and another from Control Systems. Each of the 'either or' form question shall have an Electrical Engineering part as well as Control Systems part. For example,

Q 12 (a)(i) pertains to Electrical Engineering
12(a)(ii) pertains to Control Systems

Q 12(b)(i) pertains to Electrical Engineering
Q 12(b)(ii) pertains to Control Systems

The other questions shall be set similarly.

EC1291 ANALOG AND DIGITAL COMMUNICATION 3 1 0 100

AIM

To study about the various modulation techniques like amplitude and angle modulation, that is used for data transmission and reception of analog signals and also to understand about the modulation techniques used for digital transmission along with spread spectrum and multiple access techniques.

OBJECTIVES

- To study about the amplitude modulation techniques.
- To study bout the angle modulation techniques.
- To understand about the modulation techniques used for digital data transmission.
- To have the knowledge about the digital communication.
- To study about the spread spectrum and multiple access techniques.

UNIT I AMPLITUDE MODULATION: TRANSMISSION AND RECEPTION 9

Principles of amplitude modulation - AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM power distribution, AM modulator circuits – low level AM modulator, medium power AM modulator, AM transmitters – Low level transmitters, high level transmitters, receiver parameters, AM reception – AM receivers – TRF, super heterodyne receiver, double conversion AM receivers.

UNIT II ANGLE MODULATION: TRANSMISSION AND RECEPTION 9

Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation, phase and frequency modulators and demodulators, frequency spectrum of Angle – modulated waves. Bandwidth requirements for Angle-modulated waves, commercial Broadcast band FM, Average power of an angle-modulated wave, frequency and phase modulators, A direct FM transmitters, Indirect transmitters, Angle modulation Vs amplitude modulation, FM receivers: FM demodulators, PLL FM demodulators, FM noise suppression, frequency verses phase modulation.

UNIT III DIGITAL TRANSMISSION AND DATA COMMUNICATION 9

Introduction, pulse modulation, PCM – PCM sampling, sampling rate, signal to quantization noise rate, companding – analog and digital – percentage error, delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission – ISI, eyepattern, Data communication history, standards, data communication circuits, data communication codes, Error control, Hardware, serial and parallel interfaces, data modems, - Asynchronous modem, Synchronous modem, low-speed modem, medium and high speed modem, modem control.

UNIT IV DIGITAL COMMUNICATION 9

Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying – QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costas loop, DPSK.

UNIT V SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES 9

Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and FDMA, wireless communication systems, source coding of speech for wireless communications.

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. Wayne Tomasi, "Electronic Communication Systems: Fundamentals Through Advanced", Pearson Education, 2001. (UNIT I-IV Chapters- 3,4,6,7,12,13,15).
2. Simon Haykin, "Communication Systems", 4th Edition, John Wiley & Sons., 2001. (Unit V Chapters- 7,8).

REFERENCES

1. Blake, "Electronic Communication Systems", Thomson Delmar Publications, 2002.
2. Martin S.Roden, "Analog and Digital Communication System", 3rd Edition, PHI, 2002.

CS1251 COMPUTER ARCHITECTURE 3 1 0 100

AIM

To discuss the basic structure of a digital computer and to study in detail the organization of the Control unit, the Arithmetic and Logical unit, the Memory unit and the I/O unit.

OBJECTIVES

- To have a thorough understanding of the basic structure and operation of a digital computer.
- To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To study in detail the different types of control and the concept of pipelining.
- To study the hierarchical memory system including cache memories and virtual memory.
- To study the different ways of communicating with I/O devices and standard I/O interfaces.

UNIT I BASIC STRUCTURE OF COMPUTERS 10

Functional units - Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT II ARITHMETIC UNIT 8

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT III BASIC PROCESSING UNIT 9

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Microprogrammed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

UNIT IV MEMORY SYSTEM 9

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

UNIT V I/O ORGANIZATION 9

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition "Computer Organization", McGraw-Hill, 2002.

REFERENCES

1. William Stallings, "Computer Organization and Architecture – Designing for Performance", 6th Edition, Pearson Education, 2003.
2. David A.Patterson and John L.Hennessy, "Computer Organization and Design: The hardware / software interface", 2nd Edition, Morgan Kaufmann, 2002.
3. John P.Hayes, "Computer Architecture and Organization", 3rd Edition, McGraw Hill, 1998.

CS1252 OPERATING SYSTEMS 3 0 0 100

AIM

To have a thorough knowledge of processes, scheduling concepts, memory management, I/O and file systems in an operating system.

OBJECTIVES

- To have an overview of different types of operating systems
- To know the components of an operating system.
- To have a thorough knowledge of process management
- To have a thorough knowledge of storage management
- To know the concepts of I/O and file systems.

UNIT I 9

Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems - Hardware Protection - System Components – Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication.

UNIT II 9

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Critical regions – Monitors.

UNIT III 9

System Model – Deadlock Characterization – Methods for handling Deadlocks -Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks - Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV 9

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

UNIT V 9

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System, Windows

TOTAL : 45

TEXT BOOK

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.

REFERENCES

1. Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education Pvt. Ltd, 2002.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall of India Pvt. Ltd, 2003.
3. William Stallings, “Operating System”, Prentice Hall of India, 4th Edition, 2003.
4. Pramod Chandra P. Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003.

CS1253 VISUAL PROGRAMMING 3 0 0 100

AIM

To make the students to understand the windows programming concepts including Microsoft Foundation Classes

OBJECTIVES

- To introduce the concepts of windows programming
- To introduce GUI programming using Microsoft Foundation Classes
- To enable the students to develop programs and simple applications using Visual C++

UNIT I WINDOWS PROGRAMMING 9

Windows environment – a simple windows program – windows and messages – creating the window – displaying the window – message loop – the window procedure – message processing – text output – painting and repainting – introduction to GDI – device context – basic drawing – child window controls

UNIT II VISUAL C++ PROGRAMMING – INTRODUCTION 9

Application Framework – MFC library – Visual C++ Components – Event Handling – Mapping modes – colors – fonts – modal and modeless dialog – windows common controls – bitmaps

UNIT III THE DOCUMENT AND VIEW ARCHITECTURE 9

Menus – Keyboard accelerators – rich edit control – toolbars – status bars – reusable frame window base class – separating document from its view – reading and writing SDI and MDI documents – splitter window and multiple views – creating DLLs – dialog based applications

UNIT IV ACTIVEX AND OBJECT LINKING AND EMBEDDING (OLE) 9

ActiveX controls Vs. Ordinary Windows Controls – Installing ActiveX controls – Calendar Control – ActiveX control container programming – create ActiveX control at runtime – Component Object Model (COM) – containment and aggregation Vs. inheritance – OLE drag and drop – OLE embedded component and containers – sample applications

UNIT V ADVANCED CONCEPTS 9

Database Management with Microsoft ODBC – Structured Query Language – MFC ODBC classes – sample database applications – filter and sort strings – DAO concepts – displaying database records in scrolling view – Threading – VC++ Networking issues – Winsock – WinInet – building a web client – Internet Information Server – ISAPI server extension – chat application – playing and multimedia (sound and video) files

TOTAL : 45

TEXT BOOKS

1. Charles Petzold, “Windows Programming”, Microsoft press, 1996 (Unit I – Chapter 1-9)
2. David J.Kruglinski, George Shepherd and Scot Wingo, “Programming Visual C++”, Microsoft press, 1999 (Unit II – V)

REFERENCE

1. Steve Holtzner, “Visual C++ 6 Programming”, Wiley Dreamtech India Pvt. Ltd., 2003.

EE1292 Electrical Engineering and Control Systems Laboratory 0 0 3 100

AIM

To expose the students to basic operations of electric circuits, A.C. and D.C. machines and control systems.

1. Verification of Kirchoff's laws

Objectives

1. To study and verify the Kirchoff's current law for simple D.C. circuits.
2. To study and verify kirchoff's voltage law for simple D.C. circuits.

2.Study of RLC series and parallel circuits

Objective

1. To study RL, RC and RLC series and parallel circuits using simple circuits.

3.Open circuit and load characteristics of self-excited DC generator

Objectives

1. To determine induced emf with respect to field excitation of a self excited D.C. generator.
2. To determine residual voltage and the critical field resistance.
3. To determine the terminal voltage with respect to load current.
4. To determine the variation of induced emf with respect to armature current.

4.Load test on D.C. shunt motor

Objectives

1. To obtain the variation of torque, speed, efficiency and line current with respect to the output.
2. To obtain the variation of torque, speed and efficiency with respect to the input line current.
2. To obtain the variation of torque with respect to speed.

5.Speed control of D.C. shunt motor and Swinburne's test

Objectives

1. To obtain the variation of speed with respect to field excitation for a given armature voltage.
2. To obtain the variation of speed with respect to armature voltage for a given field excitation.
3. To determine the constant losses of a D.C. shunt machine.
4. To predetermine the efficiency characteristics when working as a motor and as a generator.

6.Load test on single phase transformer

Objective

1. To determine the variation of efficiency and voltage regulation for a resistance load.

7.Load test on three phase induction motor

Objective

1. To obtain the variation of efficiency, torque, slip, line current and power factor with respect to output.
2. To obtain the variation of efficiency, torque, slip and power factor with respect to line current.
3. To obtain the variation of torque with respect to slip.

8.Load test on single-phase induction motor

Objectives

1. To obtain the variation of efficiency, torque, slip, line current and power factor with respect to output.
2. To obtain the variation of efficiency, torque, slip and power factor with respect to line current.
3. To obtain the variation of torque with respect to slip.

9.Transfer function of separately excited D.C. generator

Objectives

1. To determine the transfer function of a separately excited D.C. generator.
2. To determine resistance and Inductance of the field coil.
3. To study the steady state response for a given step input.

10.Transfer function of armature and field controlled D.C. motor

Objectives

1. To determine transfer function for armature and field controlled D.C. motor.
2. To determine the resistance, inductance of both armature and field.\
3. To determine the torque constant for both methods.
4. To determine the moment of Inertia and friction co-efficient.
5. To study the steady state response for a given step input.

11.Transfer function of A.C. servo motor and compensating network

Objectives

1. To determine the transfer function.
2. To determine the various parameters associated with the transfer function.
3. To study the steady state response for a step input.
4. To derive the transfer function of Lag and Lead compensating networks.
5. To study the steady state response of both the networks for a step input.

P = 45 Total = 45

CS1254 OPERATING SYSTEM LAB 0 0 3 100

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

1. Shell programming
   - command syntax
   - write simple functions
   - basic tests
2. Shell programming
   - loops
   - patterns
   - expansions
   - substitutions
3. Write programs using the following system calls of UNIX operating system:
   fork, exec, getpid, exit, wait, close, stat, opendir, readdir
4. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
5. Write C programs to simulate UNIX commands like ls, grep, etc.
6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
7. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
8. Implement the Producer – Consumer problem using semaphores.
9. Implement some memory management schemes – I
10. Implement some memory management schemes – II

Example for expt 9 & 10 :
Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process-id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process-id, starting byte address and the ending byte address of the allocated space.

When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.

CS1255 VISUAL PROGRAMMING LAB 0 0 3 100

LIST OF EXPERIMENTS

Windows SDK / Visual C++

1. Writing code for keyboard and mouse events.
2. Dialog Based applications
3. Creating MDI applications

Visual C++

4. Threads
5. Document view Architecture, Serialization
6. Dynamic controls
7. Menu, Accelerator, Tool tip, Tool bar
8. Creating DLLs and using them
9. Data access through ODBC
10. Creating ActiveX control and using it

MG1351 PRINCIPLES OF MANAGEMENT 3 0 0 100

(Common to all Branches)

OBJECTIVE

Knowledge on the principles of management is essential for all kinds of people in all kinds of organizations. After studying this course, students will be able to have a clear understanding of the managerial functions like planning, organizing, staffing, leading and controlling. Students will also gain some basic knowledge on international aspect of management.

1. HISTORICAL DEVELOPMENT 9

Definition of Management – Science or Art – Management and Administration – Development of Management Thought – Contribution of Taylor and Fayol – Functions of Management – Types of Business Organisation.

2. PLANNING 9

Nature & Purpose – Steps involved in Planning – Objectives – Setting Objectives – Process of Managing by Objectives – Strategies, Policies & Planning Premises- Forecasting – Decision-making.

3. ORGANISING 9

Nature and Purpose – Formal and informal organization – Organization Chart – Structure and Process – Departmentation by difference strategies – Line and Staff authority – Benefits and Limitations – De-Centralization and Delegation of Authority – Staffing – Selection Process - Techniques – HRD – Managerial Effectiveness.

4. DIRECTING 9

Scope – Human Factors – Creativity and Innovation – Harmonizing Objectives – Leadership – Types of Leadership Motivation – Hierarchy of needs – Motivation theories – Motivational Techniques – Job Enrichment – Communication – Process of Communication – Barriers and Breakdown – Effective Communication – Electronic media in Communication.

5. CONTROLLING 9

System and process of Controlling – Requirements for effective control – The Budget as Control Technique – Information Technology in Controlling – Use of computers in handling the information – Productivity – Problems and Management – Control of Overall Performance – Direct and Preventive Control – Reporting – The Global Environment – Globalization and Liberalization – International Management and Global theory of Management.

TOTAL : 45

TEXT BOOKS

1. Harold Kooritz & Heinz Weihrich “Essentials of Management”, Tata McGraw-Hill, 1998.
2. Joseph L Massie “Essentials of Management”, Prentice Hall of India, (Pearson) Fourth Edition, 2003.

REFERENCES

1 Tripathy PC And Reddy PN, “ Principles of Management”, Tata McGraw-Hill, 1999.
2. Decenzo David, Robbin Stephen A, ”Personnel and Human Reasons Management”, Prentice Hall of India, 1996
3. JAF Stomer, Freeman R. E and Daniel R Gilbert Management, Pearson Education, Sixth Edition, 2004.
4. Fraidoon Mazda, “Engineering Management”, Addison Wesley, 2000.

MA1256 DISCRETE MATHEMATICS 3 1 0 100

AIM

To extend student's mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

OBJECTIVES

At the end of the course, students would

1 Have knowledge of the concepts needed to test the logic of a program.
2 Have gained knowledge which has application in expert system, in data base and a basic for the prolog language.
3 Have an understanding in identifying patterns on many levels.
4 Be aware of a class of functions which transform a finite set into another finite set which relates to input output functions in computer science.
5 Be exposed to concepts and properties of algebraic structures such as semigroups, monoids and groups.

UNIT I PROPOSITIONAL CALCULUS 10 + 3

Propositions – Logical connectives – Compound propositions – Conditional and biconditional propositions – Truth tables – Tautologies and contradictions – Contrapositive – Logical equivalences and implications – DeMorgan's Laws - Normal forms – Principal conjunctive and disjunctive normal forms – Rules of inference – Arguments - Validity of arguments.

UNIT II PREDICATE CALCULUS 9 + 3

Predicates – Statement function – Variables – Free and bound variables – Quantifiers – Universe of discourse – Logical equivalences and implications for quantified statements – Theory of inference – The rules of universal specification and generalization – Validity of arguments.

UNIT III SET THEORY 10 + 3

Basic concepts – Notations – Subset – Algebra of sets – The power set – Ordered pairs and Cartesian product – Relations on sets –Types of relations and their properties – Relational matrix and the graph of a relation – Partitions – Equivalence relations – Partial ordering – Poset – Hasse diagram – Lattices and their properties – Sublattices – Boolean algebra – Homomorphism.

UNIT IV FUNCTIONS **7 + 3**

Definitions of functions – Classification of functions –Type of functions - Examples – Composition of functions – Inverse functions – Binary and n-ary operations – Characteristic function of a set – Hashing functions – Recursive functions – Permutation functions.

UNIT V GROUPS **9 + 3**

Algebraic systems – Definitions – Examples – Properties – Semigroups – Monoids – Homomorphism – Sub semigroups and Submonoids - Cosets and Lagrange's theorem – Normal subgroups – Normal algebraic system with two binary operations - Codes and group codes – Basic notions of error correction - Error recovery in group codes.

TUTORIAL **15**

TOTAL : 60

TEXT BOOKS

1. Trembly J.P and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd, New Delhi, 2003.
2. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, 2002.

REFERENCES

1. Bernard Kolman, Robert C. Busby, Sharan Cutler Ross, "Discrete Mathematical Structures", Fourth Indian reprint, Pearson Education Pvt Ltd., New Delhi, 2003.
2. Kenneth H.Rosen, "Discrete Mathematics and its Applications", Fifth Edition, Tata McGraw – Hill Pub. Co. Ltd., New Delhi, 2003.
3. Richard Johnsonbaugh, "Discrete Mathematics", Fifth Edition, Pearson Education Asia, New Delhi, 2002.

CS1301 DATABASE MANAGEMENT SYSTEMS 3 1 0 100

AIM

To provide a strong foundation in database technology and an introduction to the current trends in this field.

OBJECTIVES

- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To have an introductory knowledge about the emerging trends in the area of distributed DB- OO DB- Data mining and Data Warehousing and XML.

UNIT I INTRODUCTION AND CONCEPTUAL MODELING 9

Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.

UNIT II RELATIONAL MODEL 9

SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependences and Normalization for Relational Databases (up to BCNF).

UNIT III DATA STORAGE AND QUERY PROCESSING 9

Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques – Index Structure for files –Different types of Indexes- B-Tree - B+Tree – Query Processing.

UNIT IV TRANSACTION MANAGEMENT 9

Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control – Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging.

UNIT V CURRENT TRENDS **9**

Object Oriented Databases – Need for Complex Data types- OO data Model- Nested relations- Complex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage – XML – Structure of XML- Data- XML Document- Schema- Querying and Transformation. – Data Mining and Data Warehousing.

TUTORIAL **15**

TOTAL : 60

TEXT BOOKS

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- "Database System Concepts", Fourth Edition, McGraw-Hill, 2002.

REFERENCES

1. Ramez Elmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, "Database Management System", Tata McGraw-Hill Publishing Company, 2003.
3. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- "Database System Implementation"- Pearson Education- 2000.
4. Peter Rob and Corlos Coronel- "Database System, Design, Implementation and Management", Thompson Learning Course Technology- Fifth edition, 2003.

CS1302 COMPUTER NETWORKS 3 0 0 100

AIM

To introduce the concepts, terminologies and technologies used in modern days data communication and computer networking.

OBJECTIVES

- To understand the concepts of data communications.
- To study the functions of different layers.
- To introduce IEEE standards employed in computer networking.
- To make the students to get familiarized with different protocols and network components.

UNIT I DATA COMMUNICATIONS 8

Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.

UNIT II DATA LINK LAYER 10

Error – detection and correction – Parity – LRC – CRC – Hamming code – low Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

UNIT III NETWORK LAYER 10

Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Routers.

UNIT IV TRANSPORT LAYER 9

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

UNIT V APPLICATION LAYER 8

Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

TOTAL : 45

TEXT BOOKS

1. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw-Hill, 2004.

REFERENCES

1. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2003.
2. Larry L.Peterson and Peter S. Davie, “Computer Networks”, Harcourt Asia Pvt. Ltd., Second Edition.

3. Andrew S. Tanenbaum, “Computer Networks”, PHI, Fourth Edition, 2003.
4. William Stallings, “Data and Computer Communication”, Sixth Edition, Pearson Education, 2000.

CS1303 THEORY OF COMPUTATION 3 1 0 100

AIM

To have a introductory knowledge of automata, formal language theory and computability.

OBJECTIVES

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

UNIT I AUTOMATA 9

Introduction to formal proof – Additional forms of proof – Inductive proofs –Finite Automata (FA) – Deterministic Finite Automata (DFA)– Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions.

UNIT II REGULAR EXPRESSIONS AND LANGUAGES 9

Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.

UNIT III CONTEXT-FREE GRAMMAR AND LANGUAGES 9

Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG, Deterministic Pushdown Automata.

UNIT IV PROPERTIES OF CONTEXT-FREE LANGUAGES 9

Normal forms for CFG – Pumping Lemma for CFL - Closure Properties of CFL – Turing Machines – Programming Techniques for TM.

UNIT V UNDECIDABILITY 9

A language that is not Recursively Enumerable (RE) – An undecidable problem that is RE – Undecidable problems about Turing Machine – Post’s Correspondence Problem - The classes P and NP.

TUTORIAL 15

TOTAL : 60

TEXT BOOK

1. J.E.Hopcroft, R.Motwani and J.D Ullman, “Introduction to Automata Theory, Languages and Computations”, Second Edition, Pearson Education, 2003.

REFERENCES

1. H.R.Lewis and C.H.Papadimitriou, “Elements of The theory of Computation”, Second Edition, Pearson Education/PHI, 2003

2. J.Martin, “Introduction to Languages and the Theory of Computation”, Third Edition, TMH, 2003.
3. Micheal Sipser, “Introduction of the Theory and Computation”, Thomson Brokecole, 1997.

CS1304 MICROPROCESSORS AND MICROCONTROLLERS 3 1 0 100

AIM

To have an in depth knowledge of the architecture and programming of 8-bit and 16-bit Microprocessors, Microcontrollers and to study how to interface various peripheral devices with them.

OBJECTIVE

- To study the architecture and Instruction set of 8085 and 8086
- To develop assembly language programs in 8085 and 8086.
- To design and understand multiprocessor configurations
- To study different peripheral devices and their interfacing to 8085/8086.
- To study the architecture and programming of 8051 microcontroller.

UNIT I THE 8085 MICROPROCESSOR 9

Introduction to 8085 – Microprocessor architecture – Instruction set – Programming the 8085 – Code conversion.

UNIT II 8086 SOFTWARE ASPECTS 9

Intel 8086 microprocessor – Architecture – Instruction set and assembler directives – Addressing modes – Assembly language programming – Procedures – Macros – Interrupts and interrupt service routines.

UNIT III 8086 SYSTEM DESIGN 9

8086 signals and timing – MIN/MAX mode of operation – Addressing memory and I/O – Multiprocessor configurations – System design using 8086

UNIT IV I/O INTERFACING 9

Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications.

UNIT V MICROCONTROLLERS 9

Architecture of 8051 – Signals – Operational features – Memory and I/O addressing – Interrupts – Instruction set – Applications.

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. Ramesh S.Gaonkar, “Microprocessor - Architecture, Programming and Applications with the 8085”, Penram International publishing private limited, fifth edition.
(UNIT-1: – Chapters 3,5,6 and programming examples from chapters 7-10)
2. A.K. Ray & K.M.Bhurchandi, “Advanced Microprocessors and peripherals- Architectures, Programming and Interfacing”, TMH, 2002 reprint.
(UNITS 2 to 5: – Chapters 1-6, 7.1-7.3, 8, 16)

REFERENCES

1. Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH, Third edition
2. Yu-cheng Liu, Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design", PHI 2003
3. Mohamed Ali Mazidi, Janice Gillispie Mazidi, "The 8051 microcontroller and embedded systems", Pearson education, 2004.

CS1305 NETWORK LAB 0 0 3 100

(All the programs are to be written using C)

1. Simulation of ARP / RARP.
2. Write a program that takes a binary file as input and performs bit stuffing and CRC Computation.
3. Develop an application for transferring files over RS232.
4. Simulation of Sliding-Window protocol.
5. Simulation of BGP / OSPF routing protocol.
6. Develop a Client – Server application for chat.
7. Develop a Client that contacts a given DNS Server to resolve a given host name.
8. Write a Client to download a file from a HTTP Server.

9 &10 Study of Network Simulators like NS2/Glomosim / OPNET .

CS1306 MICROPROCESSORS AND MICROCONTROLLERS LAB 0 0 3 100

LIST OF EXPERIMENTS

1. Programming with 8085 – 8-bit / 16-bit multiplication/division using repeated addition/subtraction
2. Programming with 8085-code conversion, decimal arithmetic, bit manipulations.
3. Programming with 8085-matrix multiplication, floating point operations
4. Programming with 8086 – String manipulation, search, find and replace, copy operations, sorting. (PC Required)
5. Using BIOS/DOS calls: Keyboard control, display, file manipulation. (PC Required)
6. Using BIOS/DOS calls: Disk operations. (PC Required)
7. Interfacing with 8085/8086 – 8255, 8253
8. Interfacing with 8085/8086 – 8279,8251
9. 8051 Microcontroller based experiments – Simple assembly language programs (cross assembler required).
10. 8051 Microcontroller based experiments – Simple control applications (cross assembler required).

CS1307 DATABASE MANAGEMENT SYSTEMS LAB 0 0 3 100

LIST OF EXPERIMENTS

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High level language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.

CS1351 ARTIFICIAL INTELLIGENCE 3 0 0 100

AIM

Artificial Intelligence aims at developing computer applications, which encompasses perception, reasoning and learning and to provide an in-depth understanding of major techniques used to simulate intelligence.

OBJECTIVE

- To provide a strong foundation of fundamental concepts in Artificial Intelligence
- To provide a basic exposition to the goals and methods of Artificial Intelligence
- To enable the student to apply these techniques in applications which involve perception, reasoning and learning.

UNIT I INTRODUCTION 8

Intelligent Agents – Agents and environments - Good behavior – The nature of environments – structure of agents - Problem Solving - problem solving agents – example problems – searching for solutions – uniformed search strategies - avoiding repeated states – searching with partial information.

UNIT II SEARCHING TECHNIQUES 10

Informed search and exploration – Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments - Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance.

UNIT III KNOWLEDGE REPRESENTATION 10

First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects

UNIT IV LEARNING 9

Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

UNIT V APPLICATIONS 8

Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction - Probabilistic language processing - Probabilistic language models – Information retrieval – Information Extraction – Machine translation.

TOTAL : 45

TEXT BOOK

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

REFERENCES

1. Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw-Hill, 2003.
3. George F. Luger, "Artificial Intelligence-Structures And Strategies For Complex Problem Solving", Pearson Education / PHI, 2002.

CS1352 PRINCIPLES OF COMPILER DESIGN 3 1 0 100

AIM

At the end of the course the student will be able to design and implement a simple compiler.

OBJECTIVES

- To understand, design and implement a lexical analyzer.
- To understand, design and implement a parser.
- To understand, design code generation schemes.
- To understand optimization of codes and runtime environment.

UNIT I INTRODUCTION TO COMPILING 9

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis **–** Role of Lexical Analyzer – Input Buffering – Specification of Tokens.

UNIT II SYNTAX ANALYSIS 9

Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing **–** Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing **–** Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers **–** SLR Parser – Canonical LR Parser – LALR Parser.

UNIT III INTERMEDIATE CODE GENERATION 9

Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.

UNIT IV CODE GENERATION 9

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT V CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS 9

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

TUTORIAL 15

TOTAL : 60

TEXT BOOK

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education Asia, 2003.

REFERENCES

1. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.
2. C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings, 2003.
3. J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill, 2003.
4. Henk Alblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001.
5. Kenneth C. Louden, “Compiler Construction: Principles and Practice”, Thompson Learning, 2003

CS1353 SOFTWARE ENGINEERING 3 0 0 100

AIM

To introduce the methodologies involved in the development and maintenance of software (i.e) over its entire life cycle.

OBJECTIVE

To be aware of

- Different life cycle models
- Requirement dictation process
- Analysis modeling and specification
- Architectural and detailed design methods
- Implementation and testing strategies
- Verification and validation techniques
- Project planning and management
- Use of CASE tools

UNIT I SOFTWARE PROCESS 9

Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

UNIT II SOFTWARE REQUIREMENTS 9

Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping -S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT III DESIGN CONCEPTS AND PRINCIPLES 9

Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems - Real time software design – system design – real time executives – data acquisition system - monitoring and control system. SCM – Need for SCM – Version control – Introduction to SCM process – Software configuration items.

UNIT IV TESTING 9

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging.

UNIT V SOFTWARE PROJECT MANAGEMENT 9

Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking - Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

TOTAL : 45

TEXT BOOK

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International Edition, 5th edition, 2001.

REFERENCES

1. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
2. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
3. James F Peters and Witold Pedryez, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.
4. Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxford University Press, New Delhi, 1996.

CS1354 GRAPHICS AND MULTIMEDIA 3 0 0 100

AIM

To impart the fundamental concepts of Computer Graphics and Multimedia.

OBJECTIVES

- To study the graphics techniques and algorithms.
- To study the multimedia concepts and various I/O technologies.
- To enable the students to develop their creativity

UNIT I OUTPUT PRIMITIVES 9

Introduction - Line - Curve and Ellipse Drawing Algorithms – Attributes – Two-Dimensional Geometric Transformations – Two-Dimensional Clipping and Viewing.

UNIT II THREE-DIMENSIONAL CONCEPTS 9

Three-Dimensional Object Representations – Three-Dimensional Geometric and Modeling Transformations – Three-Dimensional Viewing – Color models – Animation.

UNIT III MULTIMEDIA SYSTEMS DESIGN 9

An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases.

UNIT IV MULTIMEDIA FILE HANDLING 9

Compression & Decompression – Data & File Format standards – Multimedia I/O technologies - Digital voice and audio – Video image and animation – Full motion video – Storage and retrieval Technologies.

UNIT V HYPERMEDIA 9

Multimedia Authoring & User Interface – Hypermedia messaging - Mobile Messaging – Hypermedia message component – Creating Hypermedia message – Integrated multimedia message standards – Integrated Document management – Distributed Multimedia Systems.

TOTAL : 45

TEXT BOOKS

1. Donald Hearn and M.Pauline Baker, “Computer Graphics C Version”, Pearson Education, 2003. (UNIT I : Chapters 1 to 6; UNIT 2: Chapter 9 – 12, 15, 16)
2. Prabat K Andleigh and Kiran Thakrar, “Multimedia Systems and Design”, PHI, 2003. (UNIT 3 to 5)

REFERENCES

1. Judith Jeffcoate, “Multimedia in practice technology and Applications”, PHI, 1998.
2. Foley, Vandam, Feiner, Huges, “Computer Graphics: Principles & Practice”, Pearson Education, second edition 2003.

MA1251 NUMERICAL METHODS 3 1 0 100

AIM

With the present development of the computer technology, it is necessary to develop efficient algorithms for solving problems in science, engineering and technology. This course gives a complete procedure for solving different kinds of problems occur in engineering numerically.

OBJECTIVES

At the end of the course, the students would be acquainted with the basic concepts in numerical methods and their uses are summarized as follows:

91 The roots of nonlinear (algebraic or transcendental) equations, solutions of large system of linear equations and eigenvalue problem of a matrix can be obtained numerically where analytical methods fail to give solution.

92 When huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial to represent the data and to find the intermediate values.

93 The numerical differentiation and integration find application when the function in the analytical form is too complicated or the huge amounts of data are given such as series of measurements, observations or some other empirical information.

94 Since many physical laws are couched in terms of rate of change of one/two or more independent variables, most of the engineering problems are characterized in the form of either nonlinear ordinary differential equations or partial differential equations. The methods introduced in the solution of ordinary differential equations and partial differential equations will be useful in attempting any engineering problem.

UNIT I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9+3

Linear interpolation methods (method of false position) – Newton's method – Statement of Fixed Point Theorem – Fixed point iteration: x=g(x) method – Solution of linear system by Gaussian elimination and Gauss-Jordon methods- Iterative methods: Gauss Jacobi and Gauss-Seidel methods- Inverse of a matrix by Gauss Jordon method – Eigenvalue of a matrix by power method.

UNIT II INTERPOLATION AND APPROXIMATION 9+ 3

Lagrangian Polynomials – Divided differences – Interpolating with a cubic spline – Newton's forward and backward difference formulas.

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION 9+ 3

Derivatives from difference tables – Divided differences and finite differences –Numerical integration by trapezoidal and Simpson's 1/3 and 3/8 rules – Romberg's method – Two and Three point Gaussian quadrature formulas – Double integrals using trapezoidal and Simpson's rules.

UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 9+ 3

Single step methods: Taylor series method – Euler and modified Euler methods – Fourth order Runge – Kutta method for solving first and second order equations – Multistep methods: Milne's and Adam's predictor and corrector methods.

UNIT V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS 9+ 3

Finite difference solution of second order ordinary differential equation – Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. Gerald, C.F, and Wheatley, P.O, "Applied Numerical Analysis", Sixth Edition, Pearson Education Asia, New Delhi, 2002.
2. Balagurusamy, E., "Numerical Methods", Tata McGraw-Hill Pub.Co.Ltd, New Delhi, 1999.

REFERENCES

1. Kandasamy, P., Thilagavathy, K. and Gunavathy, K., "Numerical Methods", S.Chand Co. Ltd., New Delhi, 2003.
2. Burden, R.L and Faires, T.D., "Numerical Analysis", Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002.

CS1355 GRAPHICS AND MULTIMEDIA LAB 0 0 3 100

1. To implement Bresenham's algorithms for line, circle and ellipse drawing
2. To perform 2D Transformations such as translation, rotation, scaling, reflection and sharing.
3. To implement Cohen-Sutherland 2D clipping and window-viewport mapping
4. To perform 3D Transformations such as translation, rotation and scaling.
5. To visualize projections of 3D images.
6. To convert between color models.
7. To implement text compression algorithm
8. To implement image compression algorithm
9. To perform animation using any Animation software
10. To perform basic operations on image using any image editing software

CS1356 COMPILER DESIGN LAB 0 0 3 100

1 & 2 Implement a lexical analyzer in "C".

3. Use LEX tool to implement a lexical analyzer.
4. Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and *.
5. Use YACC and LEX to implement a parser for the same grammar as given in problem
6. Write semantic rules to the YACC program in problem 5 and implement a calculator that takes an expression with digits, + and * and computes and prints its value.

7 & 8. Implement the front end of a compiler that generates the three address code for a simple language with: one data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement.

9 &10. Implement the back end of the compiler which takes the three address code generated in problems 7 and 8, and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used.

MG1401 TOTAL QUALITY MANAGEMENT 3 0 0 100

OBJECTIVE

91 To understand the Total Quality Management concept and principles and the various tools available to achieve Total Quality Management.
92 To understand the statistical approach for quality control.
93 To create an awareness about the ISO and QS certification process and its need for the industries.

1. INTRODUCTION 9

Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership – Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

2. **TQM PRINCIPLES 9**

Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure.

3. **STATISTICAL PROCESS CONTROL (SPC) 9**

The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

4. **TQM TOOLS 9**

Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.

5. **QUALITY SYSTEMS 9**

Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 – Concept, Requirements and Benefits.

TOTAL : 45

TEXT BOOK

1. Dale H.Besterfiled, et al., Total Quality Management, Pearson Education, Inc. 2003. (Indian reprint 2004). ISBN 81-297-0260-6.

REFERENCES

1. James R.Evans & William M.Lidsay, The Management and Control of Quality, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. “Total Quality Management, McGraw-Hill, 1991.
3. Oakland.J.S. “Total Quality Management Butterworth – Hcinemann Ltd., Oxford. 1989.
4. Narayana V. and Sreenivasan, N.S. Quality Management – Concepts and Tasks, New Age International 1996.
5. Zeiri. “Total Quality Management for Engineers Wood Head Publishers, 1991.

CS1401 INTERNET PROGRAMMING 3 0 0 100

AIM

To explain Internet Programming concepts and related programming and scripting languages.

OBJECTIVES

- To describe basic Internet Protocols.
- Explain JAVA and HTML tools for Internet programming.
- Describe scripting languages – Java Script.
- Explain dynamic HTML programming.
- Explain Server Side Programming tools.

UNIT I BASIC NETWORK AND WEB CONCEPTS 9

Internet standards – TCP and UDP protocols – URLs – MIME – CGI – Introduction to SGML.

UNIT II JAVA PROGRAMMING 9

Java basics – I/O streaming – files – Looking up Internet Address - Socket programming – client/server programs – E-mail client – SMTP - POP3 programs – web page retrieval – protocol handlers – content handlers - applets – image handling - Remote Method Invocation.

UNIT III SCRIPTING LANGUAGES 9

HTML – forms – frames – tables – web page design - JavaScript introduction – control structures – functions – arrays – objects – simple web applications

UNIT IV DYNAMIC HTML 9

Dynamic HTML – introduction – cascading style sheets – object model and collections – event model – filters and transition – data binding – data control – ActiveX control – handling of multimedia data

UNIT V SERVER SIDE PROGRAMMING 9

Servlets – deployment of simple servlets – web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – session tracking – cookies – JDBC – simple web applications – multi-tier applications.

TOTAL : 45

TEXT BOOKS

1. Deitel, Deitel and Nieto, “Internet and World Wide Web – How to program”, Pearson Education Publishers, 2000.
2. Elliotte Rusty Harold, “Java Network Programming”, O’Reilly Publishers, 2002

REFERENCES

1. R. Krishnamoorthy & S. Prabhu, “Internet and Java Programming”, New Age International Publishers, 2004.
2. Thomno A. Powell, “The Complete Reference HTML and XHTML”, fourth edition, Tata McGraw Hill, 2003.
3. Naughton, “The Complete Reference – Java2”, Tata McGraw-Hill, 3rd edition, 1999.

CS1402 OBJECT ORIENTED ANALYSIS AND DESIGN 3 1 0 100

AIM

To understand the concepts of object oriented analysis and design.

OBJECTIVES

- To understand the object oriented life cycle.
- To know how to identify objects, relationships, services and attributes through UML.
- To understand the use-case diagrams.
- To know the Object Oriented Design process.
- To know about software quality and usability.

UNIT I INTRODUCTION 8

An Overview of Object Oriented Systems Development - Object Basics – Object Oriented Systems Development Life Cycle.

UNIT II OBJECT ORIENTED METHODOLOGIES 12

Rumbaugh Methodology - Booch Methodology - Jacobson Methodology - Patterns – Frameworks – Unified Approach – Unified Modeling Language – Use case - class diagram - Interactive Diagram - Package Diagram - Collaboration Diagram - State Diagram - Activity Diagram.

UNIT III OBJECT ORIENTED ANALYSIS 9

Identifying use cases - Object Analysis - Classification – Identifying Object relationships - Attributes and Methods.

UNIT IV OBJECT ORIENTED DESIGN 8

Design axioms - Designing Classes – Access Layer - Object Storage - Object Interoperability.

UNIT V SOFTWARE QUALITY AND USABILITY 8

Designing Interface Objects – Software Quality Assurance – System Usability - Measuring User Satisfaction

TUTORIAL 15

TOTAL : 60

TEXT BOOKS

1. Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw-Hill, 1999 (Unit I, III, IV, V).
2. Martin Fowler, “UML Distilled”, Second Edition, PHI/Pearson Education, 2002. (UNIT II)

REFERENCES

1. Stephen R. Schach, “Introduction to Object Oriented Analysis and Design”, Tata McGraw-Hill, 2003.
2. James Rumbaugh, Ivar Jacobson, Grady Booch “The Unified Modeling Language Reference Manual”, Addison Wesley, 1999.
3. Hans-Erik Eriksson, Magnus Penker, Brain Lyons, David Fado, “UML Toolkit”, OMG Press Wiley Publishing Inc., 2004.

IT1252 DIGITAL SIGNAL PROCESSING 3 1 0 100

AIM

To review signals and systems, study DFT and FFT, discuss the design of IIR & FIR filters and study typical applications of digital signal processing.

OBJECTIVES

- To have an overview of signals and systems.
- To study DFT & FFT
- To study the design of IIR filters.
- To study the design of FIR filters.
- To study the effect of finite word lengths & applications of DSP

UNIT I SIGNALS AND SYSTEMS 9

Basic elements of digital signal Processing –Concept of frequency in continuous time and discrete time signals –Sampling theorem –Discrete time signals. Discrete time systems –Analysis of Linear time invariant systems –Z transform –Convolution and correlation.

UNIT II FAST FOURIER TRANSFORMS 9

Introduction to DFT – Efficient computation of DFT Properties of DFT – FFT algorithms – Radix-2 and Radix-4 FFT algorithms – Decimation in Time – Decimation in Frequency algorithms – Use of FFT algorithms in Linear Filtering and correlation.

UNIT III IIR FILTER DESIGN 9

Structure of IIR – System Design of Discrete time IIR filter from continuous time filter – IIR filter design by Impulse Invariance. Bilinear transformation – Approximation derivatives – Design of IIR filter in the Frequency domain.

UNIT IV FIR FILTER DESIGN 9

Symmetric & Antisymteric FIR filters – Linear phase filter – Windowing technique – Rectangular, Kaiser windows – Frequency sampling techniques – Structure for FIR systems.

UNIT V FINITE WORD LENGTH EFFECTS 9

Quantization noise – derivation for quantization noise power – Fixed point and binary floating point number representation – comparison – over flow error – truncation error – co-efficient quantization error - limit cycle oscillation – signal scaling – analytical model of sample and hold operations – Application of DSP – Model of Speech Wave Form – Vocoder.

TUTORIAL 15

TOTAL : 60

TEXT BOOK

1. John G Proakis and Dimtris G Manolakis, “Digital Signal Processing Principles, Algorithms and Application”, PHI/Pearson Education, 2000, 3rd Edition.

REFERENCES

1. Alan V Oppenheim, Ronald W Schafer and John R Buck, “Discrete Time Signal Processing”, PHI/Pearson Education, 2000, 2nd Edition.
2. Johny R.Johnson, “Introduction to Digital Signal Processing”, Prentice Hall of India/Pearson Education, 2002.
3. Sanjit K.Mitra, “Digital Signal Processing: A Computer – Based Approach”, Tata McGraw-Hill, 2001, Second Edition.

CS1403 CASE TOOLS LAB 0 0 3 100

1. Prepare the following documents for two or three of the experiments listed below and develop the software engineering methodology.
2. Program Analysis and Project Planning.
   Thorough study of the problem – Identify project scope, Objectives, Infrastructure.
3. Software requirement Analysis
   Describe the individual Phases / Modules of the project, Identify deliverables.
4. Data Modeling
   Use work products – Data dictionary, Use diagrams and activity diagrams, build and test lass diagrams, Sequence diagrams and add interface to class diagrams.
5. Software Development and Debugging
6. Software Testing
   Prepare test plan, perform validation testing, Coverage analysis, memory leaks, develop test case hierarchy, Site check and Site monitor.

SUGGESTED LIST OF APPLICATIONS

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Payroll System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance
9. Real-Time Scheduler
10. Remote Procedure Call Implementation

CS1404 INTERNET PROGRAMMING LABORATORY 0 0 3 100

LIST OF EXPERIMENTS

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout
3. Write programs in Java to create applets incorporating the following features:
   - Create a color palette with matrix of buttons
   - Set background and foreground of the control text area by selecting a color from color palette.
   - In order to select Foreground or background use check box control as radio buttons
   - To set background images
4. Write programs in Java to do the following.
   - Set the URL of another server.
   - Download the homepage of the server.
   - Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following:
   - HTTP request
   - FTP
   - SMTP
   - POP3
6. Write a program in Java for creating simple chat application with datagram sockets and datagram packets.
7. Write programs in Java using Servlets:
   - To invoke servlets from HTML forms
   - To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets
   - for conducting on-line examination.
   - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
9. Create a web page with the following using HTML
   i) To embed a map in a web page
   ii) To fix the hot spots in that map
   iii) Show all the related information when the hot spots are clicked.
10. Create a web page with the following.
    i) Cascading style sheets.
    ii) Embedded style sheets.
    iii) Inline style sheets.
    iv) Use our college information for the web pages.

IT1402 MOBILE COMPUTING 3 0 0 100

AIM

To provide basics for various techniques in Mobile Communications and Mobile Content services.

OBJECTIVES

- To learn the basics of Wireless voice and data communications technologies.
- To build working knowledge on various telephone and satellite networks.
- To study the working principles of wireless LAN and its standards.
- To build knowledge on various Mobile Computing algorithms.
- To build skills in working with Wireless application Protocols to develop mobile content applications.

UNIT I WIRELESS COMMUNICATION FUNDAMENTALS 9

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

UNIT II TELECOMMUNICATION NETWORKS 11

Telecommunication systems – GSM – GPRS – DECT – UMTS – IMT-2000 – Satellite Networks - Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB - DVB.

UNIT III WIRLESS LAN 9

Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a - 802.11b standards – HIPERLAN – Blue Tooth.

UNIT IV MOBILE NETWORK LAYER 9

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics.

UNIT V TRANSPORT AND APPLICATION LAYERS 7

Traditional TCP – Classical TCP improvements – WAP, WAP 2.0.

TOTAL : 45

TEXT BOOKS

1. Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, Second Edition, 2003. (Unit I Chap 1,2 &3- Unit II chap 4,5 &6-Unit III Chap 7.Unit IV Chap 8- Unit V Chap 9&10.)
2. William Stallings, “Wireless Communications and Networks”, PHI/Pearson Education, 2002. (Unit I Chapter – 7&10-Unit II Chap 9)

REFERENCES

1. Kaveh Pahlavan, Prasanth Krishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, New York, 2003.
3. Hazysztof Wesolowshi, “Mobile Communication Systems”, John Wiley and Sons Ltd, 2002.