MAHARSHI DAYANAND UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
B. TECH. (ELECTRONICS AND COMPUTER ENGG.)
SEMESTER- III

'F' Scheme effective from 2011-12

Sr. No.	Course No.	Course Title	Teaching Schedule				Marks of class work	Examination		Total Marks	Duration Of Exam
			L	T	P	Total		Theory	Practical		
1	EC-311-F	Network theory	3	1	-	4	50	100	-	150	3
2	EC-312-F	Elect. Engg. Material & Semiconductor Device	3	1	-	4	50	100	-	150	3
3	CSE-201-F	Data Structure Using 'C'	3	1	-	4	50	100	-	150	3
4	IT-202-F	Object Oriented Programming Using C++	3	1	-	4	50	100	-	150	3
5	CSE-203-F	Discrete Structures	3	1	-	4	50	100	-	150	3
6	MATH-201-F	Mathematics III	3	2	-	5	50	100	-	150	3
7	EC-316-F	Network theory lab	-	-	2	2	25	-	25	50	3
8	EC-317-F	Elect. Engg. Material & semiconductor Device lab	-	-	2	2	25	-	25	50	3
9	CSE-205-F	Data structure Using 'C' Lab	-	-	2	2	25	-	25	50	3
10	IT-206-F	C++ Programming Lab	-	-	2	2	25	-	25	50	3
		TOTAL	**18**	**7**	**8**	**33**	**400**	**600**	**100**	**1100**	

NOTE:
1. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

MAHARSHI DAYANAND UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
B. TECH. (ELECTRONICS AND COMPUTER ENGG.)
SEMESTER- IV

'F' Scheme effective from 2011-12

Sr. No.	Course No.	Course Title	Teaching Schedule				Marks of class work	Examination		Total Marks	Duration Of Exam
			L	T	P	Total		Theory	Practical		
1	CSE-210-F	Computer Architecture and Organization	3	1	-	4	50	100	-	150	3
2	EC-412-F	Digital Electronics	3	1	-	4	50	100	-	150	3
3	EC-413-F	Analog Communication Systems	3	1	-	4	50	100	-	150	3
4	CSE-208-F	Internet Fundamentals	3	1	-	4	50	100	-	150	3
5	CSE-202-F	Database Management Systems	3	1	-	4	50	100	-	150	3
6	EC-416-F	Digital electronics Lab	-	-	2	2	25	-	25	50	3
7	EC-417-F	Analog Communication System Lab	-	-	2	2	25	-	25	50	3
8	CSE-212-F	Database Management Systems Lab	-	-	3	3	50	-	50	100	3
9	CSE-214-F	Internet Lab	-	-	2	2	25	-	25	50	3
10	GP-202-F	General Proficiency	-	-	2	2	50	-		50	3
		TOTAL	**15**	**5**	**11**	**31**	**425**	**500**	**125**	**1050**	

NOTE:

1. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

2. Each student has to undergo practical training of 6 weeks during summer vacation and its evaluation shall be carried out in the V semester.

MAHARSHI DAYANAND UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
B. TECH. (ELECTRONICS AND COMPUTER ENGG.)
SEMESTER-V

'F' Scheme effective from 2011-12

Sr. No.	Course No.	Course Title	Teaching Schedule				Marks of class work	Examination		Total Marks	Duration Of Exam
			L	T	P	Total		Theory	Practical		
1	EC-511-F	Antenna and Wave Propagation	3	1	-	4	50	100	-	150	3
2	EC-512-F	Microprocessors and Interfacing	3	1	-	4	50	100	-	150	3
3	CSE-301-F	Principles of Operating Systems	3	1	-	4	50	100	-	150	3
4	IC-403-F	Embedded System Design	3	1	-	4	50	100	-	150	3
5	CSE-404-F	Advance JAVA	3	1	-	4	50	100	-	150	3
6	HUM-453-F	Human Resource Management	3	1	-	4	50	100	-	150	3
7	EC-515-F	Microprocessors and Interfacing Lab	-	-	2	2	50	-	50	100	3
8	EC-516-F	Electronic Circuit Simulation Lab	-	-	2	2	50	-	50	100	3
9	CSE-406-F	Advance JAVA Lab	-	-	2	2	50	-	50	100	3
10	EC-517-F	Practical Training	-	-	2	2	100	-		100	
		TOTAL	**18**	**6**	**8**	**32**	**550**	**600**	**150**	**1300**	

NOTE:

1. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

2. Assessment of Practical Training-I, undergone at the end of IV semester, will be based on seminar, viva-voce, report and certificate of practical training obtained by the student from the industry. According to performance letter grades A, B, C, F are to be awarded. A student who is awarded 'F' grade is required to repeat Practical Training.

MAHARSHI DAYANAND UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
B. TECH. (ELECTRONICS AND COMPUTER ENGG.)
SEMESTER-VI

'F' Scheme effective from 2011-12

Sr. No.	Course No.	Course Title	Teaching Schedule				Marks of class work	Examination		Total Marks	Duration Of Exam
			L	T	P	Total		Theory	Practical		
1	EC-611-F	Control System Engineering	3	1	-	4	50	100	-	150	3
2	CSE-302-F	Principles of Software Engineering	3	1	-	4	50	100	-	150	3
3	CSE-206-F	Theory of Automata Computation	3	1	-	4	50	100	-	150	3
4	EC-614-F	Digital Signal Processing	3	1	-	4	50	100	-	150	3
5	EC-615-F	Information Security System	3	1	-	4	50	100	-	150	3
6	IT-305-F	Computer Networks	3	1	-	4	50	100	-	150	3
7	EC-616-F	Control System Lab	-	-	3	3	25	-	25	50	3
8	EC-618-F	Digital Signal Processing Lab	-	-	3	3	25	-	25	50	3
9	GP-CSE-302-F	General Proficiency	-	-	2	2	50	-	-	50	3
		TOTAL	**18**	**6**	**8**	**32**	**400**	**600**	**50**	**1050**	

Note –

1) **Students will be allowed to use non –programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.**
2) **Each student has to undergone practical training of 6 weeks during summer vacation and its evaluation shall be carried out in the VII semester.**

MAHARSHI DAYANAND UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
B. TECH. (ELECTRONICS AND COMPUTER ENGG.)
SEMESTER-VII

'F' Scheme effective from 2011-12

Sr. No.	Course No.	Course Title	Teaching Schedule				Marks of class work	Examination		Total Marks	Duration Of Exam
			L	T	P	Total		Theory	Practical		
1	EC-711-F	System Simulation and Modeling	3	1	-	4	50	100	-	150	3
2	EC-712-F	Compiler Design	3	1	-	4	50	100	-	150	3
3	IT-401-F	Data Warehousing & Data Mining	3	1	-	4	50	100	-	150	3
4		**Elective I***	3	1	-	4	50	100	-	150	3
5	EE-402-F	Wireless Communication	3	1	-	4	50	100	-	150	3
6	EC-715-F	System Simulation and Modeling Lab	-	-	3	3	50	-	50	100	3
7	CSE-411-F	Compiler Design Lab	-	-	3	3	50	-	50	100	3
8	CSE-315-F	Practical Training-II	-	-	2	2	-	-	-	-	3
9	CSE-413-F	Project	-	-	4	4	50	-	50	100	3
		TOTAL	**15**	**5**	**12**	**32**	**400**	**500**	**150**	**1050**	

NOTE:

1. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

2. *Student will be permitted to opt for any one elective run by the other departments. However, the departments will offer only those electives for which they have expertise. The choice of the students for any elective shall not be a binding for the department to offer, if the department does not have expertise.

3. Assessment of Practical Training-I, undergone at the end of IV semester, will be based on seminar, viva-voce, report and certificate of practical training obtained by the student from the industry. According to performance letter grades A, B, C, F are to be awarded. A student who is awarded 'F' grade is required to repeat Practical Training.

4. Project load will be treated as 2 hours per week for Project Coordinator and 1 hour for each participating teacher. Project will commence in VII semester where the students will identify the Project problem, complete the design/procure the

material/start the fabrication/complete the survey etc., depending upon the nature of the problem. Project will continue in VIII semester.

Elective-I

1. PHY-451-F NANO Technology
2. HUM-457-F Business Communication
3. CSE-432-F Digital Image Processing
4. CSIT-401-F Mobile Computing
5. CSIT-402-F Cyber Crime Investigation & Cyber Forensics
6. IT-472-F Introduction to VLSI Design
7. CSE-446-F Natural Language Processing
8. EC-821-F Digital IC Design
9. CSE-407-F Neural Networks

MAHARSHI DAYANAND UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
B. TECH. (ELECTRONICS AND COMPUTER ENGG.)
SEMESTER –VIII

'F' Scheme Effective from 2011-2012

Sr. No.	Course No.	Course Title	Teaching Schedule				Marks of class work	Examination		Total Marks	Duration Of Exam
			L	T	P	Total		Theory	Practical		
1	CSE-305-F	Analysis and Design of Algorithms	3	1	-	4	50	100	-	150	3
2	EC-812-F	Satellite Communication	3	1	-	4	50	100	-	150	3
3		**Elective-1**	3	1	-	4	50	100	-	150	3
4		**Elective-2**	3	1	-	4	50	100	-	150	3
5	EC-815-F	Satellite Communication Lab	-	-	2	4	50	-	50	100	3
6	CSIT-410-F	Seminar	-	-	4	4	50	-	-	50	3
7	CSE-413-F	Project	-	-	8	8	100	-	100	200	3
8	GP-SSE-402-F	General Proficiency	-	-	-	-	-	-	-	-	
		TOTAL	12	4	14	32	400	400	150	950	

NOTE:-

1. Students will be allowed to use the non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

2. A team consisting of Principal/Director, HOD of concerned department and external examiner appointed by University shall carry out the evaluation of the student for his/her General Fitness for the Profession.

3. Project load will be treated as 2 hrs. per week for the project coordinator and 1 hour for each participating teacher. Project involving design, fabrication, testing, computer simulation, case studies etc., which has been commenced by students in VII semester, will be completed in VIII semester.

ELECTIVE-1

1. HUM-451-F Language Skill for Engineers
2. CSE-442-F Human Computer Interaction
3. EC-818-F Telecommunication-Switching and Networks
4. EC-819-F Mixed Signal IC Design
5. EC-820-F Low Power Design
6. EC-722-F Bioinformatics
7. EC-822-F Analog IC Design
8. EC-823-F MEMS

Elective-II

1. CSE-444-F Fuzzy Logic
2. CSIT-404 Parallel Computation & Applications
3. CSE-403-F Software Project Management
4. IT-471-F Management Information System
5. IT-464-F Network Security Management
6. CSE-401-F Advanced Computer Architecture
7. CSE-402-F Distributed Operating Systems
8. CH-453-F Pollution & Control

EE-311-F **NETWORK THEORY**

L	T	P	Class work Marks: 50
3	1	-	Theory Marks : 100
			Total Marks : 150
			Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section- A

TRANSIENT RESPONSE: Transient Response of RC, RL, and RLC Circuits to various excitation signals such as step, ramp, impulse and sinusoidal excitations using Laplace transform.

Section- B

NETWORK FUNCTIONS: Terminal pairs or Ports, Network functions for one-port and two-port networks, poles and zeros of Network functions, Restrictions on pole and zero Locations for driving point functions and transfer functions, Time domain behavior from the pole-zero plot.

Section-C

CHARACTERISTICS AND PARAMETERS OF TWO PORT NETWORKS: Relationship of two-port variables, short-circuit Admittance parameters, open circuit impedance, Parameters, Transmission parameters, hybrid parameters, relationships between parameter sets, Inter-connection of two port networks.

TOPOLOGY: Principles of network topology, graph matrices, network analysis using graph theory.

Section-D

TYPES OF FILTERS AND THEIR CHARACTERISTICS: Filter fundamentals, high-pass, low-pass, band-pass, and band-reject Filters.

NETWORK SYNTHESIS: Positive real functions, synthesis of one port and two port networks, elementary ideas of Active networks.

TEXT BOOKS:

1. Network Analysis & Synthesis: Umesh Sinha; Satya Prakash Pub.
2. Network Analysis & Synthesis: F.F.Kuo; John Wiley & Sons Inc.

REFERENCE BOOKS:

1. Introduction to modern Network Synthesis: Van Valkenburg; John Wiley
2. Network Analysis: Van Valkenburg; PHI
3. Basic circuit theory: Dasoer Kuh; McGraw Hill.
4. A Course in Electrical Circuit Analysis by Soni & Gupta; Dhanpat Rai Publication.
5. Circuit Analysis: G.K. Mithal; Khanna Publication.
6. Networks and Systems: D.Roy Choudhury; New Age International.

EC-312-F **ELECTRICAL ENGINEERING MATERIALS AND SEMICONDUCTOR DEVICES**

L	T	P
3	1	-

Class work Marks : 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

CONDUCTING MATERIALS: Review of energy bands, description of materials, drift velocity, collision time, Mean free path, mobility, conductivity, relaxation time, factors affecting conductivity of materials, types of thermal conductivity, Wiedmann-Franz law, super conductivity, effect of magnetic field, conducting materials, applications.

Section-B

DIELECTRIC MATERIALS: Behaviour of dielectric materials in static electric field, Dipole moments, Polarization, Dielectric constant, Polarizability, Susceptibility, mechanisms of polarization, behavior in alternating field, dielectric loss, loss tangent, types of dielectric & insulating materials, electrostriction, Piezo-electricity, Applications.
MAGNETIC MATERIALS: Permeability, Magnetic susceptibility, magnetic moment, Magnetization, Dipole moment, types of magnetic materials, Magnetostriction, eddy current & hysteresis losses ,applications.

Section-C

SEMICONDUCTORS: Review of Si and Ge as semiconducting materials, Continuity Equation, P-N junction, Drift & Diffusion, Diffusion & Transition capacitances of P-N junction.
CONSTRUCTION AND CHARACTERISTICS OF DEVICES: Brief introduction to Planar Technology for device fabrication, metal -semiconductor junctions (ohmic and non-ohmic), breakdown mechanisms in p-n junction, zener diode, electrical and optical excitation in diodes, LED, solar cells and photo-detectors.

Section-D

BIPOLAR AND MOS DEVICES: BJT, UJT, JFET, MOSFETS
POWER DEVICES: Thyristor, Diac, Triac, GTO, IGBT, VMOS.

TEXT BOOKS:

1. Electrical Engineering Materials: A.J. Dekker; PHI.
2. Solid State Electronic Devices: StreetMan & Banerjee; Pearson.
3. Electronic Devices & Circuits: Millman & Halkias; MGH.

REFERENCE BOOKS:

1. Electrical Engineering Materials: S.P Seth & P.V Gupta; Dhanpat Rai.
2. Text Book of Power Electronics: H.C.Rai; Galgoitia Publications.
3 Electronic Devices & Circuit Theory: Boylestad & Nashelsky; Pearson.
4. Semiconductor devices: Jaspreet Singh; John Wiley.

CSE-201-F **DATA STRUCTURES USING 'C'**
(CSE, EL, ECE, IT, ECE)

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A Overview of C, Introduction, Stacks and Queues

Overview of 'C': Introduction, Flow of Control, Input output functions, Arrays and Structures, Functions.
Data structures and Algorithms: an overview: concept of data structure, choice of right data structures, types of data structures, basic terminology Algorithms, how to design and develop an algorithm: stepwise refinement, use of accumulators and counters; algorithm analysis, complexity of algorithms Big-oh notation.
Arrays: Searching Sorting: Introduction, One Dimensional Arrays, operations defined: traversal, selection, searching, insertion, deletion, and sorting Searching: linear search, binary search; Sorting: selection sort, bubble sort, insertion sort, merge sort, quick sort, shell sort. Multidimensional arrays, address calculation of a location in arrays.
Stacks and queues: Stacks, array representation of stack. Applications of stacks. Queues, Circular queues, array representation of Queues,. Deques, priority queues, Applications of Queues.

Section-B Pointers and Linked Lists

Pointers: Pointer variables, Pointer and arrays, array of pointers, pointers and structures, Dynamic allocation.
Linked Lists: Concept of a linked list,. Circular linked list, doubly linked list, operations on linked lists. Concepts of header linked lists. Applications of linked lists, linked stacks, linked Queues.

Section-C Trees and Graphs

Trees: Introduction to trees, binary trees, representation and traversal of trees, operations on binary trees, types of binary trees, threaded binary trees, B Trees. Application of trees.

Graphs: Introduction, terminology, 'set, linked and matrix' representation, operations on graphs, Applications of graphs.

Section-D Files Handling and Advanced data Structure

Introduction to file handling, Data and Information, File concepts, File organization, files and streams, working with files. AVL trees, Sets, list representation of sets, applications of sets, skip lists

TEXT BOOK:

- Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.
- Data Structures using C by A. K. Sharma, Pearson.

REFERENCE BOOKS:

- Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
- Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
- Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
- Data Structures and Program Design in C By Robert Kruse, PHI,
- Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum's outline by TMH
- Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
- Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.

IT-202 F OBJECT ORIENTED PROGRAMMING USING C++

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A: Introduction to C++ and Object oriented Concepts

C++ Standard Library, Basics of a Typical C++ Environment, Pre-processors Directives, illustrative Simple C++ Programs. Header Files and Namespaces, library files. Introduction to Objects and Object Oriented Programming, Encapsulation (Information Hiding), Access Modifiers: Controlling access to a class, method, or variable (public, protected, private, package), Other Modifiers, Polymorphism: Overloading,, Inheritance, Overriding Methods, Abstract Classes, Reusability, Class's Behaviors.

Section B: Classes and Data Abstraction:

Introduction, Structure Definitions, Accessing Members of Structures, Class Scope and accessing Class Members, Separating Interface from Implementation, Controlling Access Function And Utility Functions, Initializing Class Objects: Constructors, Using Default Arguments With Constructors, Using Destructors, Classes : Const(Constant) Object And Const Member Functions, Object as Member of Classes, Friend Function and Friend Classes, Using This Pointer, Dynamic Memory Allocation with New and Delete, Static Class Members, Container Classes And Integrators, Proxy Classes, Function overloading.

Section C: Operator Overloading, Inheritance, and Virtual Functions and Polymorphism:

Fundamentals of Operator Overloading, Restrictions On Operators Overloading, Operator Functions as Class Members vs. as Friend Functions, Overloading, <<, >> Overloading Unary Operators, Overloading Binary Operators. Introduction to Inheritance, Base Classes And Derived Classes, Protected Members, Casting Base- Class Pointers to Derived- Class Pointers, Using Member Functions, Overriding Base – Class Members in a Derived Class, Public, Protected and Private Inheritance, Using Constructors and Destructors in derived Classes, Implicit Derived –Class Object To Base- Class Object Conversion, Composition Vs. Inheritance. Introduction to Virtual Functions, Abstract Base Classes And Concrete Classes, Polymorphism, New Classes And Dynamic Binding, Virtual Destructors, Polymorphism, Dynamic Binding.

Section D: Files and I/O Streams and Templates and Exception Handling:

Files and Streams, Creating a Sequential Access File, Reading Data From A Sequential Access File, Updating Sequential Access Files, Random Access Files, Creating A Random Access File, Writing Data Randomly To a Random Access File, Reading Data Sequentially from a Random Access File. Stream Input/Output Classes and Objects, Stream Output, Stream Input, Unformatted I/O (with read and write), Stream Manipulators, Stream Format States, Stream Error States.
Function Templates, Overloading Template Functions, Class Template, Class Templates and Non-Type Parameters, Templates and Inheritance, Templates and Friends, Templates and Static Members.
Introduction, Basics of C++ Exception Handling: Try Throw, Catch, Throwing an Exception, Catching an Exception, Rethrowing an Exception, Exception specifications, Processing Unexpected Exceptions, Stack Unwinding, Constructors, Destructors and Exception Handling, Exceptions and Inheritance.

TEXT BOOKS:

- C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall
- Object Oriented Programming in Turbo C++ by Robert Lafore, 1994, The WAITE Group Press.
- Programming with C++ By D Ravichandran, 2003, T.M.H

REFERENCE BOOKS:

- Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw-Hill
- Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley,
- The Complete Reference in C++ By Herbert Schildt, 2002, TMH.

CSE-203-F **DISCRETE STRUCTURES**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A: Set Theory and Propositional Calculus

Introduction to set theory, Set operations, Algebra of sets, Duality, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions , Partial ordering relations and lattices Function and its types, Composition of function and relations, Cardinality and inverse Relations Introduction to propositional Calculus: Basic operations: AND(^), OR(v), NOT(~), Truth value of a compound statement, propositions, tautologies, contradictions.

Section B: Techniques of Counting and Recursion and recurrence Relation

Permutations with and without repetition, Combination. Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

Section C: Algebraic Structures

Definition and examples of a monoid, Semi group, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem

Section D: Section Graphs and Trees

Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Sub graphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eurelian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Trees, Spanning trees, Binary trees and its traversals

TEXT BOOK:

1. Elements of Discrete Mathematics, C.L Liu, 1985, McGraw Hill

REFERENCE BOOKS:

1. Discrete Mathematics by Johnson Bough R., 5th Edition, PEA, 2001..
2. Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.
3. Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press.
4. Applied Discrete Structures for Computer Science, Doerr and Levasseur, (Chicago: 1985, SRA
5. Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold, London,
6. Schaums Outline series: Theory and problems of Probability by S. Lipshutz, 1982, McGraw-Hill Singapore
7. Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI
8. Discrete Mathematical Structures with Applications to Computers by Tembley & Manohar, 1995, Mc Graw Hill.

MATH-201-F MATHEMATICS-III

L T P
3 2 0

Class Work marks: 50
Theory marks: 100
Total marks: 150
Duration of Exam: 3 hr

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Fourier Series and Fourier Transforms : Euler's formulae, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and consine series. Fourier integrals, Fourier transforms, Shifting theorem (both on time and frequency axes) Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem, Fourier transform of Dirac-delta function.

Section-B

Functions of Complex Variable: Definition, Exponential function, Trigonometric and Hyperbolic functions, Logrithmic functions. Limit and Continuity of a function, Differentiability and Analyticity. Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations. Harmonic functions, application to flow problems. Integration of complex functions. Cauchy-Integral theorem and formula.

Section-C

Power series, radius and circle of convergence, Taylor's Maclaurin's and Laurent's series. Zeroes and singularities of complex functions, Residues. Evaluation of real integrals using residues (around unit and semi circle only). Probability Distributions and Hypothesis Testing : Conditional probability, Bayes theorem and its applications, expected value of a random variable. Properties and application of Binomial, Poisson and Normal distributions.

Section D

Testing of a hypothesis, tests of significance for large samples, Student's t-distribution (applications only), Chi-square test of goodness of fit.
Linear Programming: Linear programming problems formulation, Solving linear programming problems using (i) Graphical method (ii) Simplex method (iii) Dual simplex method.

TEXT BOOKS:

1. Engg Mathematics By Babu Ram, Pearson India
2. Advanced Engg. Mathematics : F Kreyszig.
3. Higher Engg. Mathematics : B.S. Grewal.

REFERENCE BOOKS:

1. Advance Engg. Mathematics : R.K. Jain, S.R.K.Iyenger.
2. Advanced Engg. Mathematics : Michael D. Greenberg.
3. Operation Research : H.A. Taha.
4. Probability statistics for Engineers : Johnson and. PHI

EC-316-F NETWORK THEORY LAB

L T P	Theory	: 25 Marks
0 0 2	Class work	: 25 Marks
	Total	: 50 Marks

LIST OF EXPERIMENTS:

1. Transient response of RC circuit.
2. Transient response of RL circuit.
3. To find the resonance frequency, Band width of RLC series circuit.
4. To calculate and verify “Z" parameters of a two port network.
5. To calculate and verify "Y" parameters of a two port network.
6. To determine equivalent parameter of parallel connections of two port network.
7. To plot the frequency response of low pass filter and determine half-power frequency.
8. To plot the frequency response of high pass filters and determines the half-power frequency.
9. To plot the frequency response of band-pass filters and determines the band-width.
10. To calculate and verify "ABCD" parameters of a two port network.
11. To synthesize a network of a given network function and verify its response.
12. Introduction of P-Spice.

NOTE: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

EC-317-F **ELECTRICAL ENGINEERING MATERIALS AND SEMICONDUCTOR DEVICES LAB**

L T P	
0 0 2	

Theory	: 25 Marks
Class work	: 25 Marks
Total	: 50 Marks

LIST OF EXPERIMENTS:

1. To study V-I characteristics of diode, and its use as a capacitance.
2. Study of the characteristics of transistor in Common Base configuration.
3. Study of the characteristics of transistor in Common Emitter configuration.
4. Study of V-I characteristics of a photo-voltaic cell.
5. Study of characteristics of MOSFET/JFET is CS configuration.
6. To plot characteristics of thyristor.
7. To plot characteristics of UJT.
8. To plot characteristics of Diac & Triac.
9. Study of loss factor in a dielectric by an impedance bridge.
10. Study of photo-resist in metal pattern for planar technology/PCB technology.

NOTE: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

CSE-205-F DATA STRUCTURES USING 'C' LAB

L T P		
0 0 2	Class Work Marks:	25
	Exam Marks:	25
	Total Marks:	50
	Duration of exam:	3 hrs

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concepts write programs for finding the element in the array using Binary Search Method
3. Write a program to perform following operations on tables using functions only a) Addition b) Subtraction c) Multiplication d) Transpose
4. Using iteration & recursion concepts write the programs for Quick Sort Technique
5. Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
6. Write a program for swapping of two numbers using 'call by value' and 'call by reference strategies.
7. Write a program to implement binary search tree. (Insertion and Deletion in Binary search Tree)
8. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list
9. Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file.
10. Create a linked list and perform the following operations on it a) add a node b) Delete a node
11. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.
12. Write a program to simulate the various graph traversing algorithms.
13. Write a program which simulates the various tree traversal algorithms.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

IT-206-F **C ++ PROGRAMMING LAB.**

L T P	Class Work Marks:	50
0 0 2	Exam Marks:	50
	Total Marks:	100
	Duration of exam:	3 hrs

Q1. Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called power ( ) that takes a double value for n and an int value for p, and returns the result as double value. Use a default argument of 2 for p, so that if this argument is omitted, the number will be squared. Write a main ( ) function that gets values from the user to test this function.

Q2. A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y coordinates.
Write a program that uses a structure called point to model a point. Define three points, and have the user input values to two of them. Than set the third point equal to the sum of the other two, and display the value of the new point. Interaction with the program might look like this:
Enter coordinates for P1: 3 4
Enter coordinates for P2: 5 7
Coordinates of P1 + P2 are: 8, 11

Q3. Create the equivalent of a four function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally it should display the result. When it finishes the calculation, the program should ask if the user wants to do another calculation. The response can be 'Y' or 'N'. Some sample interaction with the program might
look like this.
Enter first number, operator, second number: 10/ 3
Answer = 3.333333
Do another (Y/ N)? Y
Enter first number, operator, and second number 12 + 100
Answer = 112
Do another (Y/ N)? N

Q4. A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of a phone number separately. Call the structure phone. Create two structure variables of type phone. Initialize one, and have the user input a number for the other one. Then display both numbers. The interchange might look like this:
Enter your area code, exchange, and number: 415 555 1212

My number is (212) 767-8900
Your number is (415) 555-1212

Q5. Create two classes DM and DB which store the value of distances. DM stores distances in metres and centimeters and DB in feet and inches. Write a program that can read values fortheclass objects and add one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results maybe a DM object or DB object, depending on the units in which the results are required. The display should be in the format of feet and inches or metres and cenitmetres depending on the object on display.

Q6. Create a class rational which represents a numerical value by two double values-NUMERATOR & DENOMINATOR. Include the following public member Functions:

- Constructor with no arguments (default).
- Constructor with two arguments.
- void reduce( ) that reduces the rational number by eliminating the highest common factor between the numerator and denominator.
- Overload + operator to add two rational number.
- Overload >> operator to enable input through cin.
- Overload << operator to enable output through cout.
- Write a main ( ) to test all the functions in the class.

Q7. Consider the following class definition

```
class father {
protected : int age;
public;
father (int x) {age = x;}
virtual void iam ( )
{ cout < < "I AM THE FATHER, my age is : "<< age<< end1:}
};
```

Derive the two classes son and daughter from the above class and for each, define iam ( ) to write our similar but appropriate messages. You should also define suitable constructors for these classes.

Now, write a main ( ) that creates objects of the three classes and then calls iam ( ) for them. Declare pointer to father. Successively, assign addresses of objects of the two derived classes to this pointer and in each case, call iam ( ) through the pointer to demonstrate polymorphism in action.

Q8. Write a program that creates a binary file by reading the data for the students from the terminal. The data of each student consist of roll no., name (a string of 30 or lesser no. of characters) and marks.

Q9. A hospital wants to create a database regarding its indoor patients. The information to store include

a) Name of the patient
b) Date of admission
c) Disease
d) Date of discharge

Create a structure to store the date (year, month and date as its members). Create a base class to store the above information. The member function should include functions to enter information and display a list of all the patients in the database. Create a derived class to store the age of the patients. List the information about all the to store the age of the patients. List the information about all the pediatric patients (less than twelve years in age).

Q10. Make a class **Employee** with a name and salary. Make a class **Manager** inherit from **Employee**. Add an instance variable, named department, of type string. Supply a method to **toString** that prints the manager's name, department and salary. Make a class **Executive** inherit from **Manager**. Supply a method **to String** that prints the string **"Executive"** followed by the information stored in the **Manager** superclass object. Supply a test program that tests these classes and methods.

Q11. Imagine a tollbooth with a class called toll Booth. The two data items are a type unsigned int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both these to 0. A member function called payingCar ( ) increments the car total and adds 0.50 to the cash total. Another function, called nopayCar ( ), increments the car total but adds nothing to the cash total. Finally, a member function called displays the two totals. Include a program to test this class. This program should allow the user to push one key to count a paying car, and another to count a nonpaying car. Pushing the ESC kay should cause the program to print out the total cars and total cash and then exit.

Q12. Write a function called reversit ( ) that reverses a string (an array of char). Use a for loop that swaps the first and last characters, then the second and next to last characters and so on. The string should be passed to reversit ( ) as an argument. Write a program to exercise reversit ( ). The program should get a string from the user, call reversit ( ), and print out the result. Use an input method that allows embedded blanks. Test the program with Napoleon's famous phrase, "Able was I ere I saw Elba)".

Q13. Create some objects of the string class, and put them in a Deque-some at the head of the Deque and some at the tail. Display the contents of the Deque using the forEach ( ) function and a user written display function. Then search the Deque for a particular string, using the first That ( ) function and display any strings that match. Finally remove all the items from the Deque using the getLeft ( ) function and display each item. Notice the order in which the items are displayed: Using getLeft ( ), those inserted on the left (head) of the Deque are removed in "last in first out" order while those put on the right side are removed in "first in first out" order. The opposite would be true if getRight ( ) were used.

Q14. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data ( ) to initialize base class data members and another member function display_area ( ) to compute and display the area of figures. Make display_area ( ) as a virtual function and redefine this function in the derived classes to suit their requirements. Using these three

classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area. Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles and used as follows:
Area of rectangle = x * y
Area of triangle = ½ * x * y

CSE-210-F COMPUTER ARCHITECTURE & ORGANIZATION

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

Boolean algebra and Logic gates, Combinational logic blocks(Adders, Multiplexers, Encoders, de-coder), Sequential logic blocks(Latches, Flip-Flops, Registers, Counters) Store program control concept, Flynn's classification of computers (SISD, MISD, MIMD); Multilevel viewpoint of a machine: digital logic, micro architecture, ISA, operating systems, high level language; structured organization; CPU, caches, main memory, secondary memory units & I/O; Performance metrics; MIPS, MFLOPS.

Section B: Instruction Set Architecture

Instruction set based classification of processors (RISC, CISC, and their comparison); addressing modes: register, immediate, direct, indirect, indexed; Operations in the instruction set; Arithmetic and Logical, Data Transfer, Control Flow; Instruction set formats (fixed, variable, hybrid); Language of the machine: 8086 ; simulation using MSAM.

Section C: Basic non pipelined CPU Architecture and Memory Hierarchy & I/O Techniques

CPU Architecture types (accumulator, register, stack, memory/ register) detailed data path of a typical register based CPU, Fetch-Decode-Execute cycle (typically 3 to 5 stage); microinstruction sequencing, implementation of control unit, Enhancing performance with pipelining. The need for a memory hierarchy (Locality of reference principle, Memory hierarchy in practice: Cache, main memory and secondary memory, Memory parameters: access/ cycle time, cost per bit); Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations.

Section D: Introduction to Parallelism and Computer Organization [80x86]

Goals of parallelism (Exploitation of concurrency, throughput enhancement); Amdahl's law; Instruction level parallelism (pipelining, super scaling –basic features); Processor level parallelism (Multiprocessor systems overview).

Instruction codes, computer register, computer instructions, timing and control, instruction cycle, type of instructions, memory reference, register reference. I/O reference, Basics of Logic Design, accumulator logic, Control memory, address sequencing, micro-instruction formats, micro-program sequencer, Stack Organization, Instruction Formats, Types of interrupts; Memory Hierarchy.

TEXT BOOKS:

1. Computer Organization and Design, 2nd Ed., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.
2. Computer Architecture and Organization, 3rd Edi, by John P. Hayes, 1998, TMH.

REFERENCE BOOKS:

1. Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall Upper Saddle River, New Jersey
2. Computer Organization, 5th Edi, by Carl Hamacher, Zvonko Vranesic,2002, Safwat Zaky.
3. Structured Computer Organisation by A.S. Tanenbaum, 4th edition, Prentice-Hall of India, 1999, Eastern Economic Edition.
4. Computer Organisation & Architecture: Designing for performance by W. Stallings, 4th edition, 1996, Prentice-Hall International edition.
5. Computer System Architecture by M. Mano, 2001, Prentice-Hall.
6. Computer Architecture- Nicholas Carter, 2002, T.M.H.

EC-412-F **DIGITAL ELECTRONICS**

L T P	Class work Marks: 50
3 1 -	Theory Marks : 100
	Total Marks : 150
	Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section- A

FUNDAMENTALS OF DIGITAL TECHNIQUES: Digital signal, logic gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, Boolean algebra. Review of Number systems. Binary codes: BCD, Excess-3, Gray, EBCDIC, ASCII, Error detection and correction codes. **COMBINATIONAL DESIGN USING GATES:** Design using gates, Karnaugh map and Quine Mcluskey methods of simplification.

Section-B

COMBINATIONAL DESIGN USING MSI DEVICES Multiplexers and Demultiplexers and their use as logic elements, Decoders, Adders / Subtractors, BCD arithmetic circuits, Encoders, Decoders / Drivers for display devices.

SEQUENTIAL CIRCUITS: Flip Flops : S-R, J-K, T, D, master-slave, edge triggered, shift registers, sequence generators, Counters, Asynchronous and Synchronous Ring counters and Johnson Counter, Design of Synchronous and Asynchronous sequential circuits.

Section-C

DIGITAL LOGIC FAMILIES: Switching mode operation of p-n junction, bipolar and MOS. devices. Bipolar logic families: RTL, DTL, DCTL, HTL, TTL, ECL, MOS, and CMOS logic families. Tristate logic, interfacing of CMOS and TTL families.

Section-D

A/D AND D/A CONVERTER: Sample and hold circuit, weighted resistor and R -2 R ladder D/A Converters, specifications for D/A converters. A/D converters: Quantization, parallel - comparator, successive approximation, counting type, dual-slope ADC, specifications of ADCs.

PROGRAMMABLE LOGIC DEVICES: ROM, PLA, PAL, FPGA and CPLDs.

TEXT BOOK:

1. Modern Digital Electronics (Edition III): R. P. Jain; TMH

REFERENCE BOOKS:

1. Digital Integrated Electronics: Taub & Schilling; MGH
2. Digital Principles and Applications: Malvino & Leach; McGraw Hill.
3. Digital Design: Morris Mano; PHI.

EC-413-F ANALOG COMMUNICATION SYSTEM

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section- A

Analog Modulation Techniques: Introduction, Theory of Amplitude Modulation; AM Power Calculations, AM Modulation with a Complex wave, Theory of Frequency Modulation (FM); Spectra of FM Signals, Narrow Band and Wide Band FM, Theory of Phase Modulation, Comparison of AM and FM, Comparison of PM and FM, Noise and Frequency Modulation, Pre-emphasis and De-emphasis.

Section-B

AM Transmission/AM Reception: Introduction, Generation of Amplitude Modulation, Basic Principles of AM Generation; Square law Diode Modulation, Vander Bijl Modulation, Suppressed Carrier AM Generation, Ring Modulator, Balanced Modulator. Tuned Radio Frequency (TRF) Receiver, Basic Elements of AM Super-heterodyne receiver; RF Amplifiers Characteristics-Sensitivity, Selectivity, Image Frequency Rejection, Mixers Tracking and Alignment, Local Oscillator, IF Amplifier, AM Detectors; Envelope or Diode Detector, AGC, AM Receiver using Transistors Communication Receiver.

Section-C

FM Transmission/FM Reception: Generation of FM by Direct Methods. Indirect Generation of FM; the Armstrong Method, FM Stereo Transmission.FM Receiver Direct Methods of Frequency Demodulation. Slope Detector, Travis Detector Foster Seely or Phase Discriminator, Indirect methods of FM Demodulation; FM Detector using PLL and Stereo FM Multiplex Reception.

Section-D

SSB Transmission/SSB Reception: Advantages of SSB transmission, Generation of SSB; Independent Side-Band Systems (ISB), Vestigial Side-Band Modulation (VSB).SSB Product Demodulator, Balanced Modulator as SSB Demodulator, ISB/Suppressed Carrier Receiver.

Pulse Modulation Transmission and Reception: Introduction, Pulse Amplitude Modulation (PAM), PAM Modulator Circuit, Demodulation of PAM Signals, Pulse Time Modulation (PTM); Pulse Width Modulation (PWM), Pulse Position Modulation (PPM), PPM Demodulator. FSK, PSK.

REFRENCE BOOKS:

1. George Kennedy, “Electronic Communication System”, 4th edition, McGraw- Hill (2000).
2. Gary M. Miller and Jeffery S. Beasley, “Modern Electronic Communications “, 7/e PHI.
3. Simon Haykin, “Communication Systems”, 8th edition, Wiley Pubclishers.
4. Wayne Tomasi, “Electronics Communication systems”, 4thEdition, Pearson Publishers.
5. Proakis,’Communication Systems”, 4th Edition, McGraw-Hill Publications.

CSE-208-F **INTERNET FUNDAMENTALS**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A: Electronic Mail and Internet:

Introduction, advantages and disadvantages, Userids, Pass words, e-mail addresses, message components, message composition, mailer features, E-mail inner workings, E-mail management, Mime types, Newsgroups, mailing lists, chat rooms. Introduction to networks and internet, history, working of Internet, Internet Congestion, internet culture, business culture on internet. Collaborative computing & the internet. Modes of Connecting to Internet, Internet Service Providers(ISPs), Internet address, standard address, domain name, DNS, IP.v6.Modems and time continuum, communications software; internet tools.

Section B: World Wide Web:

Introduction, Miscellaneous Web Browser details, searching the www: Directories search engines and Meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP. Introduction to Browser, Coast-to-coast surfing, hypertext markup language, Web page installation, Web page setup, Basics of HTML & formatting and hyperlink creation. Using FrontPage Express, Plug-ins.

Section C: Languages:

Basic and advanced HTML, java script language, Client and Server Side Programming in java script. Forms and data in java script, XML basics. Introduction to Web Servers: PWS, IIS, Apache; Microsoft Personal Web Server. Accessing & using these servers.

Section D: Privacy and security topics:

Introduction, Software Complexity, Encryption schemes, Secure Web document, Digital Signatures, Firewalls.

TEXT BOOK:

- Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, TMH
- Internet & World Wide Programming, Deitel, Deitel & Nieto, 2000, Pearson Education

REFERENCE BOOKS:

- Complete idiots guide to java script,. Aron Weiss, QUE, 1997
- Network firewalls, Kironjeet syan -New Rider Pub.
- www.secinf.com
- www.hackers.com
- Alfred Glkossbrenner-Internet 101 Computing MGH, 1996

CSE-202-F **DATABASE MANAGEMENT SYSTEMS**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A: Introduction, Client Server Arch., E-R Diagram and Keys

Overview of database Management System; Various views of data, data Models, Introduction to Database Languages. Advantages of DBMS over file processing systems, Responsibility of
Database Administrator, Introduction to Client/Server architecture, Three levels architecture of Database Systems, ER Diagram (Entity Relationship), mapping Constraints, Keys, Reduction of E-R diagram into tables.

Section B: File Organization and Relational Model and Calculus

Sequential Files, index sequential files, direct files, Hashing, B-trees Index files.Relational Model, Relational Algebra & various operations, Relational and Tuple calculus.

Section C: Introduction to Query Languages

QLB, QBE, Structured query language – with special reference of (SQL of ORACLE), integrity constraints, functional dependencies & NORMALISATION – (up to 4th Normal forms), BCNF (Boyce – code normal forms)

Section D

Introduction to Distributed Data processing, parallel Databases, data mining & data warehousing, network model & hierarchical model, Introduction to transaction, properties of transaction and life cycle of transaction, Introduction to Concurrency control and Recovery systems., need of concurrency control and recovery system, problems in concurrent transactions.

TEXT BOOKS:

1. Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition.
2. Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub.

REFERENCE BOOKS:

1. Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3rd edition, 2000, Addision-Wesley, Low Priced Edition.
2. An Introduction to Database Systems by C.J. Date, 7th edition, Addison-Wesley, Low Priced Edition, 2000.
3. Database Management and Design by G.W. Hansen and J.V. Hansen, 2nd edition, 1999, Prentice-Hall of India, Eastern Economy Edition.
4. Database Management Systems by A.K. Majumdar and P. Bhattacharyya, 5th edition, 1999, Tata McGraw-Hill Publishing.
5. A Guide to the SQL Standard, Date, C. and Darwen,H. 3rd edition, Reading, MA: 1994, Addison-Wesley.
6. Data Management & file Structure by Looms, 1989, PHI

EC-416-F DIGITAL ELECTRONICS LAB

L T P	Theory : 25 Marks
0 0 2	Class work : 25 Marks
	Total : 50 Marks

LIST OF EXPERIMENTS:

1. Study of TTL gates AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.
2. Design & realize a given function using K-maps and verify its performance.
3. To verify the operation of multiplexer & Demultiplexer.
4. To verify the operation of comparator.
5. To verify the truth tables of S-R, J-K, T & D type flip flops.
6. To verify the operation of bi-directional shift register.
7. To design & verify the operation of 3-bit synchronous counter.
8. To design and verify the operation of synchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
9. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.
10. To design & realize a sequence generator for a given sequence using J-K flip-flops.
11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
12. Design a 4-bit shift-register and verify its operation. Verify the operation of a ring counter and a Johnson counter.

NOTE: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

EC-417-F ANALOG COMMUNICATION SYSTEM LAB

L T P	Theory : 25 Marks
0 0 2	Class work : 25 Marks
	Total : 50 Marks

LIST OF EXPERIMENTS:

1. To study Amplitude Modulation using a transistor and determine depth of modulation.
2. To study envelope detector for demodulation of AM signal and observe diagonal peak clipping effect.
3. Frequency Modulation using Voltage Controlled Oscillator.
4. Generation of DSB-SC signal using Balanced Modulator.

NOTE: Ten experiments are to be performed. Remaining experiments may either be designed & set by the concerned institution as per the scope of the syllabus.

CSE- 212-F DATABASE MANAGEMENT SYSTEMS LAB

L T P		
0 0 3	Class Work Marks:	50
	Exam Marks:	50
	Total Marks:	100
	Duration of exam:	3 hrs

I. Create a database and write the programs to carry out the following operation:

Add a record in the database
Delete a record in the database
Modify the record in the database
Generate queries
Generate the report
List all the records of database in ascending order.

II Develop two menu driven projects for management of database system:

1. Library information system
a. Engineering
b. MCA
2. Inventory control system
a. Computer Lab
b. College Store
3. Student information system
c. Academic
d. Finance
4. Time table development system
e. CSE, IT & MCA Departments
f. Electrical & Mechanical Departments

Usage of S/w:

1. VB, ORACLE and/or DB2
2. VB, MSACCESS
3. ORACLE, D2K
4. VB, MS SQL SERVER 2000

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

CSE-214-F **INTERNET LAB.**

L T P
0 0 2

Class Work Marks: 25
Exam Marks: 25
Total Marks: 50
Duration of exam: 3 hrs

Exercises involving:

Sending and receiving mails.

Chatting on the net.

Using FTP and Tel net server.

Using HTML Tags (table, form, image, anchor etc.).

Making a Web page of your college using HTML tags.

Note: At least 10 exercise to be given by the teacher concerned.

GP-202-F GENERAL FITNESS FOR THE PROFESSION

L T P
0 0 2

Class Work: 50 Marks

- Quiz & Aptitude
- Comprehension,
- Communication for specifics.
- Lets Speek
- Composition skills- Formal letter writing based on the trends in practice in corporate culture.
- Training on etiquettes & manners should be carried further and be observed during the general classes, if required even the faculty should imparted some training on the same.

EC-511-F ANTENNA AND WAVE PROPOGATION

L T P	Class work Marks: 50
3 1 -	Theory Marks : 100
	Total Marks : 150
	Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

RADIATION OF ELECTROMAGNETIC WAVES: Retarded potential, field of short dipole, Antenna pattern & antenna parameters.

ANTENNA PARAMETERS: Antenna pattern, Gain, Directivity, Radiation resistance, Aperture, Beam-width etc, Reciprocity theorem of antenna.

Section-B

ELEMENTAL ANTENNA: Wave equation for radiated fields from current and voltage sources in terms of electric scalar potential and magnetic vector potential .Fields and pattern of an infinitesimal dipole. Definition of various potentials use in antenna theory.

Section-C

PRACTICAL LINEAR ANTENNAS: Relation between current distribution and field pattern of an antenna, linear antenna, half wave dipole, Antenna impedance, Directivity, Radiation resistance, Directional properties, Effect of ground on antenna pattern, Input impedance Broad band matching. Mutual impedance.

ANTENNA ARRAYS: Two element array, broad side, End fired pattern, Beam width pattern multiplication, multi element array and their properties, Synthesis of an array.

Section-D

VARIOUS TYPES OF ANTENNA: parabolic feeds, conical, helix, log periodic, horn, Microwave antenna.

PROPAGATION: Ground waves, Space waves, Effect of Earth, Duct formation, Ionosphere, and sky waves.

TEXT BOOKS

1. Antennas by J.D.Kraus, TMH.
2. Antenna & Wave Propagation by K.D Prasad.

REFRENCE BOOKS:

1. Antenna & Radio wave Propagation by Collin, TMH
2. Electromagnetic Waves & Radiating Systems by Jordan & Balman, PHI.

EC-512-F MICROPROCESSORS AND INTERFACING

L	T	P	
3	1	-	

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

THE 8085 PROCESSOR: Introduction to microprocessor, 8085 microprocessor : Architecture, instruction set, interrupt structure, and assembly language programming.

THE 8086 MICROPROCESSOR ARCHITECTURE : Architecture, block diagram of 8086, details of sub-blocks such as EU, BIU; memory segmentation and physical address computations, program relocation, addressing modes, instruction formats, pin diagram and description of various signals.

Section-|B

INSTRUCTION SET OF 8086: Instruction execution timing, assembler instruction format, data transfer instructions, arithmetic Instructions, branch instructions, looping instructions, NOP and HLT instructions, flag manipulation instructions, logical instructions shift and rotate instructions, directives and operators, programming examples.

Section-C

INTERFACING DEVICE: The 8255 PPI chip: Architecture, control words, modes and examples.

Section-D

DMA: Introduction to DMA process, 8237 DMA controller,

INTERRUPT AND TIMER: 8259 Programmable interrupt controller, Programmable interval timer chips.

TEXT BOOKS:

1. Microprocessor Architecture, Programming & Applications with 8085 : Ramesh S Gaonkar; Wiley Eastern Ltd.
2. The Intel Microprocessors 8086- Pentium processor : Brey; PHI

REFERENCE BOOKS:

1. Microprocessors and interfacing : Hall; TMH
2. The 8088 & 8086 Microprocessors-Programming, interfacing, Hardware & Applications: Triebel & Singh; PHI
3. Microcomputer systems: the 8086/8088 Family: architecture, Programming & Design: Yu-Chang Liu & Glenn A Gibson; PHI. Advanced Microprocessors and Interfacing: Badri Ram; TMH

CSE-301-F PRINCIPLES OF OPERATING SYSTEMS

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

.
Introduction to Operating System Concepts (including Multitasking, multiprogramming, multi user, Multithreading etc)., Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.

Process Management: Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms -First Come First Serve (FCFS), Shortest-Job- First (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling.

Section-B

Memory Management: Logical & Physical Address Space, swapping, contiguous memory allocation, non-contiguous memory allocation paging and segmentation techniques, segmentation with paging; virtual memory management - Demand Paging & Page-Replacement Algorithms; Demand Segmentation.

Section-C

File System: Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms, Introduction to distributed file system.

Process-Synchronization & Deadlocks: Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, avoidance & detection; deadlock recovery.

Section-D

I/O Systems: I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Performance Issues.

Unix System and Windows NT Overview Unix system call for processes and file system management, Shell interpreter, Windows NT architecture overview, Windows NT file system.

TEXT BOOKS:

1. Operating System Concepts by Silberchatz et al, 5th edition, 1998, Addison-Wesley.
2. Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
3. Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall

REFERENCE BOOKS:

1. Operating System By Peterson , 1985, AW.
2. Operating System By Milankovic, 1990, TMH.
3. Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH.
4. Operating Systems by Mandrik & Donovan, TMH
5. Operating Systems By Deitel, 1990, AWL.
6. Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003.

IC-403-F EMBEDDED SYSTEMS DESIGN

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

Introduction: Embedded microcontrollers, External memory microcontrollers; processor Architectures: Harvard V/S Pronceton, CISE V/S RISC; Microcontroller's memory types, Microcontroller's features: clocking, I/O pins, interrupts, timers, peripherals.

Section B

Microcontroller Architecture Introduction to PIC microcontrollers, Architecture and pipelining, program memory considerations, Addressing modes, CPU registers, Instruction set, simple operations.

Section C

Interrupts and I/O Ports Interrupt logic, Timer 2 scalar initialization, Int Service Interrupt service routine, loop time subroutine, External interrupts and timers, Synchronous serial port module, Serial peripheral device, O/p port Expansion, I/p port expansion, UART.
Software Development tools/environments, Assembly language programming style, Interpreters, High level languages, Intel hex format object files, Debugging.

Section D

Programming with Microcontrollers Arithmetic operations, Bit addressing, Loop control, Stack operation. Subroutines, RAM direct addressing, state machines, Oscillators, Timer Interrupts, Memory mapped I/O.
Designing using microcontrollers: Music box, Mouse wheel turning, PWN motor control, Aircraft Demonstration, ultra sonic distance measuring, Temperature Sensor, Pressure Sensor, and Magnetic Field Sensor.

TEXT BOOK:

1. Design with PIC Microcontrollers by John B. Peatman, Pearson.

REFERENCE BOOKS:

1. Programming and Customizing the 8051 Microcontroller: Predko : TMH.
2. Designing Embedded Hardware: John Catsoulis; Shroff Pub. & Distr. ND
3. Programming Embedded Systems in C & C++: Michael Barr; Shroff Pub & Distr ND.

CSE-404-F ADVANCED JAVA

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction to Java, Data types, variables, operators, Arrays, Control Statements, Classes & Methods, Inheritance, Exception Handling, Multithreading, Collections, I/O streams, AWT & Applet Programming.

Connecting to a Server, Implementing Servers, Sending E-Mail, Making URL Connections, Advanced Socket Programming

Section-B

The Design of JDBC. The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Matadata, Row Sets, Transactions, Advanced Connection Management, Introduction of LDAP

The Roles of Client and Server, Remote Method Invocations, Setup for Remote Method Invocation, Parameter Passing in Remote Methods Server Object Activation, Java IDL and CCRA, Remote Method Calls with SOAP

Section-C

SWING: Lists, Trees, Tables, Styled Text Components, Progress Indicators, Component Organizers

AWT :The Rendering Pipeline, Shapes, Areas, Strokes, Paint, Coordinate Transformations, Clipping, Transparency and Composition, Rendering Hints, Readers and Writers for Images, Image Manipulation, Printing. The Clipboard, Drag and Drop

Section-D

JAVABEANS COMPONENTS: Beans, the Bean-Writing Process, Using Beans to Build an Application, Naming Patterns for Bean Components and Events Bean Property Tubes Bean info Classes Property Editors Cuatomizes.

SECURITY: Class Loaders, Bytecode Verification, Security Managers and Permissions, Digital Signatures, Code Signing, Encryption

TEXT BOOK:

1. Core Java TM 2, Volume II-Advanced Features, 7th Edition by Cay Horetmann, Gary Cornelll Pearson Publisher, 2004

REFERENCE BOOKS:

1. Professional Java Programming by Brett Spell, WROX Publication
2. Advanced Java 2 Platform, How to Program, 2nd Edition, Harvey. M. Dietal, Prentice Hall

HUM-453-F HUMAN RESOURCE MANAGEMENT

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

Understanding Organizational Behavior: Definition, Goals of Organizational behavior. Key forces affecting Organizational Behavior. Fundamental Concepts of Organizational Behavior.
Motivation : Meaning, Objectives and importance of motivation. Theories of Motivation, Maslow's theory, Mc Greger's Theory Herzberg's theory.
Morale : Meaning; Factors affecting morale, types of morale and productivity, Evaluation of morale, improving morale.

Section B

Communication: Definition & importance, Nature of leadership various approaches to leadership styles.
Leadership: Definition & importance, Nature of leadership various approaches to leadership styles.

Section C

Importance of human resources in industry, Definition of human resource management, mechanical approach towards personnel, Paternalism, Social system approach.
Need for human resource planning, process of human resource planning, Methods of recruitment, Psychological tests and interviewing meaning and importance of placement Meaning and techniques of induction. Training and development : Concepts of training and development, importance of training and development, Management development its nature, purpose and method.

Section D

Significant factors affecting compensation, Methods of wage payment, Wage differentials, Causes of difference in Wages, Types of wage differentials, Wage incentives, Meaning, Objectives, types of incentive plans.

Text Books:

1. Human Resource and Personnel Management-K. Aswathappa-Tata McGraw Hill Publishing Company Ltd.
2. Personnel Management : C.B. Mamoria, Himalaya Publishing House.
3. Organisational Behavior-Dr. L.M. Prasad (Sultan Chand & Sons).

Reference Books:

1. Personnel Management & Industrial Relations : Dr. T.N.Bhagoliwal Sahitya Bhawan Agra.
2. Personnel Management : V.G. Karnik, Jaico Publishing House.
3. Personnel management & Industrial Relation : Tripathi : Sultan Chand & Sons.
4. Personnel Management-Arun Monappa & Mirza Saiyadain- Tata McGraw Hill Publishing Co. Ltd.
5. Personnel Management and Industrial Relations-D.C. Sharma & R.C. Sharma S.J. Publications.
6. Principles of Personnel Management-Edwin B. Flippo (McGraw Hill).
7. Organizational Behavior-K. Adwathappa.
8. Organizational Behavior-John W. Newsstorn & Keith Davis, Tata McGraw Hill Publishing Company Limited, New Delhi.

EC-515-F MICROPROCESSORS AND INTERFACING LAB

L T P	Practical : 50 Marks
0 0 2	Class work : 50 Marks
	Total : 100 Marks

LIST OF EXPERIMENTS:

1. Study of 8085 Microprocessor kit.
2. Write a program using 8085 and verify for :
   a. Addition of two 8-bit numbers.
   b. Addition of two 8-bit numbers (with carry).
3. Write a program using 8085 and verify for :
   a. 8-bit subtraction (display borrow)
   b. 16-bit subtraction (display borrow)
4. Write a program using 8085 for multiplication of two 8- bit numbers by repeated addition method. Check for minimum number of additions and test for typical data.
5. Write a program using 8085 for multiplication of two 8- bit numbers by bit rotation method and verify.
6. Write a program using 8085 for division of two 8- bit numbers by repeated subtraction method and test for typical data.
7. Write a program using 8085 for dividing two 8- bit numbers by bit rotation method and test for typical data.
8. Study of 8086 microprocessor kit
9. Write a program using 8086 for division of a defined double word (stored in a data segment) by another double Word division and verify.
10. Write a program using 8086 for finding the square root of a given number and verify.
11. Write a program using 8086 for copying 12 bytes of data from source to destination and verify.
12. Write a program using 8086 and verify for:
    a. Finding the largest number from an array.
    b. Finding the smallest number from an array.
13. Write a program using 8086 for arranging an array of numbers in descending order and verify.
14. Write a program using 8086 for arranging an array of numbers in ascending order and verify.
15. Write a program for finding square of a number using look-up table and verify.
16. Write a program to interface a two digit number using seven-segment LEDs. Use 8085/8086 Microprocessor.

NOTE: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

EC-516-F ELECTRONICS CIRCUIT SIMULATION LAB

L T P	Theory : 50 Marks
0 0 2	Class work : 50 Marks
	Total : 100 Marks

LIST OF EXPERIMENTS:

1. Simulate and study half-wave, full-wave, and bridge-rectifier using PSPICE windows
2. Simulate and study diode clipper and clamper circuits using PSPICE windows
3. Simulate and study emitter bias and fixed bias BJT and JFET circuits using PSPICE windows, and determine quiescent conditions.
4. Simulate a common emitter amplifier using self biasing and study the effect of variation in emitter resistor on voltage gain, input and output impedance using PSPICE windows .
5. Determine the frequency response of Vo/Vs for CE BJT amplifier using PSPICE windows. Study the effect of cascading of two stages on band width.
6. Simulate and study Darlington pair amplifier circuit using PSPICE windows and determine dc bias and output ac voltage .
7. Study an operational amplifier using PSPICE windows and find out: CMMR, gain band width product, slew rate, 3-db frequency, and input offset voltage.
8. Simulate and study active low pass, high pass, and band pass filters using PSPICE windows.
9. Simulate and study class A, B, C, and AB amplifier using PSPICE windows.
10. Study the operation of 555 timer oscillator using PSPICE.
11. Simulate logic expression ..and determine its truth table.
12. Simulate logic expression of full adder circuit and determine its truth table.
13. Simulate a synchronous 4-bit counter and determine its count sequence.
14. Simulate a master-slave flip-flop using NAND gates and study its operation. Study the operation of asynchronous preset and clear.

NOTE: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

CSE-406-F **ADVANCED JAVA LAB.**

L T P	Class Work Marks:	50
0 0 2	Exam Marks:	50
	Total Marks:	100
	Duration of exam:	3 hrs

Development of programs relating to:

1. JDBC
2. Servlets
3. Beans
4. RMI
5. JSP

Note : At least 10 programs are required to be developed in the semester.

EC-611-F CONTROL SYSTEM ENGINEERING

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

INTRODUCTORY CONCEPTS: System/Plant model, types of models, illustrative examples of plants and their inputs and outputs, controller, servomechanism, regulating system, linear time-invariant (LTI) system, time-varying system, causal system, open loop control system, closed loop control system, illustrative examples of open-loop and feedback control systems, continuous time and sampled data control systems. Effects of feedback on sensitivity (to parameter variations), stability, external disturbance (noise), overall gain etc. Introductory remarks about non-linear control systems.

Section-B

MATHEMATICAL MODELLING: Concept of transfer function, relationship between transfer function and impulse response, order of a system, block diagram algebra, signal flow graphs : Mason s gain formula & its application, characteristic equation, derivation of transfer functions of electrical and electromechanical systems. Transfer functions of cascaded and non-loading cascaded elements. Introduction to state variable analysis and design.

TIME DOMAIN ANALYSIS : Typical test signals, time response of first order systems to various standard inputs, time response of 2nd order system to step input, relationship between location of roots of characteristics equation, w and wn, ime domain specifications of a general and an under-damped 2nd order system, steady state error and error constants, dominant closed loop poles, concept of stability, pole zero configuration and stability, necessary and sufficient conditions for stability, Hurwitz stability criterion, Routh stability criterion and relative stability.

Section-C

ROOT LOCUS TECHNIQUE: Root locus concept, development of root loci for various systems, stability considerations.

FREQUENCY DOMAIN ANALYSIS : Relationship between frequency response and time-response for 2nd order system, polar, Nyquist, Bode plots, stability, Gain-margin and Phase Margin, relative stability, frequency response specifications.

Section-D

COMPENSATION: Necessity of compensation, compensation networks, application of lag and lead compensation, basic modes of feedback control, proportional, integral and derivative controllers, illustrative examples.

CONTROL COMPONENTS: Synchros, AC and DC techo-generators, servomotors, stepper motors, & their applications, magnetic amplifier.

TEXT BOOK :

1. Control System Engineering : I.J.Nagrath & M.Gopal; New Age

REFERENCE BOOKS :

1. Automatic Control Systems : B.C.Kuo, PHI.
2. Modern Control Engg : K.Ogata; PHI.
3. Control Systems - Principles & Design : Madan Gopal; Tata Mc Graw Hill.
4. Modern Control Engineering.R.C.Dorl & Bishop; Addison-Wesley

CSE-302-F PRINCIPLES OF SOFTWARE ENGINEERING

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction: The process, software products, emergence of software engineering, evolving role of software, software life cycle models, Software Characteristics, Applications, Software crisis.

Software project management: Project management concepts, software process and project metrics Project planning, project size estimation metrics, project estimation Techniques, empirical estimation techniques, COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking.

Requirements Analysis and specification requirements engineering, system modeling and simulation Analysis principles modeling, partitioning Software, prototyping: , Prototyping methods and tools; Specification principles, Representation, the software requirements specification and reviews Analysis Modeling: Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling; The mechanics of structured analysis: Creating entity/ relationship diagram, data flow model, control flow model, the control and process specification; The data dictionary; Other classical analysis methods.

Section-B

System Design: Design concepts and principles: the design process: Design and software quality, design principles; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity; the design model; Design documentation. Architectural Design: Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs, architectural complexity; Mapping requirements Into software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design.

Section-C

Testing and maintenance: Software Testing Techniques, software testing fundamentals: objectives, principles, testability; Test case design, white box testing, basis path testing: Control structure testing: Black box testing, testing for specialized environments, architectures and applications. Software Testing Strategies: Verification and validation, Unit testing, Integration testing,; Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, the debugging process debugging approaches. Software re-engineering, reverse engineering, restructuring, forward engineering

Section-D

Software Reliability and Quality Assurance :Quality concepts, Software quality assurance , SQA activities; Software reviews: cost impact of software defects, defect amplification and removal; formal technical reviews: The review meeting, review reporting and record keeping, review guidelines; Formal approaches to SQA; Statistical software quality assurance; software reliability: Measures of reliability and availability ,The ISO 9000 Quality standards: The ISO approach to quality assurance systems, The ISO 9001 standard, Software Configuration Management.

Computer aided software Engineering: CASE, building blocks, integrated case environments and architecture, repository.

TEXT BOOK:

1. Software Engineering – A Practitioner's Approach, Roger S. Pressman, 1996, MGH.

REFERENCE BOOKS:

1. Fundamentals of software Engineering, Rajib Mall, PHI
2. Software Engineering by Ian Summerville, Pearson Edu, 5th edition, 1999, AW,
3. Software Engineering – David Gustafson, 2002, T.M.H
4. Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995 JW&S,
5. An Integrated Approach to software engineering by Pankaj jalote , 1991 Narosa,

CSE-206-F THEORY OF AUTOMATA COMPUTATION

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Finite Automata and Regular Expressions: Finite State Systems, Basic Definitions Non-Deterministic finite automata (NDFA), Deterministic finite automata (DFA), Equivalence of DFA and NDFA Finite automata with E-moves, Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa.

Introduction to Machines: Concept of basic Machine, Properties and limitations of FSM. Moore and mealy Machines, Equivalence of Moore and Mealy machines, Conversion of NFA to DFA by Arden's Method.

Section-B

Properties of Regular Sets: The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.

Grammars: Definition, Context free and Context sensitive grammar, Ambiguity regular grammar, Reduced forms, Removal of useless Symbols and unit production, Chomsky Normal Form (CNF), Griebach Normal Form (GNF).

Section-C

Pushdown Automata: Introduction to Pushdown Machines, Application of Pushdown Machines

Turing Machines: Deterministic and Non-Deterministic Turing Machines, Design of T.M, Halting problem of T.M., PCP Problem.

Section-D

Chomsky Hierarchies: Chomsky hierarchies of grammars, Unrestricted grammars, Context sensitive languages, Relation between languages of classes.
Computability: Basic concepts, Primitive Recursive Functions.

TEXT BOOK:

1. Introduction to automata theory, language & computations- Hopcroaft & O.D.Ullman, R. Mothwani, 2001, AW

REFERENCE BOOKS:

1. Theory of Computer Sc. (Automata, Languages and computation):K.L.P.Mishra & N.Chandrasekaran, 2000, PHI.
2. Introduction to formal Languages & Automata-Peter Linz, 2001, Narosa Publ..
3. Fundamentals of the Theory of Computation- Principles and Practice by RamondGreenlaw and H. James Hoover, 1998, Harcourt India Pvt. Ltd..
4. Elements of theory of Computation by H.R. Lewis & C.H. Papaditriou, 1998, PHI.
5. Introduction to languages and the Theory of Computation by John C. Martin 2003, T.M.H.

EC-614-F DIGITAL SIGNAL PROCESSING

L	T	P	
3	1	-	

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

DISCRETE-TIME SIGNALS: Signal classifications, frequency domain representation, time domain representation, representation of sequences by Fourier transform, properties of Fourier transform, discrete time random signals, and energy and power theorems.

Section-B

DISCRETE-TIME SYSTEMS: Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite impulse response (IIR) system.

SAMPLING OF TIME SIGNALS: Sampling theorem, application, frequency domain representation of sampling, reconstruction of band limited signal from its samples. discrete time processing of continuous time signals, changing the sampling rate using discrete time processing.

Section-C

Z-TRANSFORM: Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Z-transform, applications of Z-transform.

BASICS OF DIGITAL FILTERS: Fundamentals of digital filtering, various types of digital filters, design techniques of digital filters window technique for FIR, bi-linear transformation and backward difference methods for IIR filter design, analysis of finite word length effects in DSP, DSP algorithm implementation consideration. Applications of DSP.

Section-D

MULTIRATE DIGITAL SIGNAL PROCESSING: Introduction to multirate digital signal processing, sampling rate conversion, filter structures, multistage decimator and interpolators, digital filter banks.

TEXT BOOKS:

1. Digital Signal Processing: Proakis and Manolakis; PHI
2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH

REFERENCE BOOKS:

1. Digital Signal Processing: Alon V. Oppenhelm;PHI
2. Digital Signal processing (II-Edition): Mitra, TMH

EC-615-F INFORMATION SECURITY SYSTEMS

L	T	P		
3	1	-	Theory	: 100 Marks
			Class work:	50 Marks
			Total	: 150 Marks

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Overview: Services, Mechanisms, and Attacks, the OSI Security Architecture, A Model for Network, Security. Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, Stegnography.
Block Ciphers And The Data Encryption Standard Simplified DES, Block Cipher Principles, The Data Encryption Standard, The Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles, Block Cipher Modes of Operation.

Section-B

Introduction To Finite Fields: Groups, Rings, and Fields, Modular Arithmetic, Euclid's Algorithm, Finite Fields of the Form GF(p), Polynomial Arithmetic, Finite Fields of the Form GF(2n). Advanced Encryption Standard Evaluation Criteria for AES, The AES Cipher. Contemporary Symmetric Ciphers Triple DES, Blowfish, RC5, Characteristics of Advanced Symmetric Block Ciphers, RC4 Stream Cipher.Confidentiality Using Symmetric Encryption Placement of Encryption Function, Traffic Confidentiality, Key Distribution, Random Number Generation. Public-Key Encryption and Hash Functions: Introduction to Number Theory: Prime Numbers, Format's and Euler's Theorems, Testing for Primality.

Section-C

The Chinese Remainder Theorem, Discrete Logarithms. Public-Key Cryptography and RSA: Principles of Public-Key Cryptosystems, the RSA Algorithm, Recommended Reading and Web Site, Key Terms, Review Questions, and Problems. Key Management and Other Public-Key Cryptosystems Key Management, Diffie-Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography. Message Authentication and Hash Functions Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Security of Hash Functions and MACs. Hash Algorithms: MD5 Message Digest Algorithm, Secure Hash Algorithm, RIPEMD-160, and HMAC.

Section-D

Digital Signatures and Authentication Protocols Digital Signatures, Authentication Protocols, Digital Signature Standard. Network Security Practice Authentication Applications: Kerberos, X.509 Authentication Service, Electronic Mail Security: Pretty Good Privacy, S/MIME. IP Security IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations, Key Management, Web Security Web Security Considerations, Secure

Sockets Layer and Transport Layer Security, Secure Electronic Transaction. System Security Intruders Intruders, Intrusion Detection, Password Management, Malicious Software Viruses and Related Threats, Virus Countermeasures, Firewalls Firewall Design Principles, Trusted Systems.

REFRENCE BOOKS:

1. William Stallings, “Cryptography and network Security”, Pearson Education 2003.
2. Trappe & Washington, “Introduction to Cryptography with Coding Theory”, Prentice-Hall 2001
3. D Stinson, “Cryptography: Theory and Practice”, Second Edition Chapman & Hall 2002.
4. Kaufman, Perlman, and Speciner, “Network Security”, Prentice-Hall Second Edition 2001.
5. Michael E. Whitman, “Principles of information Security” , Cengage Learning, New Delhi

IT-305-F **COMPUTER NETWORKS**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

OSI Reference Model and Network Architecture: Introduction to Computer Networks, Example networks ARPANET, Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular –Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer

Section-B

TCP/IP: Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol , User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6.

Section-C

Local Area Networks: Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.

Wide Area Networks: Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB), Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay.,Wireless Links.

Section-D

Introduction to Network Management: Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000.

TEXT BOOKS:

1. Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

REFERENCE BOOKS:

1. Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000, Addison Wesley, Low Price Edition.
2. Business Data Communications, Fitzgerald Jerry.
3. Computer Networks – A System Approach, Larry L. Peterson & Bruce S. Davie, 2nd Edition
4. Computer Networking – ED Tittel , 2002, T.M.H.

EC-616-F **CONTROL SYSTEM LAB**

L T P	Theory : 25 Marks
0 0 2	Class work : 25 Marks
	Total : 50 Marks

LIST OF EXPERIMENTS:

1. To study A.C. servo motor and to plot its torque speed characteristics.
2. To study D.C. servo motor and to plot its torque speed characteristics.
3. To study the magnetic amplifier and to plot its load current v/s control current characteristics for:
   (a) Series connected mode
   (b) Parallel connected mode.
4. To plot the load current v/s control current characteristics for self exited mode of the magnetic Amplifier.
5. To study the synchro & to:
   (a) Use the synchro pair (synchro transmitter & control transformer) as an error detector.
   (b) Plot stator voltage v/s rotor angle for synchro transmitter i.e. to use the synchro transmitter as Position transducer.
6. To use the synchro pair (synchro transmitter & synchro motor) as a torque trans mitter.
7. (a) To demonstrate simple motor driven closed loop position control system.
   (b) To study and demonstrate simple closed loop speed control system.
8. To study the lead, lag, lead-lag compensators and to draw their magnitude and phase plots .
9. To study a stepper motor & to execute microprocessor or computer-based control of the same by changing number of steps, direction of rotation & speed.
10. To implement a PID controller for level control of a pilot plant.
11. To implement a PID controller for temperature control of a pilot plant.
12. To study the MATLAB package for simulation of control system design.

NOTE: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

EC-618-F DIGITAL SIGNAL PROCESSING LAB

L T P	Theory : 25 Marks
0 0 2	Class work : 25 Marks
	Total : 50 Marks

LIST OF EXPERIMENTS:

Perform the experiments using MATLAB:

1. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine).
2. To develop program for discrete convolution.
3. To develop program for discrete correlation.
4. To understand stability test.
5. To understand sampling theorem.
6. To design analog filter(low-pass, high pass, band-pass, band-stop).
7. To design digital IIR filters(low-pass, high pass, band-pass, band-stop).
8. To design FIR filters using windows technique.
9. To design a program to compare direct realization values of IIR digital filter
10. To develop a program for computing parallel realization values of IIR digital filter.
11. To develop a program for computing cascade realization values of IIR digital filter
12. To develop a program for computing inverse Z-transform of a rational transfer function.

NOTE: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

EC-711-F SYSTEM SIMULATION AND MODELING

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction to Simulation: System & System Environment, Components of a System, Discrete and Continuous Systems, Model of a System and Types of Models,. Discrete Event System Simulation, Advantages and Disadvantages of Simulation, Areas of Application.

Section-B

Techniques of Simulation: Monte Carlo Method, Types of System Simulations, Real Time Simulation, Stochastic Variables, Discrete Probability Functions General Principles: Concepts in Discrete Event Simulation, Event Scheduling /Time Advance Algorithm, List Processing, Using Dynamic Allocation & Linked List Simulation Software: History of Simulation Software, Selection of Simulation Software, Simulation in C++, GPSS, Simulations Packages, Trends in simulation Software

. **Section-C**

Statistical Models in Simulation: Useful Statistical Models, Discrete Distribution s, Continuous Distributions, Poisson Process, Empirical Distributions Queuing Models: Characteristics of Queuing systems, Queuing Notation, Long Run Measures of performance of Queuing Systems, Steady State Behavior of infinite Population Markovian Models, Steady State Behavior of finite Population Models.

Section-D

Networks of Queues Random Number Generation: Properties of Random Numbers, Generation of Pseudo-Random Numbers, Techniques for Generating Random Numbers, Tests for Random Numbers, Inverse transform Techniques, Convolution Methods, and Acceptance –Rejection Techniques Input Modeling: Data Collection, Identifying the Distribution with Data, Parameter Estimation, Chi – Square Test, Selecting Input Models with Data Verification & Validation of simulation Modeling: Model Building, Verification & Validation, Verification of simulation Models, Calibration & Validation of Models.

REFRENCE BOOKS:

1. Gordon G, “System Simulation”, PHI 2nd Edition 1998.
2. Deo Narsingh, “System Simulation with Digital Computers”, PHI, New Delhi 1993.
3. K S Trivedi, “Probability and Statistics with Reliability, Queuing and Computer Science Application”, PHI
4. Subranranian, K R V and Sudaresan R Kadayam, “System simulation: Introduction to GPSS”, CBS, New Delhi 1993.
5. W Feller, ”An introduction to Probability Theory and its Applications,” Val 182, Wiley Eastern Ltd. ND.

EC-712-F **COMPILER DESIGN**

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Compiler structure: analysis-synthesis model of compilation, various phases of a compiler, tool based approach to compiler construction. Lexical analysis interface with input, parser and symbol table, token, lexeme and patterns.

Section-B

Difficulties in lexical analysis. Error reporting. Implementation. Regular definition, Transition diagrams, LEX. Syntax analysis: CFGs, ambiguity, associativity, precedence, top down parsing, recursive descent parsing, transformation on the grammars, predictive parsing, bottom up parsing, operator precedence grammars, LR parsers (SLR, LALR, LR), YACC.

Section-C

Syntax directed definitions: inherited and synthesized attributes, dependency graph, evaluation order, bottom up and top down evaluation of attributes, L- and S-attributed definitions. Type checking: type system, type expressions, structural and name equivalence of types, type conversion, overloaded functions and operators, polymorphic functions. Run time system: storage organization, activation tree, activation record, parameter passing, symbol table, dynamic storage allocation.

Section-D

Intermediate code generation: intermediate representations, translation of declarations, assignments, control flow, Boolean expressions and procedure calls. Implementation issues. Code generation and instruction selection: issues, basic blocks and flow graphs, register allocation, code generation, dag representation of programs, code generation from dags, peep hole optimization, code generator generators, specifications of machine.

REFRENCE BOOKS:

1. V. Aho, R. Sethi, and J. D. Ullman. Compilers: Principles, Techniques and Tools , Addison-Wesley, 1988.
2. Fischer and R. LeBlanc. Crafting a Compiler, Benjamin Cummings, 1991..
3. C. Holub. Compiler Design in C, Prentice-Hall Inc., 1993.
4. Appel. Modern Compiler Implementation in C: Basic Design, Cambridge Press.
5. Fraser and Hanson. A Retargetable C Compiler: Design and Implementation, Addison-Wesley.

IT-401-F DATA WAREHOUSING AND DATA MINING

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

Data warehousing Definition, usage and trends. DBMS vs data warehouse, Data marts, Metadata, Multidimensional data mode, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations.
Data warehouse process & architecture, OLTP vs OLAP, ROLAP vs MOLAP, types of OLAP, servers, 3-Tier data warehouse architecture, distributed and virtual data warehouses, data warehouse manager.

Section B

Data warehouse implementation, computation of data cubes, modelling OLAP data, OLAP queries manager, data warehouse back end tools, complex aggregation at multiple granularities, tuning and testing of data warehouse.

Section C

Data mining definition & task, KDD versus data mining, data mining techniques, tools and applications.
Data mining query languages, data specification, specifying knowledge, hierarchy specification, pattern presentation & visualisation specification, data mining languages and standardisation of data mining.

Section D

Data mining techniques: Association rules, Clustering techniques, Decision tree knowledge discovery through Neural Networks & Genetic Algorithm, Rough Sets, Support Victor Machines and Fuzzy techniques.
Mining complex data objects, Spatial databases, Multimedia databases, Time series and Sequence data; mining Text Databases and mining Word Wide Web.

Text Books:

- Data Warehousing In the Real World; Sam Anahory & Dennis Murray; 1997, Pearson
- Data Mining- Concepts & Techniques; Jiawei Han & Micheline Kamber- 2001, Morgan Kaufmann.
- Data Mining Techniques; Arun Pujar; 2001, University Press; Hyderbad.

Reference Books:

- Data Mining; Pieter Adriaans & Dolf Zantinge; 1997, Pearson,
- Data Warehousing, Data Miniing and OLTP; Alex Berson, 1997, Mc Graw Hill.
- Data warehousing System; Mallach; 2000, Mc Graw Hill.
- Building the Data Warehouse; W.H. Inman, 1996, John Wiley & Sons.
- Developing the Data Warehouses; W.H Ionhman,C.Klelly, John Wiley & Sons.
- Managing the Data Warehouses; W.H.Inman, C.L.Gassey, John Wiley & Sons. .

EE-402-F **WIRELESS COMMUNICATION**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS: Evolution of mobile radio communications, examples of wireless comm. systems, paging systems, Cordless telephone systems, comparison of various wireless systems.

MODERN WIRELESS COMMUNICATION SYSTEMS: Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, Blue tooth and Personal Area networks.

Section-B

INTRODUCTION TO CELLULAR MOBILE SYSTEMS: Spectrum Allocation, basic Cellular Systems, performance Criteria, Operation of cellular systems, analog cellular systems, digital Cellular Systems.

CELLULAR SYSTEM DESIGN FUNDAMENTALS: Frequency Reuse, channel assignment strategies, handoff Strategies, Interference and system capacity, tracking and grade off service, improving coverage and capacity.

Section-C

MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION: Introduction to Multiple Access, FDMA, TDMA, Spread Spectrum multiple Access, space division multiple access, packet ratio, capacity of a cellular systems.

WIRELESS NETWORKING: Difference between wireless and fixed telephone networks, development of wireless networks, fixed network transmission hierarchy, traffic routing in wireless networks, wireless data services, common channel signaling, ISDN (Integrated Services digital Networks), advanced intelligent networks.

Section-D

INTELLIGENT CELL CONCEPT AND APPLICATION: Intelligent cell concept, applications of intelligent micro-cell Systems, in-Building Communication, CDMA cellular Radio Networks.

TEXT BOOKS:

1. Wireless Communications: Theodore S. Rappaport; Pearsons.
2. Mobile Cellular Telecommunication: W.C.Y.Lee; McGraw Hill

REFERENCE BOOK:

1. Mobile Communications: Jochen Schiller; Pearson

EC-715-F SYSTEM SIMULATION AND MODELING LAB

L T P	
0 0 2	Theory : 50 Marks Class work : 50 Marks Total : 100 Marks

LIST OF EXPERIMENTS:

Implementation of the followings Simulation problems in GPSS or any High Level Programming Language

1. Computer Generation of Random Numbers.
2. Testing Random Number Generators.
3. Monte-Carlo Simulation.
4. Simulation of Single Server Queuing System.
5. Simulation of Two-Server Queuing System.
6. Simulation of Inventory System.
7. Simulation of Telephone System.

NOTE: Ten experiments are to be performed. Remaining experiments may either be designed & set by the concerned institution as per the scope of the syllabus.

CSE-411-F **COMPILER DESIGN LAB**

L T P	Class Work Marks:	50
0 0 3	Exam Marks:	50
	Total Marks:	100
	Duration of exam:	3 hrs.

1. Practice of LEX/YACC of compiler writing.
2. Write a program to check whether a string belong to the grammar or not.
3. Write a program to generate a parse tree.
4. Write a program to find leading terminals.
5. Write a program to find trailing terminals.
6. Write a program to compute FIRST of non-terminal.
7. Write a program to compute FOLLOW of non-terminal.
8. Write a program to check whether a grammar is left Recursion and remove left Recursion.
9. Write a program to remove left factoring.
10. Write a program to check whether a grammar is operator precedent.
11. To show all the operations of a stack.
12. To show various operations i.e. red, write and modify in a text file.

Note : At least 10 programs are required to be developed in the semester.

CSE-413-F **PROJECT**

L T P
0 0 8

Class Work Marks: 100
Exam Marks: 100
Total Marks: 200
Duration of Exam: 3 Hrs.

PHY-451-F NANO TECHNOLOGY

L T P	Class Work Marks: 50
3 1 0	Exam Marks: 100
	Total Marks: 150
	Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

Introduction to Nanotech: Crystalline-Non crystalline materials, Fundamental of Nanotechnology and Nanomaterials in Metals, other Materials, & Biosystem, Molecular Recognition, Quantum Mechanics and Quantum Ideas in Nanotechnology. Semiconductor Nanoparticles.

Section B

Preparation and Characterization of Nanoparticles: Nanoscale Lithography, Dip Pen Lithography, E-Beam Lithography, Nanosphere Life off, Lithography; Molecular Synthesis, Nanoscale Crystal Growth, Polymerization Nanobricks and Building blocks: Tools for Measuring Nanostructures-Scanning Prob Instrument, Spectroscopy, Electrochemistry, Election Microscope Tools to Make Nanostructure.

Section C

Properties & Application of Nano Crystalline Materials: Application in Sensors, Nanoscale Biostructure Electronics, Magnets, optics, Fabrication Biomedical Applications, Smart Materials-Self Healing Structures, Heterogenous Nanostructure and composites En capsulation, Carbon Nanotubes.

Section D

Synthesis of semiconductor Nanoclusters, Processing of Nanomaterials Nanobusiness-Boom, Bust and Nano Tech. NanoEthics

Text Books:

1. Camarata, R.C. Nanomaterials synthesis, properties and application Institute of Physics Publication.
2. Madou, Fundamentals of microfabrication, Mcgraw Hill.
3. Sibelia, J.P., A Guide to Material characterization, Prentice Hall.
4. Mark Ratner, Daniel Ratner-Nano Technology-A Gentle Introduction to the next big idea.

HUM-457-F **BUSINESS COMMUNICATION**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

The course proposes to help students develop business and technical communication competence. It focuses on writing skills and strategies for specific purposes. The inevitability of introducing this course to Engineering students is embodied in that it has comparatively a high concentration of certain complex writing techniques and procedures.

Section A

Business Correspondence : Characteristics and formats of Business letter; Quotations, Orders, Tenders, Sales letters, claim and adjustment letters, Credit and Collection letters, Application Letters for vacant situations with emphasis on Resumes and Curriculum Vitae; E-mail and Netiquette-format, style and tone.

Section B

Business Reports and Proposals : Importance, Function, Pattern and formats of Reports, Typical Business Reports, Report Organisation and Presentation, and Formal Reports; Proposal Formats, Writing problem-Solving proposals, Executive Summary Proposals and project Proposals.

Section C

Meetings : Writing of Memorandum, Notes, Agenda and minutes of Meeting.

Section D

Public Relations and Advertising Documents: Press Releases, Public Service announcements, Advertising Strategy and its objective, Designing of Classified and Display Advertising copies.

Text Book:

1. Business Communication: Process & Product by Hary Ellen Guffey, IV Edition, South-Western College Publishing, Cincinnati.

2. Business Correspondence and Report Writing by R.C. Sharma & Krishna Mohan, Tata Macgraw Hill Publication, New Delhi.
3. Effective Business English and Correspondence by M.S. Ramesh and C.C. Pattanshetti, R. Chand & Co., New Delhi. 4. Effective Letters in Business by Robert by C. Shruter, Tata Macgraw Hill, New Delhi.
5. English Business Letters by F.W. Wing & D. Anncree, Orient Longman.
6. Written Communication in English by Sarah Freeman, Orient Longman.
7. International Business English by Leo Jones & Richard Alexander, Cambridge University Press.
8. General and Business English by Sweet Stephen, Sir Issac Pitman & Sons Ltd., London.
9. How to Write and Present Technical Information, Charles H. Sides, Cambridge University Press, U.K.
10. Strategies for Engineering Communication, Susan Stevenson Steve Whitmore, John Wiley and Sons, Inc. Printed in India by Replika Press. Pvt. Ltd., Delhi.

CSE-432-F **DIGITAL IMAGE PROCESSING**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction and Fundamental to Digital Image Processing: What is Digital Image Processing, Origin of Digital Image Processing, Examples that use Digital Image Processing, Fundamental steps in Digital Image Processing, Components of Digital Image Processing System, Image sensing and acquisition, Image sampling, quantization and representation, Basic relationship between pixels.

Section-B

Image Enhancement in the Spatial Domain & Frequency domain: Background, Basic gray level transformation, Histogram processing, Basics of spatial filtering, Smoothing and Sharpening Spatial filters, Introduction to Fourier Transform and the Frequency Domain, Discrete Fourier Transform. Smoothing and Sharpening Frequency-Domain filters.

Image Restoration: Image Degradation/Restoration Process, Noise models, Restoration in presence of noise, Inverse Filtering, Minimum Mean Square Filtering, Geometric mean filter, Geometric transformations.

Section-C

Color Image Processing: Color Fundamentals, Color models, Basis of full color image processing, Color transformations.

Image Compression: Fundamentals, Image compression models, Error free compression, Lossy compression.

Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region oriented segmentation.

Section-D

Representation, Description and Recognition: Representation-chain codes, polygonal approximation and skeletons, Boundary descriptors-simple descriptors, shape numbers, Regional descriptors- simple, topological descriptors, Pattern and Pattern classes-Recognition based on matching techniques.

Recognition: Pattern and pattern Classes, Decision-Theoretic Methods.

TEXT BOOK:

1. Digital Image Processing by Rafael C. Gonzalez & Richard E. Woods –2002, Pearson Education.

REFERENCE BOOK:

1. Digital Image Processing by A.K. Jain, 1995,-PHI

CSIT-410 **MOBILE COMPUTING**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction: Wireless communication, Wireless data technologies, Frequencies for radio signals, antennas and signal propagation, need and types of multiplexing techniques, modulation types, use of spread spectrum, cellular systems.

Medium Access Control: Need for MAC algorithm, medium access methods and comparison of these methods.

Section-B

Digital mobile Phone Systems: GSM: mobile services, system architecture, radio interference, protocols, localization and calling, hand over, security, new data services, other digital cellular networks, comparison with GSM.

Section-C

Wireless LAN: Introduction, advantages and design goals for wireless LAN, Infrastructure, ad-hoc networks, IEEE 802.11: system and protocol architecture, physical layer, HIPERLAN protocol architecture and physical layer and MAC, Blue tooth physical and MAC layer. Wireless ad-hoc networks.

Protocols for mobile computing: Mobile network layer, mobile IP, Snooping TCP, Mobile TCP, Fast and selective retransmission and recovery, Transaction oriented TCP.

Section-D

Wireless Application Protocol: WAP architecture wireless datagram protocol, transport layer security, WML, script.

Palm OS: - Architecture, features of kernel, memory, system managers, Symbian OS: Architecture, hardware interface, memory, management, Window CE: features and architecture.

TEXT BOOKS:

1. Mobile Communications – Jachen Schiller (Addison- Wesley)
2. Mobile Computing – Asoke K Talukder, Roopa R Yavgal, (TMH Publishing)

CSIT-402-F CYBER CRIME INVESTIGATIONS AND CYBER FORENSICS

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

Introduction : Review of TCP/IP and TCP, IP Header analysis, Introduction to Cyber World, Cyber attacks and cyber security, Information warfare and cyber terrorism, Types of cyber attacks, Cyber Crime and Digital Fraud, Overview of Types of computer forensics i.e. Media Forensics, Network forensics (internet forensics), Machine forensic, Email forensic (e-mail tracing and investigations)

Section B

Live Data collection and investigating windows environment: windows Registry analysis, Gathering Tools to create a response toolkit (Built in tools like netstat, cmd.exe, nbtstat, arp, md5sum, regdmp etc and tools available as freeware like Fport, Pslist etc), Obtaining volatile Data (tools like coffee, Helix can be used) Computer forensics in windows environment, Log analysis and event viewer, File auditing, identifying rogue machines, hidden files and unauthorized access points

Section C

Live Data collection and investigating Unix/Linux environment: /Proc file system overview, Gathering Tools to create a response toolkit (Built in tools like losetup, Vnode, netstat, df, md5sum, strace etc and tools available as freeware like Encase, Carbonite etc)

Handling Investigations in Unix/Linux Environment: Log Analysis (Network, host, user logging details), Recording incident time/date stamps, Identifying rogue processes, unauthorized access points, unauthorized user/group accounts,

Section D

Forensic tools and report generation: Recovery of Deleted files in windows and UNIX, Analyzing network traffic, sniffers, Ethical Hacking, Hardware forensic tools like Port scanning and vulnerability assessment tools like Nmap, Netscan etc. Password recovery (tools like John the ripper, L0phtcrack, and THC-Hydra), Mobile forensic tools and analysis of called data record Template for computer forensic reports

TEXT BOOKS:

1. Incident Response & Computer Forensics. Mandia, k., Prosise, c., Pepe, m. 2nd edition. Tata-McGraw Hill, 2003.
2. Guide to Computer Forensics and Investigations, 2nd edition, Bill Nelson, Amelia Phillips, Frank Enfinger, and Chris Steuart , Thomson Learning.

REFERENCE BOOKS:

1. Digital Evidence and Computer Crime, 2nd Edition , Eoghan Casey , academic Press File System Forensic Analysis by Brian Carrier, addition Wesley.
2. Windows Forensic Analysis DVD Toolkit (Book with DVD-ROM), Harlan Carvey, syngress Publication.

3 EnCE: The Official EnCase Certified Examiner Study Guide, 2nd Edition, Steve Bunting, sybex Publication.

IT-472-F INTRODUCTION TO VLSI DESIGN

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Crystal Growth: MGS, EGS, Czochralspi crystal Puller, Silicon shaping, Wafer Preparation. Epitaxy: Vapour Phase Epitaxy, Epitaxial Layer evaluation Molcullar Beam Epitaxy.

Oxidation: Thermal Oxidation Kinetics, Oxidation techniques, Oxide Properties, Oxidation induced Defects. Lithography: Photolithography, e-beam lithography, X ray Lithography.

Section-B

Reactive Plasma Etching: Plasma Properties, Feature Size control and anisotropic etching, Plasma etching techniques and equipment. Di-electric and Poly-Silicon Film Deposition: Deposition Processes for Poly-Si, SiO2, SiO3N4; Plasma assisted Depositions.

Section-C

Diffusion: A Qualitative view of atomic diffusion in Solids, diffusion mechanisms, Fick's one dimensional diffusion equation, constant source and limited source diffusion, diffusion of Grp3 and 5 impurities in Silicon Impurity sources, diffusion apparatus, Characterization of diffused layers. Ion Implantation:
Introduction, Range Theory, Implantation Equipment Anncaling.

Section-D

Metallization: Metallization applications, Choices, Physical Vapour Deposition. Sputtcring, Metallization Problems. Assembly & Packaging: Package Types, design considerations, Package fabrication technologies, Future trends.

Isolation techniques: Bipolar IC fabrication Process Sequence. n MOS IC fabrication Process Sequence.

TEXT BOOKS:

1. VLSI Technology, S.M. Sze, 1998, MGH
2. VLSI Fabrication Principles, S.K. Ghandhi

CSE-446-F **NATURAL LANGUAGE PROCESSING**

L T P
33 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Components of natural language processing: lexicography, syntax, semantics, pragmatics: word level representation of natural languages prosoty & natural languages.

Formal languages and grammars: chomsky hierarchy, Left-Associative grammars, ambiguous grammars, resolution of ambiguities.

Section-B

Computation linguistics: recognition and parsing of natural language structures: ATN & RTN,General techniques of parsing: CKY, Earley & Tomitas algorithm.

Section-C

Semantics-knowledge representation semantic networks logic and inference pragmatics, graph models and optimization, prolog for natural language semantic.

Section-D

Application of NLP: intelligent work processors: Machine translation, user interfaces, Man- Machine interfaces, natural language querying, tutoring and authoring systems, speech recognition, commercial use of NLP.

TEXT BOOK:

1. "Natural Language Understanding" James Allen, Benjamin-1995, Cummings Pub. Comp. Ltd.

REFERENCE BOOKS:

1. "Language as a cognitive process", Terry Winograd 1983, AW
2. "Natural Language processing in prolog" G. Gazder, 1989, Addison Wesley.

" Introduction of Formal Language Theory, Mdlj Arbib & Kfaury, 1988, Springer Verlog.

EC-821-F **DIGITAL IC DESIGN**

L T P	Class work Marks: 50
3 1 -	Theory Marks : 100
	Total Marks : 150
	Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction: Digital IC, Digital Combinational and sequent ional circuit, issue in digital IC design, Quality metrics of Digital Design Designing Combinational Logic Gate in CMOS : Static C-MOS Inverter and its characteristics, CMOS Design consideration Transistor Sizing, Power Dissipation, Design Margining, Ratioed Logic, Pass Transistor Logic.

Section-B

Dynamic C-MOS design, basic principle, speed and power Dissipation of Dynamic Logic, Signal Integrity in Dynamic Design, Cascaded Dynamic. Designing Sequential Logic Circuits Introduction ,Static Latches and registrars, Dynamic Latches and Registers, Alternative Register Styles, Pipelining.

Section-C

Implementation Strategies for Digital ICS: Custom, Semi custom Circuit Design, Cell –Based Design Methodology, Array Based Implementation Approach, Layout Designing Memory: Memory Classification, Memory Architecture and Building Block,Read only Memories, Nonvolatile Read Write Memories, Read-Write Memories, Memory Peripheral Circuits.

Section-D

Programmable logic devices: Introduction to PLA, PAL, PLD/CPLD, PGA/ FPGA, ASIC their applications and Architecture.

REFRENCE BOOKS:

1. J.M. Rabaey, A. Chandrakasan and B. Nikolic: Digital Integrated Circuits- A Design Perspective, 2nd ed., PHI, 2003
2. D.A. Pucknell and K. Eshraghian, Basic VLSI Design, PHI, 1995
3. E.D. Fabricius, Introduction to VLSI Design, McGraw Hill, 1991
4. N.H.E. Weste and K. Eshraghian, Principles of CMOS VLSI Design - a System Perspective, 2nd ed., Pearson Education Asia, 2002
5. S.M. Kang and Y. Leblevici, CMOS Digital Integrated Circuits Analysis and Design, 3rd ed., McGraw Hill, 2003
6. J. P. Uyemura, Introduction to VLSI Circuits and Systems, John Wiley & Sons (Asia) Pte Ltd, 2002
7. W. Wolf, Modern VLSI Design - System on Chip design, 3rd ed., Pearson Education, 2004
8. R. Jacob Baker, CMOS Circuit Design, Layout, and Simulation, IEEE Press, 1997

CSE-407-F **NEURAL NETWORKS**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Overview of biological neurons: Structure of biological neurons relevant to ANNs.

Fundamental concepts of Artificial Neural Networks: Models of ANNs; Feedforward & feedback networks; learning rules; Hebbian learning rule, perception learning rule, delta learning rule, Widrow-Hoff learning rule, correction learning rule, Winner –lake all elarning rule, etc.

Section-B

Single layer Perception Classifier: Classification model, Features & Decision regions; training & classification using discrete perceptron, algorithm, single layer continuous perceptron networks for linearly seperable classifications.

Section-C

Multi-layer Feed forward Networks: linearly non-seperable pattern classification, Delta learning rule for multi-perceptron layer, generalized delta learning rule, Error back propagation training, learning factors, Examples.

Single layer feed back Networks: Basic Concepts, Hopfield networks, Training & Examples.

Section-D

Associative memories: Linear Association, Basic Concepts of recurrent Auto associative memory: retrieval algorithm, storage algorithm; by directional associative memory, Architecture, Association encoding & decoding, Stability.

Self organizing networks: UN supervised learning of clusters, winner-take-all learning, recall mode, Initialization of weights, seperability limitations

TEXT BOOK:

1. Introduction to Artificial Neural systems by Jacek M. Zurada, 1994, Jaico Publ. House.

REFERENCE BOOKS:

1. “Neural Networks: A Comprehensive formulation”, Simon Haykin, 1998, AW
2. “Neural Networks”, Kosko, 1992, PHI.
3. “Neural Network Fundamentals” – N.K. Bose, P. Liang, 2002, T.M.H

CSE -305-F ANALYSIS AND DESIGN OF ALGORITHMS

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Brief Review of Graphs, Sets and disjoint sets, union, sorting and searching algorithms and their analysis in terms of space and time complexity.

Divide and Conquer: General method, binary search, merge sort, qick sort, selection sort, Strassen's matrix multiplication algorithms and analysis of algorithms for these problems.

Section-B

Greedy Method: General method, knapsack problem, job sequencing with dead lines, minimum spanning trees, single souce paths and analysis of these problems.

Dynamic Programming: General method, optimal binary search trees, O/I knapsack, the traveling salesperson problem.

Section-C

Back Tracking: General method, 8 queen's problem, graph colouring, Hamiltonian cycles, analysis of these problems.

Branch and Bound: Method, O/I knapsack and traveling salesperson problem, efficiency considerations. Techniques for algebraic problems, some lower bounds on parallel computations.

Section-D

NP Hard and NP Complete Problems: Basic concepts, Cook's theorem, NP hard graph and NP scheduling problems some simplified NP hard problems.

TEXT BOOKS:

1. Fundamental of Computer algorithms, Ellis Horowitz and Sartaj Sahni,1978, Galgotia Publ.,
2. Introduction To Algorithms, Thomas H Cormen, Charles E Leiserson And Ronald L Rivest: 1990, TMH

REFERENCE BOOKS:

1. The Design and Analysis of Computer Algorithm, Aho A.V. Hopcroft J.E., 1974, Addison Wesley.
2. Algorithms-The Construction, Proof and Analysis of Programs, Berlion, P.Bizard, P., 1986. Johan Wiley & Sons,
3. Writing Efficient Programs, Bentley, J.L., PHI
4. Introduction to Design and Analysis of Algorithm, Goodman, S.E. & Hedetnieni, 1997, MGH.
5. Introduction to Computers Science- An algorithms approach , Jean Paul Trembley, Richard B.Bunt, 2002, T.M.H.
6. Fundamentals of Algorithms: The Art of Computer Programming Voll, Knuth, D.E.:1985, Naresh Publ.

EC-812-F SATELLITE COMMUNICATION

L T P	Theory : 100 Marks
3 1 -	Class work: 50 Marks
	Total : 150 Marks

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

PRINCIPLES OF SATELLITE COMMUNICATION : Evolution & growth of communication satellite, Synchronous satellite, Satellite frequency allocation & Band spectrum, Advantages of satellite communication, Active & Passive satellite, Modem & Codec. Applications of satellite communication.

COMMUNICATION SATELLITE LINK DESIGN: Introduction, General link design equations, System noise temperature, C/N & G/T ratio, Atmospheric & Ionospheric effects on link design, Complete link design, Earth station parameters.

Section-B

ANALOG SATELLITE COMMUNICATION: Introduction, Baseband analog(Voice) signal, FDM techniques, S/N & C/N ratio in frequency modulation in satellite link, S/N ratio in FM with multiplexed telephone signal in satellite link, Single channel per carrier(SCPC) systems, Companded single sideband (CSSB) systems, Analog FM/FDM TV satellite link, Intermodulation products & their effects in FM/FDM systems, Energy disposal in FM/FDM systems.

DIGITAL SATELLITE COMMUNICATION : Advantages of digital communication, Elements of digital satellite communication systems, Digital baseband signals, Digital modulation techniques, Satellite digital link design, Time Division Multiplexing.

Section-C

MULTIPLE ACCESS TECHNIQUES: Introduction, TDMA, TDMA-Frame structure, TDMA-Burst structure, TDMA-Frame efficiency, TDMA-superframe, TDMA-Frame acquisition & Synchronization, TDMA compared to FDMA, TDMA Burst Time Plan, Multiple Beam (Satellite switched) TDMA satellite system, Beam Hopping(Transponder Hopping) TDMA, CDMA & hybrid access techniques.

SATELLITE ORBITS: Introduction, Synchronous orbit, Orbital parameters, Satellite location with respect to earth, Look angles, Earth coverage & slant range, Eclipse effect, Satellite placement in geostationary orbit, station keeping, Satellite stabilization.

Section-D

SPECIAL PURPOSE COMMUNICATION SATELLITES: BDS, INMARSAT, INTELSAT, VSAT(data broadband satellite), MSAT(Mobile Satellite Communication technique), Sarsat(Search & Rescue satellite) & LEOs (Lower earth orbit satellite), Satellite communication with respect to Fiber Optic Communication, LANDSAT, Defense satellite.

LASER SATELLITE COMMUNICATION: Introduction, Link analysis, Optical satellite link transmitter, Optical satellite link receiver, Satellite Beam Acquisition, Tracking & Positioning, Deep Space Optical Communication Link

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TEXT BOOK:

1. Satellite Communication: D.C. Aggarwal ; Khanna.

REFERENCE BOOK :

1. Satellite Communication: Gagliardi; CBS

EC-815-F SATELLITE COMMUNICATION LAB

L T P	Theory : 50 Marks
0 0 2	Class work : 50 Marks
	Total : 100Marks

LIST OF EXPERIMENTS:

1. To set up a active and passive satellite communication link and study their difference.
2. To measure the base-band analog (voice) signal parameters in the satellite link.
3. To measure C/N ratio.
4. To transmit and receive the function generator waveforms through a Sat.Com. link.
5. To measure the digital baseband signal parameters in Sat.Com. link.
6. To send telecommand and receive the telemetry data.
7. To set a PC to PC Sat. Com. Link using RS-232 ports.
8. To measure the propagation delay of signal in a Sat. Com. Link.
9. To measure fading of a received signal.
10. To measure the parameters in an analog FM/FDM TV Sat.Com. link.
11. To measure the S/N ratio.
12. To calculate the figure of merit and FM deviation.

NOTE: Ten experiments are to be performed, out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

CSIT-410-F **SEMINAR**

L T P	Class Work Marks:	50
0 0 2	Total Marks:	50

Resume / Report Preparation /Letter writing: Students prepare their own resume and report.

Presentation Skills: Students make presentations on given topics. Every student will be required to present a seminar talk on a topic approved by the department. The committee constituted by the Head of the Department will evaluate the presentation.
Group Discussion: Students participate in group discussions.
Interview Skills: Students participate in Mock interviews.

Note: Classroom sessions are practice sessions.

HUM-451-E LANGUAGE SKILLS FOR ENGINEERS

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

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The real challenge before the students starts when they cross the threshold of the college after completing their degree. They, all of a sudden, find themselves competing for job/P.G. Degrees, through various entrance tests and interviews. Verbal ability forms a major portion of these tests. Without sound language skills and its semantic-syntactic know-how, the students with engineering background find themselves almost under-prepared for such tests. With this difficulty of students in mind, this course is proposed to make them technically proficient in handling the language skills required in competitive exams. The course would expose students to almost all variety of items, the common run of such tests as CAT, GMAT etc. And in the context of LPG, this cutting edge competence becomes imperative, and no professional education can afford to overlook this aspect.

Section A

Remedial English : Parts of speech, Gerunds, Participles and infinitives; Clauses; Sentence-constructions (unity; avoidance of choppy and rambling sentences, logic and consistency, conciseness, sequencing of ideas); Sentence errors-agreement between verb and subject, pronoun and antecedents, sequence of tenses, problems involving modifiers (dangling and misplaced modifiers); Shifts in point of view consistency of number and person, tense, mood, voice and subject; Parallelism; Omissions and mixed constructions.

Section B

Vocabulary : Methods of building vocabulary-etmological roots, prefixes and suffixes; Commonly used foreign words and phrases; spelling; words often confused synonyms and homonyms; one word substitutes; verbal idioms.

Section C

Punctuation and Mechanics: End Punctuation; internal Punctuation; Word Punctuation.
Comprehension: Abstracting; Summarizing; Observation, Findings and Conclusions; Illustration and Inductive Logic; Deduction and Analogy.

Section D

Presentation: Oral presentation- Extempore, discussion on topics of contemporary relevance, Interviews.

TEXT BOOKS:

1. Working with words by R. Gairns and S. Redman, Cambridge University Press, London.
2. Meanings into Words-Upper Intermediate Students Book, Deff/Jones, Foundation Books (Cambridge University Press), Delhi.
3. A Practical English Grammar by A.J. Thomson and A.V. Martinet, OUP, Delhi.
4. Examine your English by Margaret M. Maison, Orient Longman, New Delhi.
5. A Practical Guide to Colloquial Idom by W.J. Ball. Longman.
6. A guide to correct English by L.A. ill, Oxford.
7. Structural Essentials of english by H.whitehall, Longman.
8. Advanced English Practice by B.D. Graver, OUP, Delhi
9. Public Speaking, Sudha Publication Pvt. Ltd., New Delhi.
10. Group Discussion, Sudha Publication Pvt. Ltd., New Delhi.

CSE-442-F **HUMAN COMPUTER INTERACTION**

L T P	Class Work Marks: 50
3 1 0	Exam Marks: 100
	Total Marks: 150
	Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introductions & overview of HCI: History of computer user interfaces, HCI – history and intellectual root Human information processing limitations, human decision making.

1. Human cognitive and sensory limits
2. Human memory
3. Human problem solving
4. Skill acquisition
5. Users' conceptual models (mental models)
6. Decision making

Computer systems and user interfaces, human-system interaction:
Input and output devices, Mechanics of particular devices, Speech input, sound and speech output, Computer architecture, Performance characteristics of humans and systems, Color issues, Computer graphics , Color representation, color maps, color range of devices

Section-B

Interaction models and metaphors:
Use of abstract metaphors for describing interface behavior, Use of metaphors to support user understanding, Dialog input and output techniques and purposes , Screen layout issues, Dialog interaction: types and techniques, navigation and orientation, multimedia and non graphical dialogues.
Dialog issues: response time, control, standards, look and feel , Layers model of architecture of design and windowing systems, Windows manager models, e.g., X, Macintosh, MS Windows, Hypermedia and WWW

Section-C

Principles guiding well-designed human-system interaction: Paradigms for interaction, Principles to support usability, Accounting for users with disabilities
The design process – overview: The typical software development lifecycle (idealized vs. actual), User-centered design overview, "Three pillars of design", Usability engineering overview, Reconciling UCD and usability testing
The design process - task and user needs analysis: Task analysis definition, Techniques for task analysis, Sources of information

Section-D

The design process – making use of task and user data for system design.
Use cases, scenarios, Structuring the information, Information architecture, User and process flows, Wireframes, Mockups, comps, Other methods of conveying structure and function

Designing for universal access: What is accessibility? What is accessible software, Examples of accessibility adaptations, what's driving software accessibility, Implications for software organizations?
Speech user interfaces: Attributes of speech user interfaces, Evaluating speech user interface quality
HCI in mission-critical and high-risk environments: Safety implications of human-computer interaction, Effects of automation, addressing the effects

TEXT BOOKS:

1. Hackos, J.T. & Redish, J.C. (1998). User and task analysis for interface design. John New York: Wiley & Sons.
2. Norman, D. (1988). The design of everyday things. New York: Basic Books.

REFERENCE BOOKS:

1. Designing the User Interface: Strategy for Effective Human Computer Interaction, 3rd edition, Bel Shneiderman, Perason Edu. Publ. 2000.
2. Human Computer Interaction Dix, A et al. Prentice Hall 1993
3. Graphical User Interface Design and Evaluation Redmond-Pyle, D. & Moore, A. Prentice Hall 1995
4. The Art of Human-Computer Interface Design Laurel, B Addison-Wesley 1990

EC-818-F **TELECOMMUNICATION –SWITCHING AND NETWORKS**

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Telecommunications Transmission: Basic Switching System, Simple Tele-phone Communication, evolution of switching systems -Stronger switching systems Switching Used in telecommunications cross bar switching, Electronic Switching – Space Division Switching.

Section-B

Time Division Switching –Time Division space switching, Time Division Time Switching, Time multiplexed space switching, Time multiplexed Time Switching, Combination Switching Control of Switching Systems: Call processing functions, common control, stored program control (For all type of switching systems)

Section-C

Speech Digitization and Transmission: Quantization Noise, Companding, Differential Coding, Vocodors, Pulse Transmission, Line Coding, NRZ and RZ Codes, Manchester Coding, AMI Coding, Walsh Codes, TDM. Traffic Engineering: Grade of Service and Blocking Probabity– Telephone Networks, Subscriber Loops, Switching Hierchy and Routing, Transmission Plans and Systems, Signaling Techniques, In Channel, Common Channel.

Section-D

Telephone Networks and Signaling: Introduction, subscriber loops systems, switching hierarchy, transmission and numbering plans, common channel signaling principles, CCITT signaling systems. Data Networks: Data transmission in PSTNs, Switching Techniques for data transmission, Data communication architecture, Satellite based Data networks.

REFRENCE BOOKS:

1. Flood J E, “Telecommunications switching, traffic and networks” first Indian reprint, Pearson education Asia, (2001).
2. Viswanathan T, “Telecommunication switching systems and networks” 17th Indian reprint, PHI, India, (2003).
3. Bosse J G van, Bosse John G., “Signaling in Telecommunication Networks“ Wiley, John & Sons, (1997).
4. Bruce S. Davie, Paul Doolan, Yakov Rekhtor, “Switching in IP Networks: IP Switching, Tag Switching, and Related Technologies” Elsevier Science & Technology Books, (1998).
5. Joseph Yu Hui, “Switching and Traffic Theory for Integrated Broadband Networks”, Kluwer Academic Publishers, (1990).

EC-819-F **MIXED SIGNAL IC DESIGN**

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction: Introduction to analog VLSI and mixed signal issues in CMOS technologies
MOS transistor: Introduction, Short channel effects, current source and current mirror, C-MOS circuit Basic Integrated Circuit Devices and Modeling: MOS and BJT transistor modeling, CMOS and bipolar processing – CMOS and analog layout consideration MOS and CMOS sample and hold circuit – bipolar and BiCMOS sample and hold – switched capacitor circuits – data converters

Section-B

D/A and A/D converters : introduction A/D and D/A, various type of A/D converter, ADCs, ramp, tracking, dual slope, successive approximation and flash types, Multi-stage flash type ADCs OP-AMP : Op-amp- analysis, approximations and modelling; Ideal op-amp building blocks.

Section-C

Open loop op-amp configurations, Practical op-amp- Offset voltage analysis and compensation, Input bias and offset current analysis and compensation, frequency response, slew rate, Block diagram representations and analysis of configurations using negative feedback, Designing of Op-amp.

Section-D

Specialized IC's: 555 Timer-Monostable, multivibrator, astable multivibrator, Applications and Phase locked loop-Operating principles and applications of PLL.

REFRENCE BOOKS:

1. D. A. Johns and K. Martin, Analog Integrated Circuit Design, Wiley Student Edition, 2002.
2. P. R. Gray and R. G. Meyer, Analysis and design of Analog Integrated circuits 4th Edition, Wiley Student Edition, 2001.
2. R.Jacob Baker,H.W.Li, and D.E. Boyce CMOS Circuit Design ,Layout and Simulation, Prentice-Hall of India,1998
3. Mohammed Ismail and Terri Faiz Analog VLSI Signal and Information Process, McGraw-Hill Book company,1994
4. Paul R. Gray and R.G.Meyer, Analysis and design of Analog Integrated circuits John Wiley and sons,USA,(3rd Edition),1993
5. B. Razavi, RF Microelectronics, Prentice-Hall PTR,1998
6. P. E. Allen and D. R. Holberg, CMOS Analog Circuit Design, 2nd edition, Oxford University Press, 1997.

EC-820-F **LOW POWER DESIGN**

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction to Low-Power VLSI Design, sources of Dissipation in Digital Integrated circuit, Degree of freedom, Recurring Themes in Low power, Low Power Approaches Device and Technology Impact on Low Power Electronics Dynamic Dissipation in CMOS, Effect on speed, Constrictions on Reduction.

Section-B

Transistor Sizing and Gate oxide Thickness, Impact of Technology Scaling Low Power Circuit Techniques Power consumption in circuits, Flip-Flop and Latches.

Section-C

Logic, High Capacitance Nodes Low Power Clock Distribution Power Dissipation in clock Distribution, Single Driver vs Distributed Buffer, Zero Skew vs Tolerable Skew, Chip and Package Co-Design of clock.

Section-D

Logic Synthesis for low power: Power Estimation Technique, power Minimization Technique Low power Memory Design Sources of power dissipation in D-RAM and S-RAM, Low power DRAM circuit, Low power SRAM circuit

REFRENCE BOOKS:

1. Jan M.Rabay and Massoud Pedram “Low Power Design Methodology” Kluwer Academic Publishers 1996
2. Gary K. Yeap, “Practical Low Power Digital VLSI Design”, KAP, 2002
3. Rabaey, Pedram, “Low power design methodologies” Kluwer Academic, 1997
4. Kaushik Roy, Sharat Prasad, “Low-Power CMOS VLSI Circuit Design” Wiley, 2000
5. J.M. Rabaey, A. Chandrakasan and B. Nikolic: Digital Integrated Circuits- A Design Perspective, 2nd ed., PHI, 2003

EC-722-F **BIOINFORMATICS**

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Fundamentals of Bioinformatics and Information Technology: Introduction to bioinformatics, Experimental sources of biological data, publicly available databases, Operating systems - including Windows and UNIX, Networks - including the Intranets and the Internet.

Section-B

Analytical Science and Bioinformatics High throughput sequencing, Experimental determination of protein structures, Gene expression monitoring, Proteomics, Metabolomics Statistical Methods in Bioinformatics Basic mathematics, Vectors and matrices, Multivariate statistics - particularly exploratory methods and pattern recognition Bioinformatics Algorithms and Tools: Visualization of sequence data, Sequence alignment, Homology searching - including BLAST, Gene expression informatics

Section-C

Introduction to gene finding Applications and Commercial Aspects of Bioinformatics: Visualization of sequence data, Drug discovery, Genetic basis of disease, Personalized medicine and gene-based diagnostics, Legal, ethical and commercial ramifications of bioinformatics; Bioinformatics The Business of Research, Research methodology (focusing on computer-based research), Case studies of areas of current bioinformatics research Routes to research funding (academic and commercial), Bioinformatics business models, Intellectual property rights

Section-D

Software Engineering in Bioinformatics: Advanced programming using Java and BioJava, Advanced database work using SQL, Interfacings programs with databases. Data interoperability using XML Principles of Programming and Databases using Java and SQL: Fundamental principles of programming, Object-oriented programming using Java, Introduction to databases using Oracle. PERL programming: Data manipulation, File maintenance, Pipelining Packaging and interfacing system facilities

REFRENCE BOOKS:

1. Bioinformatics for Dummies, Jean-Michel Claverie, Cedric Notredame, 2003, John Wiley & Sons
2. Bioinformatics Computing, Bryan P. Bergeron, 2002, Prentice Hall
3. Introduction to Bioinformatics, Teresa Attwood, David Parry-Smith, 2001, Prentice Hall
4. Beginning Perl for Bioinformatics, James Tisdall, 2001, O'reilly
5. Developing Computer Skills, Cynthia Gibas, PerJambeck, 2001, O'reilly

EC-822-F **ANALOG IC DESIGN**

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Review of MOS Devices: MOS transistor models. NMOS, PMOS, CMOS, Introduction to analog VLSI and mixed signal issues in CMOS technologies Basics of system hardware design methodology Hierarchical design using top-down and bottom-up methodology.

Section-B

Basic Electrical Properties And Circuit Concepts: Basic Electrical Properties of MOS circuits: MOS transistor operation in linear and saturated regions, MOS transistor threshold voltage MOS switch and inverter, latch-up in CMOS inverter; sheet resistance and area capacitances of layers, wiring capacitances MOS models, SPICE Models Circuit Characterization.

Section-C

Performance Estimation: Estimation of R, C, L, Switching Characteristics-delay models. Power dissipation. ; MOSFET scaling - constant-voltage and constant-field scaling CMOS Analog blocks: Current Sources and Voltage references. Differential amplifier and OPAMP design.

Section-D

Practical Aspects and Design Verification Semi-custom and cell library based design. Design of Hardware description languages for high level design. Logic, circuit and layout verification. Analog Testing and Layout issues. Introduction to different tool used in Analog design

REFRENCE BOOKS:

1. Weste N and Eshranghian K, "Principles of CMOS VLSI Design", Pearson Education Asia (2001).
2. Glaser L and Dobberpuhl D, "The Design and Analysis of VLSI Circuits", Addison Wesley (1985).
3. Rabaey J, "Digital Integrated Circuits: Design perspective", Prentice Hall India (1997).
4. Perry D, "VHDL", 2ndEd., McGraw-Hill International (1995).
5. Pucknell D A and Eshraghian K, "Basic VLSI Design", Prentice Hall India, New Delhi (2003).
6. D. A. Johns and K. Martin, Analog Integrated Circuit Design, Wiley Student Edition, 2002
7. P. R. Gray and R. G. Meyer, Analysis and design of Analog Integrated circuits 4th Edition, Wiley Student Edition, 2001.
8. B. Razavi, RF Microelectronics, Prentice-Hall, 1998.
9. P. E. Allen and D. R. Holberg, CMOS Analog Circuit Design, 2nd edition, Oxford University Press, 1997.

EC-823-F **MEMS**

L	T	P
3	1	-

Class work Marks: 50
Theory Marks : 100
Total Marks : 150
Time duration : 3 Hrs

NOTE: For setting up the questions paper, Questions No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common questions, which is compulsory, and one questions from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction to Microelectromechanical Systems (MEMS) and MEMS Fabrication Technologies, Materials and Substrates for MEMS, Processes for Micromachining - Basic Process Tools, Advanced Process Tools MEMS Structure and Systems: General Design Methodology, Techniques for Sensing and Actuation, Passive MEM Structures, Sensors. Actuators, Mechanical Vibrations.

Section-B

Computer-Aided Design of MEMS and tools, Applications of MEMS in RF/Microwave – The MEMS Switch and its Design Consideration.

Section-C

The MEM Resonator and its Design Considerations, Micromachining-Enhanced Planar Microwave Passive Elements. Other MEMS Based RF/Microwave Circuits and Systems

Section-D

Packaging & Reliability for MEMS - Key Design and Packaging Considerations. Die-Attach Processes. Wiring and Interconnects. Types of Packaging Solutions. Reliability and Failure Analysis

REFRENCE BOOKS:

1. Nadim Maluf and Kirt Williams, "An Introduction to Microelectromechanical Systems Engineering", Artech, 2004 Second Edition
2. Hector J. De Los Santos, " Introduction to Microelectromechanical Microwave Systems", Artech, 2004, Second Edition

CSE-444-F **FUZZY LOGIC**

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, a-cuts, Properties of a-cuts, Decomposition, Theorems, Extension Principle,
Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations

Section-B

Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.

Fuzzy Relations: Crisp & Fuzzy Relations, Projections & Cylindric Extensions, Binary Fuzzy Relations, Binary Relations on single set, Equivalence, Compatibility & Ordering Relations, Morphisms, Fuzzy Relation Equations.

Section-C

Possibility Theory: Fuzzy Measures, Evidence & Possibility Theory, Possibility versus Probability Theory.
Fuzzy Logic: Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

Section-D

Uncertainty based Information: Information & Uncertainity, Nonspecificity of Fuzzy & Crisp sets, Fuzziness of Fuzzy Sets.
Applications of Fuzzy Logic in soft computing.

TEXT / REFERENCE BOOKS:

1. Fuzzy Sets, Uncertainty & Information by G.J.Klir & T.A. Folyger, PHI, 1988.
2. Fuzzy sets & Fuzzy logic by G.J.Klir & B.Yuan, PHI, 1995.

CSIT-404 PARALLEL COMPUTATION AND APPLICATIONS

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction to Parallel Processing: Criteria for judging the architecture, Architectural classification schemes, Trends towards parallel processing, Parallelism in uni processor systems, Parallel Computer Structure, Applications of parallel processing Principles of Pipelining - Principles of Linear and non-linear pipelining, classification of pipeline processors, general pipelines and reservation tables, Interleaved memory organization .

Section-B

Structures and algorithms for Array Processors: SIMD array processors: SIMD computer organization, Masking and data routing mechanisms, SIMD interconnection networks: static v/s dynamic, mesh connected ILLIAC network, Barrel Shifter network, Shuffle-exchange and omega network.

Section-C

Multiprocessor Architecture: Functional structures, UMA & NUMA multiprocessors. Interconnection Networks: Time shared or common buses, Bus arbitration algorithm, Cross bar switch and multiport memories, Comparison of multiprocessor interconnection structure, multistage networks for multiprocessors, Algorithm Analysis – Mathematical background, what to analyze, Running time calculation, Logarithms in Running time

Section-D

Algorithm design techniques: Greedy algorithms, Simple Scheduling algorithms, Multiprocessor case, Huffman code analysis, Bin packing algorithms, Back tracking algorithms, Turnpike reconstruction algorithm Parallel processing terminology - Speed up, scaled speed up and parallelizability.

Elementary parallel algorithms: Hypercube SIMD model, Shuffle-exchange SIMD model, 2-D mesh SIMD, UMA multiprocessor, Broadcast Matrix multiplication - Algorithms for Processor arrays, Algorithms for multiprocessors and multicomputers. Sorting - Lower bounds on parallel sorting, Odd-Even transposition sort.

TEXT BOOKS:

1. Kai Hwang and Faye A. Briggs, Computer Architecture and Parallel Processing McGraw Hill Series.
2. Kai Hwang, Advanced Computer Architecture, Parallelism, Scalability, Programmability.
3. Michael J. Quinn, Parallel Computing – Theory and Practice – TMH Publication.
4. Mark Allen Weiss, Data Structures and Algorithm Analysis in C, Benjamin/Cummings Publication.

CSE-403-F SOFTWARE PROJECT MANAGEMENT

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction to Software Project Management (SPM): Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, project as a system, management control, requirement specification, information and control in organization.

Stepwise Project planning: Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/ publicize plan.

Section-B

Project Evaluation & Estimation: Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods, rapid application development, water fall, V-process, spiral models. Prototyping, delivery. Albrecht function point analysis.

Activity planning & Risk Management: Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks.
Risk Management: Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values..

Section-C

Resource allocation &Monitoring the control: Introduction, the nature of resources, identifying resource requirements, scheduling resources creating critical paths, counting

the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence.
Monitoring the control: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control.

Managing contracts and people: Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior,

Section-D

Organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures, conclusion, further exercises.

Software quality: Introduction, the place of software quality in project planning, the importance of software quality, defining software quality, ISO 9126, Practical software quality measures, product versus process quality management, external standards, techniques to help enhance software quality.

Study of Any Software Project Management software: viz Project 2000 or equivalent

TEXT BOOK:

1. Software Project Management (2^{nd} Edition), by Bob Hughes and Mike Cotterell, 1999, TMH.

REFERENCE BOOKS:

1. Software Engineering – A Practitioner's approach, Roger S. Pressman (5^{th} ed), 2001, MGH
2. Software Project Management, Walker Royce, 1998, Addison Wesley.
3. Project Management 2/c. Maylor
4. Managing Global software Projects, Ramesh, 2001, TMH.

IT-471-F MANAGEMENT INFORMATION SYSTEM

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

Foundation of Information System : Introduction to Information System and MIS, Decision support and decision making systems, systems approach, the systems view of business, MIS organization within company, Management information and the systems approach.

Section B

Conceptual system design: Define the problems, set systems objects, establish system constraints, determine information needs determine information sources, develop alternative conceptual design and select one document the system concept, prepare the conceptual design report.

Detailed system design: Inform and involve the organization, aim of detailed design, project management of MIS detailed design, identify dominant and trade of criteria, define the sub systems, sketch the detailed operating sub systems and information flow, determine the degree of automation of each operation, inputs outputs and processing, early system testing, software, hardware and tools propose an organization to operate the system, document the detailed design revisit the manager user.

Section C

Implementation evaluation and maintenance of the MIS : Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files test the system cut-over, document the system, evaluate the MIS control and maintain the system. Pitfalls in MIS development.

Section D

Information Technology: Computer hardware & software, DBMS, RDBMS and Telecommunication.

Advanced Concepts in Information Systems: Enterprise Resources Management (ERP), Supply Chain Management, CRM, Procurement Management System.

Text Books:

- Management Information System by W.S. Jawadekar, 2002, Tata McGraw Hill.
- Information System for Modern Management (3rd edition)- Robert G. Murdick, Loel E. Ross & James R. Claggett. PHI.

Reference Books:

- Management Information System; O Brian; TMH
- Management Information System by Davis Olson Mac Graw Hill.
- Management Information System by Stasllings, (Maxwell Mc Millman Publishers).
- Information System; a Management Perspective; Alter Addison Wesley.
- Introduction to Information System; McGraw Hill.

IT-464-F NETWORK SECURITY & MANAGEMENT

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction: Codes and Ciphers – Some Classifical systems – Stiatistical theory of cipher systems- Complexity theory of crypto systems – Stream ciphers, Block ciphers.
Stream Ciphers: Rotor based system – shift register based systems – Design considerations for stream ciphers – Cryptanalsysis of stream ciphers – Combined eneryption and encoding. Block Ciphers – DES and variant, modes of use of DES.

Section-B

Public key systems – Knacksack systems – RSK – Diffle Hellman Exchange – Authentication and Digital signatures, Elliptic curve based systems.
System Identification and clustering: Cryptology of speech signals – narrow band and wide band systems – Analogue & Digital Systems of speech encryption.

Section-C

Security: Hash function – Authentication: Protocols – Digital Signature standards. Electronics Mail Security – PGP (Pretty Good Privacy) MIME, data Compression technique. IP Security: Architecture, Authentication Leader, Encapsulating security Payload – Key Management. Web security: Secure Socket Layer & Transport Layer security, Secure electronics transactions. Firewalls Design principle, established systems.

Section-D

Telecommunication Network Architecture, TMN management layers, Management information Model, Management servicing and functions, Structure of management information and TMN information model, SNMP v1, SNMP2 & SNMP3, RMON1 & 2, Broadband Network Management (ATM, HFC, DSL), ASN

TEXT BOOKS:

1. Cryprotography and Network Security: Principal & Practices, 2nd Edition by Upper Saddle River, PHI
2. Network Management Principles & Practices by Subramanian, Mani (AWL)
3. SNMP, Stalling, Willian (AWL)

REFERENCE BOOKS:

1. SNMP: A Guide to Network Management (MGH)
2. Telecom Network Management by H.H. Wang (MGH)
3. Network Management by U. Dlack (MGH)

CSE-401-F ADVANCED COMPUTER ARCHITECTURE

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Architecture And Machines: Some definition and terms, interpretation and microprogramming. The instruction set, Basic data types, Instructions, Addressing and Memory. Virtual to real mapping. Basic Instruction Timing.

Time, Area and Instruction Sets: Time, cost-area, technology state of the Art, The Economics of a processor project: A study, Instruction sets, Professor Evaluation Matrix

Section-B

Cache Memory Notion: Basic Notion, Cache Organization, Cache Data, adjusting the data for cache organization, write policies, strategies for line replacement at miss time, Cache Environment, other types of Cache. Split I and D-Caches, on chip caches, two level Caches, write assembly Cache, Cache references per instruction, technology dependent Cache considerations, virtual to real translation, overlapping the T-cycle in V-R Translation, studies. Design summary.

Section-C

Memory System Design: The physical memory, models of simple processor memory interaction, processor memory modeling using queuing theory, open, closed and mixed queue models, waiting time, performance, and buffer size, review and selection of queueing models, processors with cache.

Section-D

Concurrent Processors: Vector Processors, Vector Memory, Multiple Issue Machines, Comparing vector and Multiple Issue processors. Shared Memory Multiprocessors: Basic issues, partitioning, synchronization and coherency, Type of shared Memory multiprocessors, Memory Coherence in shared Memory Multiprocessors.

TEXT BOOKS:

1. Advance computer architecture by Hwang & Briggs, 1993, TMH.
2. Pipelined and Parallel processor design by Michael J. Flynn – 1995, Narosa.

CSE-402-F DISTRIBUTED OPERATING SYSTEM

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction to Distributed System, Goals of Distributed system, Hardware and Software concepts, Design issues. Communication in distributed system: Layered protocols, ATM networks, Client – Server model, Remote Procedure Calls and Group Communication. Middleware and Distributed Operating Systems.

Section-B

Synchronization in Distributed System: Clock synchronization, Mutual Exclusion, Election algorithm, the Bully algorithm, a Ring algorithm, Atomic Transactions, Deadlock in Distributed Systems, Distributed Deadlock Prevention, Distributed Deadlock Detection.

Section-C

Unit-3: Processes and Processors in distributed systems: Threads, System models, Processors Allocation, Scheduling in Distributed System, Real Time Distributed Systems.

Unit-4: Distributed file systems: Distributed file system Design, Distributed file system Implementation, Trends in Distributed file systems.

Section-D

Distributed Shared Memory: What is shared memory, Consistency models, Page based distributed shared memory, shared variables distributed shared memory.

Case study MACH: Introduction to MACH, process management in MACH, communication in MACH, UNIX emulation in MACH.

Text Book:

1. Distributed Operating System – Andrew S. Tanenbaum, PHI.

CH-453-F POLLUTION AND CONTROL

L T P
3 1 0

Class Work Marks: 50
Exam Marks: 100
Total Marks: 150
Duration of Exam: 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

Waster Water & its treatment Processes: Waster-water characteristics, effluent standards, primary treatment, secondary treatment-aerobic (activated sludge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB).

Section B

Air Pollution: Classification of air Pollutants Particulates: Physical characteristics, mode of formation, setting properties, Control measures.
Hydrocarbons : Nature; sources, control Carbon
Monoxide : Source, harmful effects on human health, control measure. Oxides of Sulphur and Nitrogen Sources, effects on human health and plants. Control measure.

Section C

Solid Waste : Types, sources and properties of solid waste, solid waste management-Generation, Collection and techniques for ultimate disposal, Elementary discussion on resource and energy recovery.

Section D

Nuclear Pollution: Elementary treatment of nuclear pollution, metal pollution, noise pollution their effects & control.

Text Books:

1. Environmental Engg. by Howard S. Peavy & Others, MGH International.
2. Metacaf-EDDY-Waste-water engineering revised by George Teholonobus (TMH).
3. Environmental Chemistry by B.K. Sharma, Goel Publishing, Meerut.
4. Environmental Chemistry, A.K. DE, Wiley Eastern.
5. Air Pollution: H.C. Perking-McGraw Hill.