Bachelor of Engineering (Information Technology)

Scheme of studies / Examination

(Semester- 3)

Sl. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P	Total	Theory	Sessional	Practical	Total	
1	MATH-201-E	**Mathematics III**	3	2	-	5	100	50	-	150	3
2	CSE-201 E	**Data Structures & Algorithms CSE,EL,IT**	3	1	-	4	100	50	-	150	3
3	CSE-203 E	**Discrete Structures CSE,IT**	3	1	-	4	100	50	-	150	3
4	EE-217-E	**Digital & Analog Communication (IT,CSE)**	3	1	-	4	100	50	-	150	3
5	EE-204-E	**Digital Electronics (EL,EE,IT,CSE,ELI&C)**	3	1	-	4	100	50	-	150	3
6	HUM-201-E	**Economics**	3	1	-	4	100	50	-	150	3
7	IT-201 E	**PC Lab.**	-	-	2	2	-	25	25	50	3
8	CSE-205 E	**Data Structures & Algorithms Lab**	-	-	2	2	-	25	25	50	3
9	EE-224-E	**Digital Electronics Lab (EL,EE,IT,CSE,ELI&C)**	-	-	2	2	-	25	25	50	3
		TOTAL	**18**	**7**	**6**	**31**	**600**	**375**	**75**	**1050**	

Bachelor of Engineering (Information Technology)
Scheme of studies / Examination

(Semester- 4)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P	Total	Theory	Sessional	Practical	Total	
1	CSE-202 E	**Data Base Management Systems (CSE,IT)**	3	1	-	4	100	50	-	150	3
2	CSE-204 E	**Programming Languages (CSE,IT)**	3	1	-	4	100	50	-	150	3
3	CSE-208 E	**Internet Fundamentals (CSE,IT)**	3	1	-	4	100	50	-	150	3
4	IT-202 E	**Object Oriented Programming using C++ (CSE,IT)**	3	1	-	4	100	50	-	150	3
5	CSE-210 E	**Computer Architecture & Organization Common with IV-sem CSE, & V-Sem EL**	3	1	-	4	100	50	-	150	3
6	IT-204 E	**Multimedia Technologies (Common with CSE – V Sem.)**	3	1	-	4	100	50	-	150	3
7	CSE-212 E	**Data Base Management Systems Lab. (CSE,IT)**	-	-	2	2	-	25	25	50	3
8	IT-206 E	**C++ Programming Lab. (CSE,IT)**	-	-	2	2	-	25	25	50	3
9	IT-208 E	**Multimedia Technologies Lab (Common with CSE – V Sem.)**	-		2	2	-	25	25	50	3
10	CSE-214 E	**Internet Lab. (CSE,IT)**	-	-	2	2	-	25	25	50	3
		TOTAL	**18**	**6**	**8**	**32**	**600**	**400**	**100**	**1100**	**-**

Note: During the vacation following this 4th semester, candidates will carry out self study of **Open Source Software** available on the internet and will complete a 'mini project' based upon this study. This project will be evaluated in the 5th semester.

Bachelor of Engineering (Information Technology)

Scheme of studies / Examination

(Semester- 5)

Sl. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P	Total	Theory	Sessional	Practical	Total	
1	IT-301 E	Rapid Application Development	3	1		4	100	50	-	150	3
2	IT-303E	System Programming & System Administration (Common with CSE – VIth Sem)	3	1	-	4	100	50	-	150	3
3	IT-305E	Computer Networks (Common with CSE & EL– VIth Sem)	3	1	-	4	100	50	-	150	3
4	CSE-301 E	Principles of Operating System (CSE,IT)	3	1	-	4	100	50	-	150	3
5	EE- 309-E	Microprocessor & Interfacing (EL,EE,CSE,IT,ELI&C)	3	1	-	4	100	50	-	150	3
6	CSE-303 E	Computer Graphics (CSE,IT)	3	1	-	4	100	50	-	150	3
7	IT-307	Rapid Application Development Lab (CSE,IT)	-	-	2	2	-	25	25	50	3
8	CSE-309 E	Computer Graphics Lab (CSE,IT)	-	-	2	2	-	25	25	50	3
9	CSE-308 E	Operating Systems Lab. (Common with CSE – VI Sem)	-	-	2	2	-	25	25	50	3
10	EE-329- E	Microprocessor & Interfacing Lab. (CSE,IT,EE,EL,ELI&C)	-	-	2	2	-	25	25	50	3
11	IT-309	Assessment of Mini-Project based upon Open Source Software carried out at the end of 4th semester.	-	-	-	-	-	25	-	25	3
		TOTAL	**18**	**6**	**8**	**32**	**600**	**425**	**100**	**1125**	

Bachelor of Engineering (Information Technology)

Scheme of studies / Examination

(Semester- 6)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P	Total	Theory	Sessional	Practical	Total	
1	IT-302 E	Network Programming	3	1		4	100	50	-	150	3
2	CSE-302 E	Principles of Software Engineering (CSE,IT)	3	1	-	4	100	50	-	150	3
3	CSE-304 E	Intelligent Systems (CSE,IT)	3	1	-	4	100	50	-	150	3
4	CSE-307 E	Web Development (Common with CSE – V Sem,)	3	1	-	4	100	50	-	150	3
5	EE-402-E	Wireless Communication (Common with 8th Sem– EL)	3	1	-	4	100	50	-	150	3
6	EE-407-E	Digital Signal Processing (Common with VII-sem ELI&C) (CSE - Elective)	3	1	-	4	100	50	-	150	3
7	IT-304 E	Network Programming Lab. (EL,IT)	-	-	2	2	-	25	25	50	3
8	CSE-306 E	Intelligent Systems Lab. (CSE,IT)	-	-	2	2	-	25	25	50	3
9	CSE-311 E	Web Development & Core JAVA Lab. (Common with V Sem – CSE)	-	-	2	2	-	25	25	50	3
		TOTAL	**18**	**6**	**6**	**30**	**600**	**375**	**75**	**1050**	**-**

Note: During the vacation period following this semester, the student will carry out self study of **.net** technology and will implement a 'mini-project' based upon this study. This project will be evaluated in the coming 7th semester.

Bachelor of Engineering (Information Technology)

Scheme of studies / Examination

(Semester- 7)

Sl. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P	Total	Theory	Sessional	Practical	Total	
1	IT-401 E	Data Warehousing & Data Mining	3	1	-	4	100	50	-	150	**3**
2	CSE-403 E	Software Project Management (CSE,IT)	3	1	-	4	100	50	-	150	**3**
3	IT-403 E	System & Network Administration	3	1	-	4	100	50	-	150	**3**
4		ELECTIVES 1	4	-	-	4	100	50	-	150	**3**
5		ELECTIVES 2	4	-	-	4	100	50	-	150	**3**
6	IT-405 E	System & Network Administration Lab.	-	-	3	3	-	50	50	100	**3**
7	IT-407 E	Advanced JAVA Lab. (Common with CSE – VIII Sem)	-	-	3	3	-	50	50	100	**3**
8	IT-409 E	Major PROJECT – Part I	-	-	4	4	-	50	-	50	
		OR									
	IT-411 E	INDUSTRIAL PROJECT – Part I									
9	IT-413 E	Assessment of Mini-Project based upon **.net** technology carried out at the end of 6th semester.	-	-	-	-	-	25	-	25	-
		TOTAL	**17**	**3**	**10**	**30**	**500**	**425**	**100**		**1025**

1. 'Major Project- Part I' will commence in 7th semester where students will identify the project problem, complete the design, procure the software/books needed. The project will be completed in 8th semester along with its examinations.

ELECTIVES-1

CSE-417 E Data Network Design
CSE-419E Neural Networks
IT-465 E Network Technology
EE-310-E Digital System Design
CSE-421 E Advanced Database Management Systems
CSE-423 E Object Oriented Software Engineering
HUM-451-E Language Skills for Engineers
MATH-451-E Combinatories & Graph Theory
HUM-455-E Entrepreneurship

ELECTIVES-2

CSE-401 E Advanced Computer Architecture
IT-467- E Computer Software Testing
IT-469-E Introduction to E-commerce & ERP
CSE-425 E Natural Language Processing
IT-471- E Management Information system
CSE-405 E Compiler Design
HUM-453-E Oral Communication Competence

MATH-455-E Linear Algebra
CH-451-E Environmental Science & Engineering

Bachelor of Engineering (Information Technology)
Scheme of studies / Examination

(Semester- 8)

Sl. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P	Total	Theory	Sessional	Practical	Total	
1	CSE-402 E	Distributed Operating System (CSE,IT)	3	1	-	4	100	50	-	150	**3**
2	IT-402 E	Security of Information Systems (CSE,IT)	3	1	-	4	100	50	-	150	**3**
3		ELECTIVES 3	4	-	-	4	100	50	-	150	**3**
4		ELECTIVES 4	4	-	-	4	100	50	-	150	**3**
5	IT-404 E	Computer Animation Lab.	-	-	3	3	-	50	50	100	**3**
6	IT-406 E	Major PROJECT - Part II	-	-	6	6	-	100	100	200	**3**
		OR									
	IT-408 E	INDUSTRIAL PROJECT – Part II									
7	IT-410 E	Colloquium	-	-	2	2	-	50	-	50	
8	IT-412 E	General Fitness for the Profession	-	-	-	-	-	50	50	100	3
		TOTAL	**14**	**2**	**11**	**27**	**400**	**450**	**200**	**1050**	

ELECTIVES-3

IT- 464-E Network Security & Management
CSE-412-E Object Oriented Systems Development
IT-466-E Embedded system Design
IT-468-E Logic & Functional Programming
CSE-414-E Digital Image Processing
PHY-452-E Laser Technology
HUM-456-E Marketing Management
MATH-202-E Numerical Methods

ELECTIVES-4

HUM-202-E Fundamentals of Management
IT-470 E Web Engineering
MATH-402-E Operations Research
IT-472 E Introduction to VLSI Design
CSE-416 E Social and Professional Issues in IT
CSE 418 E Human computer Interaction
CSE 420 E Fuzzy Logic

MATH-201-E **MATHEMATICS-III**

(COMMON FOR ALL BRANCHES)

L	T	P			
3	2	-	Class Work	:	50 Marks
			Exam.	:	100 Marks
			Total	:	150 Marks
			Duration of exam.	:	3 Hours

Part-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.

Part-B

Functions of Complex Variable : Definition, Exponential function, Trignometric and Hyperbolic functions, Logrithmic functions. Limit and Continuity of a function, Differnetiability 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.

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).

Part-C

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.

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. Advanced Engg. Mathematics : F Kreyszig.
2. 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 and statistics for Engineers : Johnson. PHI.

Note: Examiner will set eight questions, taking two from Part-A, three from Part-B and three from Part-C. Students will be required to attempt five question taking atleast one from each part.

CSE-201 E **Data Structures & Algorithms**
(CSE,EL,IT)

L	T	P
3	1	-

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

Unit-1: Introduction to Data Structures: Definition of data structures and abstract data types, Static and Dynamic implementations, Examples and real life applications; The Stacks : Definition, Array based implementation of stacks, Linked List based implementation of stacks, Examples: Infix, postfix, prefix representation, Conversions, Applications.

Unit-2: Queues and Lists: Definition, Array based implementation of Queues / Lists, Linked List implementation of Queues / Lists, Circular implementation of Queues and Singly linked Lists, Straight / circular implementation of doubly linked Queues / Lists, Priority Queues, Applications.

Unit-3: Trees: Definition of trees and Binary trees, Properties of Binary trees and Implementation, Binary Traversal pre-order, post order, In- order traversal, Binary Search Trees, Implementations, Threaded trees, Balanced multi way search trees, AVL Trees, Implementations

Unit-4: Graphs: Definition of Undirected and Directed Graphs and Networks, The Array based implementation of graphs, Adjacency matrix, path matrix implementation, The Linked List representation of graphs, Shortest path Algorithm, Graph Traversal – Breadth first Traversal, Depth first Traversal, Tables : Definition, Hash function, Implementations and Applications.

Unit-5: Running time: Time Complexity, Big – Oh - notation, Running Times, Best Case, Worst Case, Average Case, Factors depends on running time, Introduction to Recursion, Divide and Conquer Algorithm, Evaluating time Complexity.

Unit-6: Sorting Algorithms: Introduction, Sorting by exchange, selection, insertions: Bubble sort, Straight selection sort, Efficiency of above algorithms,; Shell sort, Performance of shell sort, Merge sort, Merging of sorted arrays& Algorithms; Quick sort Algorithm analysis,

Heap sort: Heap Construction, Heap sort, bottom – up, Top – down Heap sort approach;

Searching Algorithms: Straight Sequential Search, Binary Search (recursive & non–recursive Algorithms)

Text Book:

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

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.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-203E **Discrete Structures**

L	T	P
3	1	-

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

Unit-1: Set Theory: 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

Unit-2: Propositional Calculus: Basic operations: AND(^), OR(v), NOT(~), Truth value of a compound statement, propositions, tautologies, contradictions.

Unit–3: Techniques Of Counting: Permutations with and without repetition, Combination.

Unit-4: Recursion And Recurrence Relation : 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.

Unit-5: Algebric Structures Definition and examples of a monoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem

Unit-6: Graphs And Trees: Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, 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:

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

Reference Books:

- Discrete Mathematics by Johnson Bough R., 5th Edition, PEA, 2001..
- Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.
- Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press.
- Applied Discrete Structures for Computer Science, Doerr and Levasseur, (Chicago: 1985,SRA
- Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold, London,
- Schaums Outline series: Theory and problems of Probability by S. Lipshutz, 1982, McGraw-Hill Singapore
- Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI
- Discrete Mathematical Structures with Applications to Computers by Tembley & Manohar, 1995, Mc Graw Hill.
- **Note:** Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

EE-217E **Digital and Analog Communication (CSE,IT)**

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

Unit-1: Communication system components: Introduction to Communication: Definition & means of communications; Digital and analog signals: sign waves, square waves; Properties of signals: amplitude, frequency, phase; Theoretical basis for data communication: Fourier analysis: Fourier series and Fourier Transform (property, ESD, PSD and Raleigh) effect of limited bandwidth on digital signal.

Unit-2: Data Transmission System: Physical connections: modulation, amplitude-, frequency-, phase- modulation; Data encoding: binary encoding (NRZ), Manchester encoding, differential Manchester encoding.
Transmission Media: Twisted pair-, co-axial-, fiber optic-cables, wireless media Transmission impairments: attenuation, limited bandwidth of the channels, delay distortion, noise, data rate of the channels (Nyquist theorem, Shannon limit). Physical layer interfaces: RS 232, X.21

Unit-3: Standards in data communications: Communication modes: simplex, half duplex, full duplex; Transmission modes: serial-, parallel-transmission; Synchronizations: Asynchronous-, synchronous-transmission; Type of services: connection oriented-, connectionless-services; Flow control: unrestricted simplex protocol, simplex stop- and -wait protocol, sliding window protocol; Switching systems: circuit switching; picketing switching: data gram , virtual circuits, permanent virtual circuits.

Telephone Systems: PSTN, ISDN, asynchronous digital subscriber line.
Multiplexing: frequency division-, time-, wave- division multiplexing

Unit-4: Security in data communications: Transmission errors: feedback-, forward-error control approaches; Error detection; Parity check, block sum check, frame check sequences; Error correction: hamming codes, cyclic redundancy check; Data encryption: secret key cryptography, public key cryptograph; Data compression: run length encoding, Huffman encoding.

Text Book:

- Data Communications, Computer Networks and Open Systems Halsall Fred, (4th editon) 2000, Addison Wesley, Low Price edition
- **Reference Books:**
- Business Data Communications, Fitzgerald Jerry, 7th Ed. New York, 2001, JW&S,
- Communication Systems, 4th Edi, by A. Bruce Carlson, Paul B. Crilly, Janet C. Rutledge, 2002, TMH.
- Data Communications, Computer Networks and Open Systems, Halsall Fred, 1996, AW.
- Digital Communications, J.G. Proakiss, 4th Ed., MGH
- Satellite Communication, Pratt, John Wiley
- Data & Computer Communications, W.Stallings PHI
- Digital & Data Communication systems, Roden 1992, PHI,
- Introduction to Digital & Data Communications, Miller Jaico Pub.
- Data Communications and Networking, Behrouz A. Forouzan, 2003, 2nd Edition, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

EE-204-E **DIGITAL ELECTRONICS**

L T P			
3 1 0	CLASS WORK	:	50
	EXAM	:	100
	TOTAL	:	150
	DURATION OF EXAM	:	3 HRS

UNIT 1 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.

UNIT 2 COMBINATIONAL DESIGN USING GATES:
Design using gates, Karnaugh map and Quine Mcluskey methods of simplification.

UNIT 3 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.

UNIT 4 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.

UNIT 5 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.

UNIT 6 A/D AND D/A CONVERTERS:
Sample and hold circuit, weighted resistor and R-2R 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.

UNIT 7 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.

NOTE : Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

HUM-201-E **ECONOMICS**

(COMMON FOR ALL BRANCHES)

L	T	P
3	1	-

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

COURSE OBJECTIVE : The purpose of this course is to :

1. Acquaint the student in the basic economic concepts and their operational significance and
2. Stimulate him to think systematically and objectively about contemporary economic problems.

UNIT-I

Definition of Economics - various definitions, Nature of Economic problem, Production possibility curve Economic laws and their nature. Relation between Science, Engineering, Technology and Economics.

UNIT-II

Concepts and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility - its practical application and importance.

UNIT-III

Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve, Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & applications of the concept of elasticity of demand.

UNIT-IV

Meaning of production and factors of production; Law of variable proportions, Returns to scale, Internal and External economics and diseconomies of scale.

Various concepts of cost - Fixed cost, variable cost, average cost, marginal cost, money cost, real cost opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

UNIT-V

Meaning of Market, Types of Market - Perfect Competition, Monopoly, Oligoply, Monoplistic Competition (Main features of these markets)

Supply and Law of Supply, Role of Demand & Supply in Price Determinition and effect of changes in demand and supply on prices.

UNIT-VI

Nature and characteristics of Indian economy (brief and elementary introduction), Privatization - meaning, merits and demerits. Globalisation of Indian economy - merits and demerits. Elementary Concepts of VAT, WTO, GATT & TRIPS agreement.

Books Recommended :

TEXT BOOKS :

1. Principles of Economics: P.N. Chopra (Kalyani Publishers).
2. Modern Economic Theory – K.K. Dewett (S.Chand)

REFERENCE BOOKS:

1. A Text Book of Economic Theory Stonier and Hague (Longman's Landon)
2. Micro Economic Theory – M.L. Jhingan (S.Chand)
3. Micro Economic Theory - H.L. Ahuja (S.Chand)
4. Modern Micro Economics : S.K. Mishra (Pragati Publications)
5. Economic Theory - A.B.N. Kulkarni & A.B. Kalkundrikar (R.Chand & Co.)
6. Indian Economy : Rudar Dutt & K.P.M. Sundhram

NOTE: Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

IT-201 E PC Lab.

L	T	P
-	-	2

Class Work: 25
Exam: 25
Total: 50
Duration of Exam: 3 Hrs.

PC Software: Application of basics of MS Word 2000, MS Excel 2000, MS Power Point 2000, MS Access 2000.

1. To prepare the Your Bio Data using MS Word
2. To prepare the list of marks obtained by students in different subjects and show with the help of chart/graph the average, min and max marks in each subject.
3. Preapare a presentation explaining the facilities/infrastructure available in your college/institute.
4. Create a database of books in the library on a mini scale w.r.t. Computers and manipulate the database using different forms and reports.

PC Hardware:

1. To check and measure various supply voltages of PC.
2. To make comparative study of motherboards.
3. To observe and study various cables, connections and parts used in computer communication.
4. To study various cards used in a system viz. display card, LAN card etc.
5. To remove, study and replace floppy disk drive.
6. To remove, study and replace hard disk.
7. To remove, study and replace CD ROM drive.
8. To study monitor, its circuitry and various presents and some elementary fault detection.
9. To study printer assembly and elementary fault detection of DMP and laser printers.
10. To observe various cables and connectors used in networking.
11. To study parts of keyboard and mouse.
12. To assemble a PC.
13. Troubleshooting exercises related to various components of computer like monitor, drives, memory and printers etc.

Reference Books:

a. Complete PC upgrade & maintenance guide, Mark Mines, BPB publ.
b. PC Hardware: The complete reference, Craig Zacker & John Rouske, TMH
c. Upgrading and Repairing PCs, Scott Mueller, 1999, PHI,

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

CSE-205E **Data Structures & Algorithms Lab.**

L	T	P	Class Work: 25
-	-	2	Exam: 25
			Total: 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.

EE-224-E **DIGITAL ELECTRONICS LAB**

L T P			
0 0 2	CLASS WORK	:	25
	EXAM	:	25
	TOTAL	:	50
	DURATION OF EXAM	:	3 HRS

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 : At least ten experiments are to be performed, atleast 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-202 E Database Management Systems

L	T	P
3	1	-

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

Unit–1: Introduction 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,

Unit-2: Introduction to Client/Server architecture, Three levels architecture of Database Systems, E-R Diagram (Entity Relationship), mapping Constraints, Keys, Reduction of E-R diagram into tables.

Unit-3: File Organisation: Sequential Files, index sequential files, direct files, Hashing, B-trees Index files.

Unit-4: Relational Model, Relational Algebra & various operations, Relational and Tuple calculus.

Unit-5: 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)

Unit-6: Introduction to Distributed Data processing, parallel Databases, data mining & data warehousing, network model & hierarchical model, Introduction to Concurrency control and Recovery systems.

Text Books:

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

Reference Books:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-204E Programming Languages

L	T	P
3	1	-

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

Unit-1: Introduction: Syntactic and semantic rules of a Programming language, Characteristics of a good programming language, Programming language translators compiler & interpreters , Elementary data types – data objects, variable & constants, data types, Specification & implementation of elementary data types, Declarations ,type checking & type conversions , Assignment & initialization, Numeric data types, enumerations, Booleans & characters.

Unit-2: Structured data objects : Structured data objects & data types , specification & implementation of structured data types, Declaration & type checking of data structure ,vector & arrays, records Character strings, variable size data structures , Union, pointer & programmer defined data objects, sets, files.

Unit-3: Subprograms and Programmer Defined Data Types: Evolution of data type concept ,abstraction, encapsulation & information hiding , Subprograms ,type definitions, abstract data types.

Unit–4: Sequence Control: Implicit & explicit sequence control ,sequence control within expressions, sequence control within statement, Subprogram sequence control: simple call return ,recursive subprograms, Exception & exception handlers, co routines, sequence control .

Unit-5: Data Control: Names & referencing environment, static & dynamic scope, block structure, Local data & local referencing environment, Shared data: dynamic & static scope. Parameter & parameter transmission schemes.

Unit-6: Storage Management: Major run time elements requiring storage ,programmer and system controlled storage management & phases , Static storage management , Stack based storage management, Heap storage management ,variable & fixed size elements.

Unit-7: Programming Languages: Introduction to procedural, non-procedural ,structured, functional and object oriented programming language, Comparison of C & C++ programming languages.

Text Book:

- **P**rogramming languages Design & implementation by T.W. .Pratt, 1996, Prentice Hall Pub.
- Programming Languages – Principles and Paradigms by Allen Tucker & Robert Noonan, 2002, TMH,

Reference Books:

- Fundamentals of Programming languages by Ellis Horowitz, 1984, Galgotia publications (Springer Verlag),
- Programming languages concepts by C. Ghezzi, 1989, Wiley Publications.,
- Programming Languages – Principles and Pradigms Allen Tucker , Robert Noonan 2002, T.M.H.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-208E **Internet Fundamentals**

L	T	P
3	1	-

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

Unit-1: Electronic Mail: 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.

Unit-2 : The Internet: 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.

Unit-3 : 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.

Unit-4: Languages: Basic and advanced HTML, java script language, Client and Server Side Programming in java script. Forms and data in java script, XML basics.

Unit-5 : Servers : Introduction to Web Servers: PWS, IIS, Apache; Microsoft Personal Web Server. Accessing & using these servers.

Unit-6: 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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-202 E **Object Oriented Programming Using C++**

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

Unit–1: Introduction to C++, C++ Standard Library, Basics of a Typical C++ Environment, Pre-processors Directives, Illustrative Simple C++ Programs. Header Files and Namespaces, library files.

Unit-2: Object Oriented Concepts : 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.

Unit–3: 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.

Unit-4: Operator Overloading: Introduction, Fundamentals of Operator Overloading, Restrictions On Operators Overloading, Operator Functions as Class Members vs. as Friend Functions, Overloading, <<, >> Overloading Unary Operators, Overloading Binary Operators.

Unit-5: Inheritance: Introduction, 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.

Unit–6 Virtual Functions and Polymorphism: Introduction to Virtual Functions, Abstract Base Classes And Concrete Classes, Polymorphism, New Classes And Dynamic Binding, Virtual Destructors, Polymorphism, Dynamic Binding.

Unit-7: Files and I/O Streams: 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.

Unit-8 Templates & Exception Handling: 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.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE- 210E **Computer Architecture & Organization**

L	T	P
3	1	-

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

Unit-1: Basic Principles: Boolean algebra and Logic gates, Combinational logic blocks(Adders, Multiplexers, Encoders, de-coder), Sequential logic blocks(Latches, Flip-Flops, Registers, Counters)

Unit-2: General System Architecture: 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.

Unit-3: 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.

Unit-4: Basic non pipelined CPU Architecture: 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.

Unit-5: Memory Hierarchy & I/O Techniques: 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.

Unit-6: Introduction to Parallelism: 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).

Unit-7: Computer Organization [80x86]: 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:

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

Reference Books:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-204 E **Multimedia Technologies**

L	T	P
3	1	-

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

Unit-1: Basics of Multimedia Technology: Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD-Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools; LANs and multimedia; internet, World Wide Web & multimedia distribution network-ATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.

Unit-2: Image Compression & Standards: Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.

Unit-3: Audio & Video: Digital representation of sound; time domain sampled representation; method of encoding the analog signals; subband coding; fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadraphonic signal processing; editing sampled sound; MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.

Unit-4: Virtual Reality: Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems.
Applications of environment in various fields.

Text Books:

- An introduction, Villamil & Molina, Multimedia Mc Milan, 1997
- multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

Reference Books:

- Multimedia: Production, planning and delivery, Villamil & Molina,Que, 1997
- Multimedia on the PC, Sinclair,BPB
- Multimedia: Making it work, Tay Vaughan, fifth edition, 1994, TMH.
- Multimedia in Action by James E Shuman, 1997, Wadsworth Publ.,
- Multimedia in Practice by Jeff coate Judith, 1995,PHI.
- Multimedia Systems by Koegel, AWL
- Multimedia Making it Work by Vaughar, etl.
- Multimedia Systems by John.F. Koegel, 2001, Buford.
- Multimedia Communications by Halsall & Fred, 2001,AW.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE- 212E **Database Management Systems Lab**

L	T	P	Class Work: 25
-	-	2	Exam: 25
			Total: 50
			Duration of Exam: 3 Hrs.

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

1. Add a record in the database
2. Delete a record in the database
3. Modify the record in the database
4. Generate queries
5. Generate the report
6. List all the records of database in ascending order.

II Develop a menu driven project for management of database system:

1. Library information system
   (a) Engineering
   (b) MCA

2. Inventory control system
   (c) Computer Lab
   (d) College Store

3. Student information system
   (e) Academic
   (f) Finance

4. Time table development system
   (g) CSE, IT & MCA Departments
   (h) 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.

IT-206 E **C ++ Programming Lab.**

L	T	P
-	-	2

Class Work: 25
Exam: 25
Total: 50
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

Q 3. 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, 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

Q 5. 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 for the class 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.

Q 6. 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.

Q 7. 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.

Q 8. 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.

Q 9. 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).

Q 10. 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 string 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 tollBooth. 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 firstThat( ) 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

IT-208 E **Multimedia Technologies Lab.**

L	T	P	Class Work: 25
-	-	2	Exam: 25
			Total: 50
			Duration of Exam: 3 Hrs.

1. Write a program to justify a text entered by the user on both the left and right hand side. For example, the test " An architect may have a graphics program to draw an entire building but be interested in only ground floor", can be justified in 30 columns as shown below. An architect may have a Graphics programs draw an Entric building but be interested in only ground floor.

2. Study the notes of a piano and stimulate them using the key board and store them in a file.

3. Write a program to read a paragraph and store it to a file name suggested by the author.

4. Devise a routine to produce the animation effect of a square transforming to a triangle and then to a circle.

5. Write a program to show a bitmap image on your computer screen.

6. Create a web page for a clothing company which contains all the details of that company and at-least five links to other web pages.

7. Write a program by which we can split mpeg video into smaller pieces for the purpose of sending it over the web or by small capacity floppy diskettes and then joining them at the destination.

8. Write a program to simulate the game of pool table.

9. Write a program to simulate the game Mine Sweeper.

10. Write a program to play "wave" or "midi" format sound files.

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

CSE 214E Internet Lab.

L	T	P
-	-	2

Class Work: 25
Exam: 25
Total: 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 exercises to be given by the teacher concerned.

IT-301 E **Rapid Application Development**

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

Unit-1: Visual Programming Environment: Concept of procedure and event oriented languages, Integrated Development Environment for VC++ and Visual Basic, Components of Visual C++ and Visual Basic.

Unit-2 Parts of Visual C++ Program: Application object, main window object, view object, document object, Document-View architecture and its advantages, dEvent oriented windows Programming, device context, Microsoft Foundation Classes- an Overview, Simple MFC application, API's.

Unit-3 Reading keystrokes, handling mouse, creating menus, toolbars, buttons, status bar prompts, dialog box, check box, radio buttons, list boxes, combo boxes, sliders, multiple documents.

Unit-4: Serialization, file handling, debugging.

Unit-5: DLL's, OLE Object Technologies, Creating Internet Programs using Visual C++ and Visual Basic, Creating Active X Controls, connecting to Database (using DAO/ADO/RDO) using Visual Basic and Visual C++.

Text Books

- Microsoft Visual C++ By Steven Holzner (Pub: BPB)
- Visual C++ Programming, 2nd edition by Steven Holzner(Pub: PHI)
- Using Visual Basic for Applications By Paul Sanna(Pub: PHI)
- Visual Basic Programming By Steven Holzner
- MSDN Help

Reference Books

- Visual C++: From the ground Up By Mucller (Pub:TMH)
- Programming Visual C++ by David J. Kruglinski

IT-303E Systems Programming &System Administration

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

Unit-1: Evolution of Components Systems Programming, Assemblers, Loaders, Linkers, Macros, Compilers. software tools, Text editors, Interpreters and program generators, Debug Monitors, Programming environment.

Unit-2: Compiler: Brief overview of compilation process, Incremental compiler, Assembler: Problem statement, single phase and two phase assembler, symbol table; Loader schemes, compile and go Loader, general loader schemes, absolute loader, Subroutine linkage, Reallocating loader, Direct linkage Loader, Binders, Linking loader, overlays.

Unit-3: *Macro language and macro-processor, macro instructions, features of macro facility, macro instruction arguments, conditional macro expansion, macro calls with macro instruction defining macros.*

Unit-4: Theoretical Concept of Unix Operating System: Basic features of operating system; File structure: CPU scheduling; Memory management: swapping, demand paging; file system: block and fragments, inodes, directory structure; User to user communication.

Unit-5: Getting Started with Unix: User names and groups, logging in; Format of Unix commands; Changing your password; Characters with special meaning; Unix documentation; Files and directories; Current directory, looking at the directory contents, absolute and relative pathnames, some Unix directories and files; Looking at the file contents; File permissions; basic operation on files; changing permission modes; Standard files, standard output; Standard input, standard error; filters and pipelines; Processes; finding out about processes; Stopping background process; Unix editor vi.

Unit-6: Test Manipulation: Inspecting files; File statistics; Searching for patterns; Comparing files; Operating on files; Printing files; Rearranging files; Sorting files; Splitting files; Translating characters; AWK utility.

Unit-7: Shell Programming: Programming in the Borne and C-Shell; Wild cards; Simple shell programs; Shell variables; Shell programming constructs; interactive shell scripts; Advanced features.

Unit-8: System Administration: Definition of system administration; Booting the system; Maintaining user accounts; File systems and special files; Backups and restoration; Role and functions of a system manager.
Overview of the linux. operating system

Text Books:

- Systems Programming by Donovan, TMH.
- The unix programming environment by Brain Kernighen & Rob Pike, 1984, PHI & Rob Pike.
- Design of the Unix operating system by Maurich Bach, 1986, PHI.
- Introduction to UNIX and LINUX by John Muster, 2003, TMH.

Reference Book:

- Advanced Unix programmer's Guide by Stephen Prato, BPB
- Unix- Concept and applications by Sumitabha Das, 2002, T.M..H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-305E **Computer Networks**

L	T	P
3	1	-

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

Unit-1: 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

Unit–2: 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.

Unit-3: 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.

Unit–4: 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.

Unit-5: 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 Book:

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

Reference Books:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-301 E **Principles of Operating Systems**

L	T	P
3	1	-

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

Unit-1: Introduction: 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.

Unit–2: 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.

Unit–3: 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.

Unit–4: 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.

Unit–5: Process-Synchronization & Deadlocks: Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, avoidance & detection; deadlock recovery.

Unit-6: I/O Systems: I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Performance Issues.

Unit–7: 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:

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

Reference Books:

- Operating System By Peterson, 1985, AW.
- Operating System By Milankovic, 1990, TMH.
- Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH.
- Operating Systems by Mandrik & Donovan, TMH
- Operating Systems By Deitel, 1990, AWL.
- Operating Systems – Advanced Concepts By Mukesh Singhal, N.G. Shivaratri, 2003, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

EE-309-E MICROPROCESSORS AND INTERFACING

L T P		
3 1 0	CLASS WORK	: 50
	EXAM	: 100
	TOTAL	: 150
	DURATION OF EXAM	: 3 HRS

PART A

UNIT 1. THE 8085 PROCESSOR :
Introduction to microprocessor, 8085 microprocessor: Architecture, instruction set, interrupt structure, and assembly language programming.

UNIT 2. 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.

UNIT 3. 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.

PART B

UNIT 4. INTERFACING DEVICE :
The 8255 PPI chip: Architecture, control words, modes and examples.

UNIT 5. DMA :
Introduction to DMA process, 8237 DMA controller,

UNIT 6. 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.
4. Advanced Microprocessors and Interfacing : Badri Ram; TMH

NOTE: 8 questions are to be set selecting FIVE questions from PART A and THREE questions from PART- B .Students have to attempt any five questions.

CSE -303E Computer Graphics

L	T	P
3	1	-

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

Unit-1: Introduction to Computer Graphics: What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, mid point circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm.

Unit-2: Two/Three Dimensional Viewing: The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck).

Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation.

Three dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

Unit-3: Viewing in 3D: Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.

Unit-4: Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm.

Unit-5: Representing Curves and Surfaces: Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method.

Unit-6: Illumination, shading, image manipulation: Illumination models, shading models for polygons, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images.

Text Books:

- Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addision Wesley.
- Computer Graphics by Donald Hearn and M.Pauline Baker, 2nd Edition, 1999, PHI

Reference Books:

- Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition
- Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999, Addision Wesley.
- Computer Graphics: Secrets and Solutions by Corrign John, BPB
- Graphics, GUI, Games & Multimedia Projects in C by Pilania & Mahendra, Standard Publ.
- Computer Graphics Secrets and solutions by Corrign John, 1994, BPV
- Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-307E **Rapid Application Development Lab.**

L	T	P	Class Work: 25
-	-	2	Exam: 25
			Total: 50
			Duration of Exam: 3 Hrs.

Note: At least 10 experiments are to be performed by the students in the semester

1. Study window's API's? Find out their relationship with MFC classes. Appreciate how they are helpful in finding complexities of window's programming?

2. Get familiar with the essential classes in a typical (document view architecture) VC program and their relationships with each other.

3. Write a program to handle the mouse event right click on client area and display a message box as "Right Button Click".

4. Create a simple model dialog box to read the information about a student i.e. name, roll no. class using appropriate fields.

5. Write a simple console application to create archive class object from file class that reads and stores a simple structure (record).

6. Create a simple database in MS access and connect it to Visual Basic using ADO or DAO.

7. Write a program that reads a text and changes its font, font size as selected by the user from different fonts contained in a list box.

8. With the help of Visual Basic, created an object of excel application and implement any function of it.

9. Write a simple program that displays an appropriate message when an illegal operation is performed, using error handling technique in VB.

10. Make an active X control of your own using Visual Basic.

CSE-308E **Operating Systems Lab.**

L	T	P	Class Work:	25
-	-	2	Exam:	25
			Total:	50
			Duration of Exam:	3 Hrs.

- Study of WINDOWS 2000 Operating System.
- Administration of WINDOWS 2000 (including DNS, LDAP, Directory Services)
- Study of LINUX Operating System (Linux kernel, shell, basic commands pipe & filter commands).
- Administration of LINUX Operating System.
- Writing of Shell Scripts (Shell programming).
- AWK programming.

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

EE-329-E **MICROPROCESSORS AND INTERFACING LAB**

L T P		
0 0 2		
	CLASS WORK	: 25
	EXAM	: 25
	TOTAL	: 50
	DURATION OF EXAM	: 3 HRS

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 and 8255 PPI.

17. Write a program to control the operation of stepper motor using 8085/8086 microprocessor and 8255 PPI.

NOTE: At least ten experiments have to be performed in the semester out of which 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 of EE-309-C.

IT-302_E **Network Programming**

L	T	P
3	1	-

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

Unit-1: Introduction to networking, TC/IP Protocol architecture, Classful internet addresses, subnets, super netting, address resolution Protocol (RAP) and RARP, IP datagram format, UDP and TCP/data grams , ICMP its purpose , FINGER, NET STAT details & IPconfig, Ping, TRACERT, ROUTE.

Unit-2: Socket introduction, elementary TCP sockets, TCP client sever, I/O functions, select& poll functions, socket options elementary UDP sockets, elementary node and address conversions, echo service (TCP and UDP).

Unit-3: Algorithm and issues in server software design : iterative connectionless servers, (UDP), Iterative, connection oriented servers (TCP), single process, concurrent servers multiprotocol servers (TCP, UDP), multi service servers (TCP, UDP).

Unit-4: Remote procedure call concept (RCP) : RPC models, analogy between RPC of client and server, remote programs and procedures, their multiple versions and mutual exclusion communication semantics, RPC retransmits, dynamic port mapping , authentication.

Unit-5: Network file system concept of data link access, debugging techniques , Routing sockets, broadcasting to mobile network.

Text Books:

- Unix Network programming Vol - 2nd edition, W. Richard Stevens
- Internet working with TCP/IP Vol-1, Doubles e-commer.
- Internetworking TCP/IP Vol III Doubles E comer, David L. Stevens

Reference Book:

- Internetworking with TCP/IP, Vol II

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-302 E **Principles of Software Engineering**

L	T	P		
3	1	-	Class Work:	50
			Exam:	100
			Total:	150

Duration of Exam: 3 Hrs.

Unit-1: Introduction: The process, software products, emergence of software engineering, evolving role of software, software life cycle models, Software Characteristics, Applications, Software crisis.

Unit-2 : 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.

Unit-3: 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.

Unit-4: 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 a software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design.

Unit-5: 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.

Unit-6: 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.

Unit-7: Computer Aided software Engineering: CASE, building blocks, integrated case environments and architecture, repository.

Text Book:

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

Reference Books:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-304E Intelligent Systems

L	T	P
3	1	-

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

Unit-1: Foundational issues in intelligent systems: Foundation and history of AI, Ai problems and techniques – AI programming languages, introduction to LISP and PROLOG- problem spaces and searches, blind search strategies, Breadth first- Depth first- heuristic search techniques Hill climbing: best first- A * algorithm AO* algorithm- game tree, Min max algorithms, game playing- alpha beta pruning.

Unit-2: Knowledge representation issues, predicate logic- logic programming, semantic nets-frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems.

Unit-3: Reasoning under uncertainty, review of probability, Baye's probabilistic interferences and Dempster shafer theory, Heuristic methods, symbolic reasoning under uncertainty, Statistical reasoning, Fuzzy reasoning, Temporal reasoning, Non monotonic reasoning.

Unit-4: Planning, planning in situational calculus, representation for planning, partial order planning algorithm, learning from examples, discovery as learning, I earning by analogy, explanation based learning, neural nets, genetic algorithms.

Unit-5: Principles of Natural language processing, rule based systems architecture, Expert systems, knowledge acquisition concepts, AI application to robotics, and current trends in intelligent systems.

Text Book:

- Artificial Intelligence: A Modern Approach,. Russell & Norvig. 1995, Prentice Hall.

Reference Books:

- Artificial Intelligence, Elain Rich and Kevin Knight, 1991, TMH.
- Artificial Intelligence-A modern approach, Staurt Russel and peter norvig, 1998, PHI.
- Artificial intelligence, Patrick Henry Winston:, 1992, Addition Wesley 3rd Ed.,

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE- 307 E **Web Development**

L	T	P
3	1	-

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

Unit-1: Introduction to the Internet, The world wide web: The idea of hypertext and hyper media; How the web works-HTTP, HTML and URLs; How the browser works-MIME types, plugins and helper applications; The standards-HTML, XML, XHTML and the W3C.

Hypertext markup language: The anatomy of an HTML document; Marking up for structure and style: basic page markup, absolute and relative links, ordered and unordered lists, embedding images and controlling appearance, table creation and use, frames, nesting and targeting.
Descriptive markup: Meta tags for common tasks, semantic tags for aiding search, the doubling code and RDF.

Unit-2: Separating style from structure with style sheets: Internal style specifications within HTML, External linked style specification using CSS, page and site design considerations.

Client side programming: Introduction to the JavaScript syntax, the JavaScript object model, Event handling, Output in JavaScript, Forms handling, miscellaneous topics such as cookies, hidden fields, and images; Applications.

Unit-3: Server side programming: Introduction to Server Side Technologies CGI/ASP/JSP., Programming languages for server Side Scripting, Configuring the server to support CGI, applications; Input/output operations on the WWW, Forms processing, (using PERL/VBSCRIPT/JavaSCIPT)

Unit-4: Other dynamic content technologies: introduction to ASP & JSP, Delivering multimedia over web pages, The VRML idea, The Java phenomenon-applets and servelets, issues and web development.

Unit-5: Introduction to Microsoft .NET Technology and its comparison with the competing Technologies.

Text books:

- Beginning XHTML by Frank Boumpery, Cassandra Greer, Dave Raggett, Jenny Raggett, Sebastian Schnitzenbaumer & ted Wugofski, 2000, WROX press (Indian Shroff Publ. SPD) 1st edition
- HTML & XHTML: The Definitive Guide by Chuck Musciano, Bill Kennedy, 2000, 4th Edi.

Reference books:

- XHTML Black Book by Steven Holzner, 2000
- CGI Programming on the World Wide Web. O'Reilly Associates.
- Web Technologies By Achyut S Godbole , Atul Kahate, 2003, T.M.H
- Scott Guelich, Shishir Gundararam, Gunther Birzniek; CGI Programing with Perl 2/e O'Reilly.
- Doug Tidwell, James Snell, Pavel Kulchenko; Programming Web services, O'Reilly.
- Intranets by James D.Cimino, 1997, Jaico Publ.
- Internet and Web Technologies – Raj Kamal, 2002, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

EE-402-E WIRELESS COMMUNICATION

L T P			
3 1 0	CLASS WORK	:	50
	EXAM	:	100
	TOTAL	:	150
	DURATION OF EXAM	:	3 HRS

UNIT 1. 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.

UNIT 2. 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.

UNIT 3. INTRODUCTION TO CELLULAR MOBILE SYSTEMS:

Spectrum Allocation, basic Cellular Systems, performance Criteria, Operation of cellular systems, analog cellular systems, digital Cellular Systems.

UNIT 4. ELLULAR SYSTEM DESIGN FUNDAMENTALS:

Frequency Reuse, channel assignment strategies, handoff Strategies, Interference and system capacity, tracking and grade off service, improving coverage and capacity.

UNIT 5. 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.

UNIT 6. 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.

UNIT 7. 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

NOTE: Eight questions are to be set -one question from each unit. Students have to attempt any five question.

EE-407-E **DIGITAL SIGNAL PROCESSING**

L T P			
3 1 0	CLASS WORK	:	50
	EXAM	:	100
	TOTAL	:	150
	DURATION OF EXAM	:	3 HRS

UNIT 1. 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, energy and power theorems.

UNIT 2. DISCRETE-TIME SYSTEMS: Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite impulse response (IIR) system.

UNIT 3. 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.

UNIT 4. Z-TRANSFORM:
Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Z-transform, applications of Z-transform.

UNIT 5. 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.

UNIT 6. 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

NOTE: Eight questions are to be set - at least one from each unit. Students have to attempt five questions.

IT-304 E **Network Programming Lab.**

L	T	P	Class Work:	25
-	-	2	Exam:	25
			Total:	50
			Duration of Exam:	3 Hrs.

The socket programming can be done on Unix/Linux operating or/and Windows. Socket programming, and the language can be C/VC++ and/or Java

1. Write a program to Create Sockets For Sending And Receiving Data.
2. Write a program to Obtain The Local & Remote Socket Address.
3. Write a program to Create Sockets For Handling Multiple Connection
4. Write a program to Obtain The Information About The (A) Host (B) Network (C) Protocols (D) Domains
5. Write a program to Manipulate The IP Address.
6. Write a program to Write A Telnet Client.
7. Write a program to Make An FTP Client

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

CSE-306E Intelligent System Lab.

L	T	P	Class Work:	25
-	-	2	Exam:	25
			Total:	50
			Duration of Exam:	3 Hrs.

1. Study of PROLOG.
   Write the following programs using PROLOG.
2. Write a program to solve 8 queens problem.
3. Solve any problem using depth first search.
4. Solve any problem using best first search.
5. Solve 8-puzzle problem using best first search
6. Solve Robot (traversal) problem using means End Analysis.
7. Solve traveling salesman problem.

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

CSE-311 E Web Development & Core JAVA Lab.

L	T	P
-	-	2

Class Work: 25
Exam: 25
Total: 50
Duration of Exam: 3 Hrs.

Java programs using classes & objects and various control constructs such as loops etc , and data structures such as arrays , structures and functions.
Java programs for creating Applets for display of Images ,Texts and Animation
Programs related to interfaces & packages
Input output & Random files programs in java
Java programs using Event driven concept
Programs related to Network Programming

Development of Web site for the college or newspaper agency.

Books recommended for Lab.

- Java Elements – Principles of Programming in Java , Duane A. Bailey , Duane W. Bailey, 2000, T.M.H
- The Java Handbook by Patrick Naughton, TMH, N.Delhi

IT-401 E **Data Warehousing And Data Mining**

L	T	P
3	1	-

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

Unit-1: 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.

Unit-2: 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.

Unit-3: 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.

Unit-4: Data mining definition & task, KDD versus data mining, data mining techniques, tools and applications.

Unit-5: Data mining query languages, data specification, specifying knowledge, hierarchy specification, pattern presentation & visualisation specification, data mining languages and standardisation of data mining.

Unit-6: Data mining techniques: Association rules, Clustering techniques, Decision tree knowledge discovery through Neural Networks & Genetic Algorithm, Rough Sets, Support Victor Machines and Fuzzy techniques.

Unit-7: 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. .

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-403 E Software Project Management

L	T	P
3	1	-

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

Unit-1: 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.

Unit-2: 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.

Unit-3: 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.

Unit-4: 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..

Unit-5: 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.

Unit-6: 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, 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..

Unit-7: 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.

Unit-8: Study of Any Software Project Management software: viz Project 2000 or equivalent

Text Book:

- Software Project Management (2nd Edition), by Bob Hughes and Mike Cotterell, 1999, TMH

Reference Books:

- Software Engineering – A Practitioner's approach, Roger S. Pressman (5th edi), 2001, MGH
- Software Project Management, Walker Royce, 1998, Addison Wesley.

- Project Management 2/c. Maylor
- Managing Global software Projects, Ramesh, 2001, TMH.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT- 403E Systems & Network Administration

L	T	P
3	1	-

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

UNIT-1 : Introduction to Systems and Network Administration: The Scope of Systems and Network Administration, The Goals of Systems and Network Administration, System Components and their Management: Operating Systems: Windows and Unix Variants, File Systems and Standards (UFS, NFS, NTFS), Processes and Job Control, Privileged, User and Group Accounts, Logs and Audits, Systems Performance Tuning:

Host Management: Booting and Shutting down of an Operating System, Formatting, Partitioning and Building a File System, File System Layout, Concept of swap space, Cloning Systems, OS Installation, Installation and configuration of devices and drivers, Software Installation and Structuring Software, Open Source Software: The GNU Project, Superuser/Administrator Privileges, User Management, Adding/Removing users, Controlling User Resources, Disk Space Allocation and quotas, Process Management and Monitoring, Scheduling Processes, Killing/Stopping processes, Restarting a Process, Monitoring Process Activity, Maintaining Log Files, File System Repair, Backup and Restoration, , Handling Man Pages/Help System, Kernel Customization, Integrating Multiple Operating Systems, System Sharing, User IDs, Passwords and Authentication.

UNIT-2 : Network Administration: Introduction to Network Administration Approaches, Addressing and Subnetting : Fixed Vs Variable Masks, VLAN Principles and Configuration, Routing Concepts, Static and Dynamic Routing, Routing Protocols: RIP, OSPF, BGP, Network Address Translation (NAT), Configuring a Linux/Windows Box as a Router, Dial-up configuration and Authentication: PPP, Radius, RAS, Configuring a DNS Server, Configuring Sendmail Service, Configuring a Web Server, Configuring a Proxy Server, TCP/IP Troubleshooting: ping, traceroute, ifconfig, netstat, ipconfig, Network Management.

UNIT-3 : Host and Network Security :Security Planning, Categories of Security: C1, C2, C3, C4, Password Security, Access Control and Monitoring: Wrappers, Firewalls: Filtering Rules, Detection and Prevention of Denial of Service (DOS) Attacks, Automatic Identification of Configuration Loop Holes, Security Information Resources: CERT, Installing and Upgrading System Software, Use of Scripting tools: Shell Scripting, Perl/Python Scripting, Use of Make Option

UNIT-4 : Security Planning, Categories of Security: C1, C2, C3, C4, password security, Access Control and Monitoring.

BOOKS RECOMMENDED

- "Principles of Network and System Administration", Mark Burgess, 2000, John Wiley and Sons Ltd,
- "TCP/IP Network Administration" (3rd Edition), Craig Hunt, O'Reilly and Associates Inc., 2002.
- "Windows 2000 Administration", George Splading, 2000, McGraw-Hill.
- "Linux Network Administrator's Guide", Olaf Kirch and Terry Dawson, (2nd Edition), O'Reilly and Associates Inc., 2000, (Shroff Publishers and Distributors, Culcutta),

Software Requirements : Microsoft Windows 2000, Linux, Perl/Python

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT 405 System and Network Administration Lab.

L	T	P
-	-	3

Class Work: 50
Exam: 50
Total: 100
Duration of exam: 3 hrs.

- Management of the users & the domain.
- Configuring DHCP.
- Setting up the local security policy.
- Start and stop services from user window and command prompt.
- Use of event viewer.
- Use of the performance monitor.
- Management of the IIS and FJP server.
- Setting up of local area network.
- Setting up of router in Window 2000 server.
- Use of utilities (a) Ping (b) Trocert (c) netstat (d) net (e) IP configuration (f) Path ping
    - Use of network monitor.
    - Setting up of a DNS.
    - Setting up and use “Terminal Clinet Services”.

IT 407 **Advanced JAVA Lab.**

L	T	P
-	-	3

Class Work: 50
Exam: 50
Total: 100
Duration of exam: 3 hrs.

Development of programs relating to :

- **JDBC**
- **Servlets**
- **Beans**
- **RMI**
- **JSP**

Semester-8

CSE-402E Distributed Operating System

L	T	P
3	1	-

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

Unit-1: Introduction: 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.

Unit-2: 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 .

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.

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

Unit-5: Case study MACH: Introduction to MACH, process management in MACH, communication in MACH, UNIX emulation in MACH.

Text Book:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT – 402 E **Security of Information Systems**

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

Unit-1: Basic Encryption and Decryption: Terminology and Background: Encryption, Decryption and Cryptosystems, Plain Text and Cipher Text, Encryption Algorithms, Cryptanalysis.
Introduction to Ciphers: Monoalphabetic Substitutions such as the Caesar Cipher, Cryptanalysis of Monoalphabetic Ciphers, Polyalphabetic Ciphers such as Vigenere Tableaux, Cryptanalysis of Polyalphabetic Ciphers, Perfect Substitution Cipher such as the Vernam Cipher, Stream and Block Ciphers, Characteristics of 'Good' Ciphers: Shannon Characteristics, Confusion and Diffusion, Information Theoretic Tests, Unicity Distance,
Unit-2: Secure Encryption Systems: Hard' Problems: Complexity: NP-Complete Problems, Characteristics of NP-Complete Problems, The Meaning of NP-Completeness, NP-Completeness and Cryptography.
Properties of Arithmetic Operations: Inverses, Primes, Greatest Common Divisor, Euclidean Algorithm, Modular Arithmetic, Properties of Modular Arithmetic, Computing the inverse, Fermat's Theorem, Algorithm for Computing Inverses, Random number generation
Public Key (Asymmetric key) Encryption Systems: Concept and Characteristics of Public key Encryption System, Introduction to Merkle-Hellman Knapsacks , Rivest-Shamir-Adelman (RSA) Encryption in Detail, Introduction to Digital Signature Algorithms , The Digital Signature Standard (DSA).
Hash Algorithms: Hash Concept , Description of Hash Algorithms , Message Digest Algorithms such as MD4 and MD5 , Secure Hash Algorithms such as SHA1 and SHA2.
Secure Secret Key (Symmetric) Systems: The Data Encryption Standard (DES),Analyzing and Strengthening of DES, Key Escrow and Clipper, Introduction to Advance Encryption Standard (AES)
Unit–3: Applied Cryptography, Protocols and Practice: Key Management Protocols:Solving Key Distribution Problem, Diffie-Hellman Algorithm, Key Exchange with Public Key Cryptography.
Public Key Infrastructure (PKI): Concept of Digital Certificate, Certificate Authorities and it's roles, X509 Structure of Digital Certificate, Types of Public Key Infrastructures.
Legal Issues: Copyrights, Patents, Trade Secrets, Computer Crime, Cryptography and the Law.
Unit–4: Operating System, Database and Program Security: Operating Systems Security:Security Policies, Models of Security, Security Features of Ordinary Operating System, Security Features of Trusted Operating System.
Database Security: Security Requirements of Databases, Reliability and Integrity, Protection of Sensitive Data, Inference Problem: Direct and Indirect Attacks
Program Security: Kinds of Malicious Code, How Viruses Attach and Gain Control, Homes for Viruses, Virus Signatures, Preventing Virus Infection, Trapdoors, Convert Channels, Control Against Program Threats, Java mobile codes.
Unit-5: Network Security: Network Security Issues such as Impersonation, Message Confidentiality, Message Integrity, Code Integrity, Denial of Service, Secure Communication Mechanisms such as IPSec, PKI based Authentication and Kerberos Authentication, Biometrics Authentication Mechanisms, Access Control Mechanisms, Firewalls
Web Security: Solving Privacy Problems, Solving Authentication Problems, Secure Socket Layer (SSL) Protocol, Secure Electronic Transaction (SET) Protocol , Safe Guarding Web Servers.
Secure Electronic Mail: Privacy Enhanced Email (PEM), Pretty Good Privacy (PGP), Public Key Cryptography Standards-PKCS#7, Secure/Multipurpose Internet Mail Extensions (S/MIME)

Text Books:

- "Security in Computing (Second Edition)", Charles P. Pfleeger, 1996, Prentic-Hall International, Inc.,
- "Applied Cryptography Protocols, Algorithms, and Source Code in C (Second edition)", Bruce Schneier, 1995, John

Reference Books:

- "Security Technologies for the World Wide Web", Rolf Oppliger, Artech House, Inc.
- "Digital Certificates Applied Internet Security", Jalal Feghhi, Jalli Feghhi and Peter Williams, Addison Wesley Longman,
- "The World Wide Web Security FAQ", Lincoln D. Stein, World Wide Web Consortium, [Online] Available at http://www.w3.org/Security/Faq/www-security-faq.html
- Cryptographic Message Syntax Standard, Public-Key Cryptography Standards, RSA Laboratories, [Online] Available at http://www.rsasecurity.com/rsalabs/pkcs/pkcs-7/index.html

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT 404 E **Computer Animation Lab.**

L	T	P	Class Work: 50
-	-	3	Exam: 50
			Total: 100
			Duration of Exam: 3 Hrs.

1. Exercises involving advertisement on the Web.
2. Animation of a video game.
3. Animation of a traffic light signal controlling car movements.
4. Animation of a bird flying over a mountain.
5. Animation of landing of plane.
6. Animation of morphing from face to truck.
7. Animation of face from frown to smile.
8. Animation of plucking a flower from plant.
9. Animation of movement of jumping ball in a uniform speed.
10. Animation of a person sitting on a car seat and tying belt.

ELECTIVES-I

CSE-417E **Data Network Design**

L	T	P
4	-	-

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

Unit-1: Review of OSI layers, circuit types & services, topologies, networking hardware, common protocols & interfaces in physical, data, network & transport layers.

Unit-2: Switching technologies, multiplexing, circuit switching, packet switching X.25, frame relax, SMDs ATM, B-ISDN, traffic matrix, traffic pattern calculations, performance issues of packet networks, delay, availability and reliability

Unit-3: Comparisons: circuits Vs. packets vs frame vs cell Technologies & services, protocols & interface comparisons, switching comparisons, SMDs Vs. B-ISDN, FDDE Vs SMDS

Unit-4: Network Design for Access: Campus network design, leased line and radio modems, DDR & ISDN Access Network design, X.25 remote access network design, Frame-relay interfaces & traffic shaping VSAT & Wlan network design. Scaling access networks OS: protocols, performance analysis.

Unit-5: Network Design for Backbone: Identification & selection of internetworking devices, CISCO routers & Nortel switches, EIGRP,Network Design for convergence: UDP broadcasts, IP Networks for Voice, Data, Video, Fax, Soft & hard design examples for IP Technology networks, network design for digital video broadcast

Unit-6: Data Network Management Systems: Managing IP, ICMP, TCP, UDP, X.25 reporting Ethernet traffic, managing bridges & routers. Microsoft & HP, NMS Tools, Case Studies: selected from design, architecture & topology areas of internetworks. Introduction to storage area networks and network attached storage.

Text Book:

- Data Network Design; D L Spolin, 1993, Mc-Graw Hill.

Reference Books:

- SNMP "Feit" 1995, Mc-Graw Hill Inc.
- Network Design & Case Studies "CISCO Systems Inc." , CISCO Press, 1993
- Designing Data Networks by PHI, 1981

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-419E **Neural Networks**

L	T	P
4	-	-

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

Unit-1: Overview of biological neurons: Structure of biological neurons relevant to ANNs.

Unit-2: 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.

Unit-3: Single layer Perception Classifier: Classification model, Features & Decision regions; training & classification using discrete perceptron, algorithm, single layer continuous perceptron networks for linearlyseperable classifications.

Unit-4: 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.

Unit-5: Single layer feed back Networks: Basic Concepts, Hopfield networks, Training & Examples.

Unit-6: Associative memories: Linear Association, Basic Concepts of recurrent Auto associative memory: rentrieval algorithm, storage algorithm; By directional associative memory, Architecture, Association encoding & decoding, Stability.

Unit-7: Self organizing networks: UN supervised learning of clusters, winner-take-all learning, recall mode, Initialisation of weights, seperability limitations

Text Books:

- Introduction to artificial Neural systems by Jacek M. Zurada, 1994, Jaico Publ. House.

Reference Books:

- "Neural Networks :A Comprehensive formulation", Simon Haykin, 1998, AW
- "Neural Networks", Kosko, 1992, PHI.
- "Neural Network Fundamentals" – N.K. Bose , P. Liang, 2002, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-465 E **Network Technology**

L	T	P
4	-	-

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

Unit-1: Overview of Internet: Address and domain Management, SNMP, Transport Layer issues,
TCP/IP, FTP, WWW undergoing technology, E mail talent, FTP, Gateway, Dial-up, SLIP/PPP Dedicated lines, Internet searching tools, gopher, Archie, Veronica, WWW, Lynx, Mosaic, WAIS,
Usenet.

Unit-2: Security issues, CGI, PERL, HTML, VRML, JAVA, VB script and other internet development tools, internet networking TCP/IP protocols .) Network Security and Management.

Unit-3: Application Layer Services and protocols (RPC, NFC, SMTP, FTP, TELENET), Review of LAN, Principles of IBASE5 (Strain), Transmitter and receiver of IBASE5 (Starian), Node, LAN Manager, Software of IBASE5 Node, 10BASE5 Ethernet and 10BASE2 (Cheaper net), Twisted pair Ethernet, Serial Communication, Connecting LANs and WANS.

Unit-4: Serial Communication Circuits, Modems, USART-Processor Interface Data Buffer Block of 8251A, Control logic of USART, PROTOCOLS, Transmitter, Receiver, Synchronous Modems and Asynchronous Modems. SYNDET/BRKDET ion 8251A, Monitoring of 8251A, writing characters to be transmitted to 8251A, Monitoring of 8251A. Read status, ISDN: Technology, devices, Architecture Protocols, Flow Control Error detection and Correction, ATM, Technology, Inter Networking SDH/SONET.

Text Book:

- Computer Networks by Tanenbaum, 2003, PHI.
- Computer Networks by Black, 1995, PHI.

Reference Books:

- Data communication & Networking by Furouzan, 2000, TMH.
- Data and Network communications by Miller (Delmer)
- Communication Networks: Fundamentals Concepts & Key Architectures by Alberto Leon, TMH

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

EE-310-E **DIGITAL SYSTEM DESIGN**

L T P			
3 1 0	CLASS WORK	:	50
	EXAM	:	100
	TOTAL	:	150
	DURATION OF EXAM	:	3 HRS

UNIT 1. INTRODUCTION :
Introduction to Computer-aided design tools for digital systems. Hardware description languages; introduction to VHDL, data objects, classes and data types, Operators, Overloading, logical operators.Types of delays Entity and Architecture declaration. Introduction to behavioural, dataflow and structural models.

UNIT 2. VHDL STATEMENTS :
Assignment statements, sequential statements and process, conditional statements, case statement Array and loops, resolution functions, Packages and Libraries, concurrent statements. Subprograms: Application of Functions and Procedures, Structural Modelling, component declaration, structural layout and generics.

UNIT 3. COMBINATIONAL CIRCUIT DESIGN:
VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders, code converters, comparators, implementation of Boolean functions etc.

UNIT 4. SEQUENTIAL CIRCUITS DESIGN :
VHDL Models and Simulation of Sequential Circuits
Shift Registers, Counters etc.

UNIT 5. DESIGN OF MICROCOMPUTER :
Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of a simple microcomputer system using VHDL

UNIT 6. DESIGN WITH CPLDs AND FPGAs :
Progr ammable logic devices : ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs

REFERENCE BOOKS:
1. IEEE Standard VHDL Language Reference Manual (1993).
2. Digital Design and Modelling with VHDL and Synthesis : KC Chang; IEEE Computer Society Press.
3. "A VHDL Primmer" : Bhasker; Prentice Hall 1995.
4. "Digital System Design using VHDL" : Charles. H.Roth ; PWS (1998).
5. "VHDL-Analysis & Modelling of Digital Systems" : Navabi Z; McGraw Hill.
6. VHDL-IV Edition :Perry; TMH (2002)
7. "Introduction to Digital Systems" : Ercegovac. Lang & Moreno; John Wiley (1999).
8. Fundamentals of Digital Logic with VHDL Design : Brown and Vranesic; TMH (2000)
9. Modern Digital Electronics- III Edition: R.P Jain; TMH (2003).

NOTE : Eight questions are to be set - at least one question from each unit. Students will be required to attempt five questions in all.

CSE-421 E **Advanced Database Management Systems**

L	T	P
4	-	-

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

Unit-1: Data Models: EER model and relationship to the OO model, Object Oriented data model and ODMG standard, Other data models - NIAM, GOOD, ORM.

Query Optimisation: Query Execution Algorithms, Heuristics in Query Execution, Cost Estimation in Query Execution, Semantic Query Optimisation.

Database Transactions and Recovery Procedures: Transaction Processing Concepts, Transaction and System Concepts, Desirable Properties of a Transaction, Schedules and Recoverability, Serializability of Schedules, Transaction Support in SQL, Recovery Techniques, Database Backup, Concurrency control, Locking techniques for Concurrency Control, Concurrency Control Techniques, Granularity of Data Items.

Unit-2: Client Server Computing: Client Server Concepts, 2-Tier and 3-Tier Client Server Systems, Client/Server Architecture and the Internet, Client /Database Server Models, Technology Components of Client Server Systems, Application Development in Client Server Systems.

Distributed Databases: Reliability and Commit protocols, Fragmentation and Distribution, View Integration, Distributed database design, Distributed algorithms for data management, Heterogeneous and Federated Database Systems.

Unit-3: Deductive Databases: Recursive Queries, Prolog/Datalog Notation, Basic inference Mechanism for Logic Programs, Deductive Database Systems, Deductive Object Oriented Database Systems.
Commercial and Research Prototypes: Parallel database, Multimedia database, Mobile database,
Digital libraries, Temporal database.

Text Book:

- Fundamentals of Database Systems (3 edition), Elmasri R. and Navathe S.B., 2000, Addison Wesley, Low Priced Edition.

Reference Book:

- Database System Concepts by A. Silbershatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition.

Note: Eight questions will be set in all by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all.

CSE-423E **Object Oriented Software Engineering**

L	T	P
4	-	-

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

Unit-1: Review of object oriented systems: Design objects, class hierarchy, inheritance, polymorphism, object relationships and associations, aggregations and object containment, object persistence, meta classes, object oriented systems development life cycle, Software development process object oriented systems development: a use case driven approach.

Unit-2: Methodology for object oriented design: Object modeling technique as software engineering methodology, Rumbaugh methodology, Jacobson Methodology, Booch Methodology, Patterns, Frameworks, the unified approach, unified modeling language (UML).

Unit-3: Object Oriented Analysis: Analysis process, use case driven object oriented analysis, use-case model, object classification, theory, different approaches for identifying classes, classes, responsibilities and collaborators, identifying object relationships, attributes and methods, super sub class relationships, A- part of relationships aggregation, class responsibilities, object responsibilities.

Unit-4: Object oriented design process, corollaries, design axioms, design patterns, object oriented design philosophy, UML object constraint language, designing classes: The process, class visibility, refining attributes, designing methods ad protocols, packages and managing classes, designing interface objects, view layer interface design, Macro and Micro level interface design process

Text Book:

- Object Oriented software Engineering, Ivar Jacobson, 1995, Addison Wesley.

Reference Books:

- Object Oriented systems development, Ali Bahrami, 1999, MGH.
- Object Oriented Modeling and Design, Rumbaugh et.al.,1997, PHI.
- Object Oriented analysis and Design, Grady Booch, 1995, Addison Wesley
- Object Oriented Software Engineering by Subhash Mehta, Suresh K. Basandra, Galgotia Publ.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

HUM-451-E LANGUAGE SKILLS FOR ENGINEERS

SEMESTER VII (ELECTIVE)

L	T	P		
4	-	-	Class Work	: 50 Marks
			Exam	: 80 Marks
			Practical/Presentation	: 20
			Total	: 150 Marks
			Duration of Exam	: 3 Hrs

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.

COURSE CONTENT:

UNIT I

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.

UNIT II

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

UNIT III

Punctuation and Mechanics: End Punctuation; Internal Punctuation; Word Punctuation.

UNIT IV

Comprehension: Abstracting; Summarising; Observations, Findings and Conclusions; Illustration and Inductive Logic; Deduction and Analogy.

UNIT V

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

SUGGESTED READING:

1. *Working with Words* by R.Gairns and S.Redman, Cambridge University Press, London.
2. *Meanings into Words – Upper Intermediate Students Book,* Doff/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 Idiom* by W.J. Ball, Longman.

6. *A guide to Correct English* by L.A. Hill, 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.

SCHEME OF EXAMINATION:

(A) THEORETICAL:

The pattern of the exam would be more or less like the pattern of the competitive exams. (i.e., OBJECTIVE TYPE) like CAT G-MAT etc., as far as the units I, II, III and IV are concerned.

Unit-I, II, III: (30,20,10 Marks respectively)

The first section of the question paper will have 110 objective type questions with no choice at all. These 110(60+40+10) questions will cover all the first three units (I, II, III) of the syllabus and would carry 30,20 and 10 marks respectively. The questions may be in the form of multiple choices, fill-in-the-blank, supply the right word/choice, choose the right alternative, do as directed etc.

Unit-IV: 20 Marks

The question from this unit will test comprehension competence (in the form of various elements mentioned in the unit) of the text given.

(B) PRACTICAL (Presentation):

There will be an oral test carrying **20 marks**. The presentation part of the section i.e. Unit-V will be covered in this test. Hence, there is no need to include this unit in theory exam.

Three hours for a group of 15 students are required for this test. Test can be in the form of any of the activities mentioned in the Unit-V.

A panel of examiners appointed by the University will evaluate the presentation.

MATH-451-E COMBINATORICS AND GRAPH THEORY
(ELECTIVE FOR CSE, IT)

L	T	P			
4	-	-	Class Work	:	50 Marks
			Exam.	:	100 Marks
			Total	:	150 Marks
			Duration of exam.	:	3 Hours

Unit-I :
Permutations and combinations, Recurrence relations,
Generating functions, decision trees.

Unit-II :
Graphs, incidence and degree, isomorphism, subgraphs, walks,
paths and circuits, connected graphs, Disconnected graphs and
component Euler's graph, operations on graphs, Hamiltonian paths
and circuits, Travelling salesman problem.

Unit-III :
Trees, properties of trees, Pendant vertices in tree, Rooted
and binary trees, Spanning trees, Fundamental circuits, Spanning
trees in a weighted graph.

Unit-IV :
Cut-sets, properties of cut-sets, Fundamental circuits and
cut-sets, connectivity and separability, Network flows, 1-
isomorphism and 2-isomerphism.

Unit-V :
Planer graphs, Kuratowski's two graphs, different
representation of a planer graph, Detection of planarity, vector
space of graph.

Unit-VI :
Matrix representation of graphs, incidence matrix, submatrix
of incidence matrix, Fundamental circuit matrix, cut-set matrix
and relationship between all three above.

Unit-VII :
Colouring, chromatic number, chromatic polynomials, four
color problem, Five color theorem.

Unit-VIII :
Directed graphs and their types, Binary relation, Directed
paths and connectedness, Euler's digraph.

Books Recommended :

1. Graph Theory by Narsingh Deo, P.H.I.

2. Graph Theory by Harry P., Addison-Wesley.

Note : Examiner will set eight questions, taking one from each unit. Students will be required to attempt any five questions.

HUM-455-E **ENTREPRENEURSHIP**

VIITH SEMESTER (ELECTIVE)

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

UNIT-I : Promotion of Entrepreneurship

Meaning, definition and functions of an entrepreneur, qualities of a good entrepreneur; Role of Entrepreneur in economic development; Government measures for the promotion of small scale industries with special reference to Haryana; Cultural factors in developing entrepreneurship.

UNIT-II : Ownership and Location of Industrial Units

Different forms of Industrial Organisation.

Theories of Industrial location. Process of preparing project reports.

UNIT-III : Size of Firm and Pricing

Concept of optimum firm, factors determining

Optimum size. Technical, Managerial, Marketing Uncertainties and risk.

Pricing Methods, Policies and procedures.

UNIT-IV : Financing of Small Industries

Importance and need : Commercial Banks and term lending in India; Banks and under-writing of capital issues; Brief description about the role of other financial agencies viz; Industrial Finance Corporation of India. State Financial Corporation, Industrial Development Bank of India; Unit Trust of India.

UNIT-V : Problems Faced by Small Enterprises

Problems connected with Marketing, Management of New Products; Power; Finance; Raw Material; Under-utilization of capacity; Causes of under – utilization; Rehabilitation of Sick Mills.

UNIT-VI : Government and Business

(a) Highlights of Industrial Policy and Licensing Policy.

(b) International Marketing with special reference to export documentation.

Recommended Books :

1. Entrepreneurship of Small Scale Industries – Deshpande Manohar D. (Asian Publishers, New Delhi)
2. Environment and Entrepreneur – Tandon B.C. (Asian Publishers, New Delhi).
3. The Industrial Economy of India – Kuchhal S.C. (Chaitanya, Allahabad).
4. Emerging Trends in Entrepreneurship Development Theories & Practices – Singh P.Narendra (International Founder, New Delhi)
5. Entrepreneur, Banker & Small Scale Industries – Bhattacharya Hrisnikes.
6. Entrepreneurship & Growth of Enterprise in Industrial Estates – Rao Gangadhara N.

NOTE: Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

ELECTIVES-2

CSE-401 E **Advanced Computer Architecture**

L	T	P
3	1	-

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

Unit–1: 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.

Unit–2: 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

Unit-3: 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 Tcycle in V-R Translation, studies. Design summary.

Unit–4: 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.

Unit–5: 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 Book:

- Advance computer architecture by Hwang & Briggs, 1993, TMH.

Reference Books:

- Pipelined and Parallel processor design by Michael J. Fiynn – 1995, Narosa.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-467E **Computer Software Testing**

L	T	P
4	-	-

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

Unit-1: Fundamentals and Testing types: First, second and later cycles of testing. Objectives and limits of testing. Overview of S/W development stages, Planning and Design stages and testing during these stages. Glass box code, Regression and Black box testing, Software errors, Categories of software error.

Unit-2: Reporting and analyzing bugs: Problem reports, Content and Characteristics of Problem Report, analysis and Tactics for analyzing a reproducible bug. Making a bug reproducible

Unit-3: Problem Tracking System: Objective of Problem Tracking System, tasks of the system, Problem tracking overview, users of the tracking system, mechanics of the database

Unit-4: Test Case Design: Characteristics of a good test, equivalence classes and boundary values, visible state transitions, Race conditions and other time dependencies, load testing. Error guessing, Function equivalence testing, Regression Testing, General issues in configuration testing, printer testing

Unit-5: Localization and User Manuals testing: Translated text expands, Character sets, Keyboards, Text filters, Loading, saving, importing, and exporting high and low ASCII, Operating system Language, Hot keys, Error message identifiers, Hyphenation rules, Spelling rules, Sorting Rules, Uppercase and Lowercase conversion, Printers, Sizes of paper, CPU's and video, Rodents, Data formats and setup options, Rulers and measurements, Culture-bound Graphics and output, European product compatibility, Memory availability, automated testing, Testing User Manuals, Effective documentation, documentation tester's objective, How testing documentation contributes to software reliability

Unit-6: Testing Tools and Test Planning: Fundamental tools, Automated acceptance and regression tests, standards, Translucent box testing Overall objective of the test plan: product or tool? Detailed objective , type of test, strategy for developing components of test planning documents, components of test planning documents, documenting test materials

Unit-7: S/W Development tradeoffs and models, Quality-related costs, The development time line, Product design, alpha, Pre-beta, Beta, User Interface freeze, Pre-final, Final integrity testing, Project post-mortems, Legal consequences of defective software, Managing and role of a testing group, independent test agencies

Text Book:

- Testing Computer Software, by Cem Kaner, Jack Falk,Hung Quoc Nguyen, 1999, Pub: Wiley, (Second Edition).

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-469E **Introduction to E-commerce & ERP**

L	T	P
4	-	-

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

Part-A

Unit-1: Introduction and Concepts: Networks and commercial transactions – Internet and other novelties; networks and electronic transactions today, Model for commercial transactions; Internet environment – internet advantage, worlds wide web and other internet sales venues; Online commerce solutions.

Unit-2: Electronic Payment Methods: Updating traditional transactions; Secure online transaction models; Online commercial environments; digital currencies and payment systems; Offline secure processing; private data networks. Security protocols.

Unit-3: Electronic Commerce Providers: On-line Commerce options: Company profiles. Electronic Payment Systems: Digital payment systems; First virtual internet payment system; cyber cash model. On-line Commerce Environments: Servers and commercial environments; Ecommerce servers.

Unit-4: Digital Currencies: Operational process of Digicash, Ecash Trail; Using Ecash; Smart cards; Electronic Data Interchange: basics, EDI versus Internet and EDI over Internet. Strategies, Techniques and Tools, Shopping techniques and online selling techniques.

Part- B

Unit-5: ERP- An Enterprise Perspective: Production Finance, Personnel disciplines and their relationship, Transiting environment, MIS Integration for disciplines, Information/Workflow, Network Structure, Client Server Integrator System, Virtual Enterprise.

Unit-6: ERP – Resource Management Perspective: Functional and Process of Resource. Management, Introduction to basic Modules of ERP System: HRD, Personnel Management, Training and Development, Skill Inventory, Material Planning and Control, Inventory, Forecasting, Manufacturing, Production Planning, Production Scheduling, Production Control, Sales and Distribution, Finance, Resource Management in global scenario.

Unit-7: ERP - Information System perspective: Introduction to OLAP (Online Analysis and Processing), TP, OAS, KBS, MRP, BPR,. SCM, REP, CRM, Information Communication Technology.

Unit-8: ERP-Key Managerial issues: Concept Selling, IT Infrastructure, Implication, of ERP Systems on Business Organization, Critical success factors in ERP System, ERP Culture Implementation Issues, Resistance to change, ERP Selection issues, Return on Investment, Pre and Post Implementation Issues.

Text Book:

- "Frontiers of electronics Commerce" Ravi lalakota, Andrew Whinston ,1996, Addision Wesley,
- Enterprise Resource Planning-Concepts and Practice, V.K. Garg and N.K. Venkita Krishna, 1998, PHI.

Reference Books:

- The SAP/3 Handbook, John Antonio, Fernandz, TMH.
- "The E-Business Revolution" Denial amor Addision Wesley
- "From Edi to E-Commerce: A Business Initiative" Sokol TMH
- "E Commerce" Greenstein and Feinman TMH
- "E Commerce" Excel, Diwan, Sharma
- Asset International "Net Commerce" TMH
- "E Commerce: The Cutting Edge of Business" Bajan And Nag TMH
- E-Commerces- Jaffrey F. Rayport , Bernard J. Jaworski, 2002, T.M.H
- Electronic Commerce – Security , Risk management and Control , Greenstein, Feinman, 2002, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all but at least two from each Part A & Part B.

CSE-425E **Natural Language Processing**

L	T	P
4	-	-

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

Unit-1: Components of natural language processing: lexicography, syntax, semantics, pragmatics:
word level representation of natural languages prosoty & natural languages.

Unit-2: Formal languages and grammars: chomsky hierarchy, Left-Associative grammars, ambiguous grammars, resolution of ambiguities.

Unit-3: Computation linguistics: recognition and parsing of natural language structures: ATN & RTN,General techniques of parsing: CKY, Earley & Tomitas algorithm.

Unit-4: Semantics-knowledge representation semantic networks logic and inference pragmatics, graph models and optimization, prolog for natural language semantic.

Unit-5: 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:

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

Reference Books:

- "Language as a cognitive process", Terry Winograd 1983, AW
- "Natural Language processing in prolog" G. Gazder, 1989, Addison Wesley.
- " Introduction of Formal Language Theory, Mdlj Arbib & Kfaury, 1988, Springer Verlog

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-471 E **Management Information System**

L	T	P
4	-	-

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

Unit-1: 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.

Unit-2: Information Technology: A manager's overview, managerial overviews, computer hardware & software, , DBMS, RDBMS and Telecommunication.

Unit-3: Conceptual system design: Define the problems, set systems objective, 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.

Unit-4: 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, inform and involve the organization again, 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.

Unit-5: 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 .

Unit-6: Advanced Concepts in Information Systems: Enterprise Resources Management(ERP), Supply Chain Management, C R M , 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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-405E **Compiler Design**

L	T	P
3	1	-

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

Unit–1: Introduction To Compilers: Compilers and translators, need of translators, structure of compiler :its different phases, Compiler construction tools.

Unit–2 Lexical Analysis: Role of lexical analyzer, design of lexical analyzer, regular expressions , Specification and recognition of tokens, input buffering, A language specifying lexical analyzer. Finite automata, conversion from regular expression to finite automata, and vice versa, minimizing number of states of DFA, Implementation of lexical analyzer.

Unit–3 Syntax Analysis: Role of parsers, context free grammars, definition of parsing.

Unit–4 Parsing Technique: Shift- reduce parsing, operator precedence parsing, top down par sing, predictive parsing.

Unit–5: LR parsers, SLR, LALR and Canonical LR parser.

Unit–6 Syntax Directed Translations: Syntax directed definition, construction of syntax trees, syntax directed translation scheme, implementation of syntax directed translation, three address code, quadruples and triples.

Unit–7: Symbol Table & Error Detection And Recovery: Symbol tables, its contents and data structure for symbol tables; trees, arrays, linked lists, hash tables. Errors, lexical phase error, syntactic phase error, semantic error.

Unit–8 Code Optimization & Code Generation: Code generation, forms of objects code, machine dependent code, optimization, register allocation for temporary and user defined variables.

Text Books:

- Compilers Principle, Techniques & Tools - Alfread V. AHO, Ravi Sethi & J.D. Ullman; - 1998Addison Wesley.
- Compiler Design by O.G. Kakde, 1995, Laxmi Publ.

Reference Books:

- Theory and practice of compiler writing, Tremblay & Sorenson, 1985, Mc. Graw Hill.
- System software by Dhamdae, 1986, MGH.
- Principles of compiler Design, Narosa Publication

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

HUM-453-E **ORAL COMMUNICATION COMPETENCE**
SEMESTER VII (ELECTIVE)

L	T	P		
4	-	-	Class Work	: 50 Marks
			Theory	: 60 Marks
			Practical/Presentation	: 40 Marks
			Total	: 150 Marks
			Duration of Exam:	2 Hrs

Oral communication forms the major chunk of social and professional interaction. It is not only the 'what' but the 'how' of knowledge communication that assumes utmost importance once the professional students enter the job market. S/he has to be well-versed with the nuances and complexities, not only of every day oral interaction but also with the situation based oral competence. This course is designed with this need of the professional students in mind. It is also helpful to those students who appear for TOEFL and IELTS.

COURSE CONTENT:

Unit I
Oral Communication: Basic concepts, scope and significance.

UNIT II
Fundamental of Spoken English: Essentials of Good Speaking; Dialogues, Public Speaking and Formal Presentations.

Unit III
Listening Skills: Essentials of good listening; Listening for various purposes.

Unit IV
Reading Skills: Basic concepts; Reading for various purposes; Reading print and visual texts (Advertisements, Documentaries, Fiction/non-fiction, Movies).

UNIT V
Body language and Paralanguage: Gestures, postures, facial expressions, tone, pitch, rhythm etc.

UNIT VI:
Oral Skills for Specific Situations: Interviews, Meetings and Group Discussion.

SUGGESTED READING:

1. *Body Language* Sudha Publications pvt. Ltd.,Delhi.
2. *Body Language at Work* by A. Furnham, University Press (India) Limited, Hyderabad.
3. *Listening Skills* by I. MacKay, University Press (India) Limited, Hyderabad.
4. *Presentation Skills* by S. Siddons, University Press (India) Limited, Hyderabad.
5. *Effective Presentation* by A. jay and R.Jay, University Press (India) Limited, Hyderabad.
6. *Reading Between the Lines* by McRae, Foundation Books (Cambridge University Press), New Delhi.
7. *Better English Pronunciation* by J.D.O.'Connor, Cambridge Univ. Press.,London.
8. *Cambridge practice Tests for IELTS 1 Book with 2 Cassettes* by Jakeman, Foundation Books (Cambridge University Press), New Delhi.
9. *Cambridge Preparation for the TOEFL Test* by Gear, Foundation Books (Cambridge University Press), New Delhi.
10. *Group Discussions/Interviews at a Glance*, Sudha Publications pvt. Ltd.,Delhi

SCHEME OF EXAMINATION:

(A) THEORETICAL: 60 marks

There will be five questions of 20 marks each covering all the units **except unit V.** The students are required to attempt any three questions. The questions may be set on the theory part of the elements from the units or students may be given some mock situations to be worked on. For the unit on Reading Skills, they may be given a manageable short text to be reviewed, summarised or to be analysed.

(B) PRACTICAL: 40 Marks

There will be an oral test to evaluate the spoken skills of the students. Besides evaluating clarity, fluency and spontaneity of the language, this test will look for how well the components of body language and para-language are integrated with the linguistic means. The students may be evaluated through presentation/mock-meeting or Group Discussion. Also they can be asked to face interviews in mock Situations. The time duration for this exam for every batch of 15 students will be of 3 hrs.

A panel of examiners appointed by the University will evaluate the oral competence of the students.

MATH-455-E LINEAR ALGEBRA
(ELECTIVE FOR CSE,IT)

L	T	P			
4	-	-	Class Work	:	50 Marks
			Exam.	:	100 Marks
			Total	:	150 Marks
			Duration of exam.	:	3 Hours

Unit-I & II :

Sets and examples of sets, operations on sets, relations, functions, binary operations, algebraic structures, operations on functions.

Unit-III & IV :

Vector spaces and their examples, subspaces, span of a set, linear dependence, linear independence, dimension and basis.

Unit-V :

Definition and examples of a linear transformation, range and kernel of a linear map, rank and nullity.

Unit-VI :

Inverse of a linear transformation, consequences of Rank nullity theorem, space L(U,V), composition of linear maps, operator equations.

Unit-VII :

Matrix associated with a linear map, linear map associated with a matrix, linear operations in Mm,n matrix multiplication, rank and nullity of a matrix.

Unit-VIII :

Transpose of a matrix and special types of matrices, elementary row operations, system of linear equations, matrix inversion.

Books Recommended :

1. An Introduction to Linear algebra by V. Krishnamurti et.al (EWP).
2. Linear Algebra by Hoffman & Kunze (PHI).

Note : Examiner will set eight questions, taking one from each unit. Students will be required to attempt any five questions.

CH-451E **ENVIRONMENTAL SCIENCE & ENGINEERING**
(Elective for EE,EL,ME,CSE & IT)

L	T	P
4	-	-

Sesstional	50 marks
Theory	100 marks
Total	150 marks

Environment & Ecology :
Introduction, component of environment, factors affecting environment objectives of environment management, segments of environment, atmosphere lithosphere, hydrosphere, biosphere, environmental pollution, classification of pollutants, types of pollutants. Ecology - Principle of ecology, environment and eco-factors (Medium & Biotic), Types of eco-system, ecological pyramids, Biogeochemical cycles in environment (sulphur cycle, phosphorus cycle, oxygen cycle, hydrological cycle-H cycle, Nitrogen cycle).

Waste Water & Its treatment processes :

Waste-water characteristics, effluent standards, primary treatment, secondary treatment – aerobic (activated sludge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB)

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

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.

BOOKS SUGGESTED:

1. Environmental Engg: by Howard S. Peavy & others, MGH International
2. Metcaf - 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.

Note: Eight questions will be set and students will be required to attempt five questions in all.

ELECTIVE-3

IT-464 E **Network Security & Management**

L	T	P
4	-	-

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

Unit-1: Introduction: Codes and Ciphers – Some Classifical systems – Stiatistical theory of cipher systems-Complexity theory of crypto systems – Stream ciphers, Block ciphers.

Unit-2: 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.
Public key systems – Knacksack systems – RSK – Diffle Hellman Exchange – Authentication and Digital signatures, Elliptic curve based systems.

Unit-3: System Identification and clustering: Cryptology of speech signals – narrow band and wide band systems – Analogue & Digital Systems of speech encryption.

Unit-4: 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.

Unit-5: 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:

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

Reference Books:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-412E Object Oriented Systems Development

L	T	P		
4	-	-	Class Work:	50
			Exam:	100
			Total:	150

Duration of Exam: 3 Hrs.

Unit-1: Introduction: Review of the Traditional Methodologies, Advantages of Object Oriented Methodologies over Traditional Methodologies, Classes, Objects, Encapsulation, Association, Aggregation, Inheritance, Polymorphism, States and Transitions.

Visual Modelling using Unified Modelling Language (UML): What is Visual Modelling? Object

Oriented Modelling, Introduction to Unified Modelling Language (UML): History of UML, Overview of UML – Capabilities, Usage of UML.

Introduction to Rational Rose CASE tool: Introduction – Importance of Rational Rose, Capabilities of Rational Rose Case Tool.

Unit-2 Introduction to Objectory Software Development Process: Introduction, Benefits, Phases and Iterations, Elaboration Stage, Construction Stage, Transition Stage.

Creating Use Case Diagrams: Actors and Use Cases, Use Case Relationships, Types of Relationships, Use Case Diagrams: Creating Main Use Case -,Relationships - , Additional Use Case - Diagrams in Rational Rose, Activity Diagrams Activities, Transitions, Decision Points, Swimlanes

Unit-3 Identifying Classes ,Packages and drawing a Class Diagram: State, Behaviour, Identity of Objects, Stereotypes and Classes, Creating and Documenting Classes in rational Rose, Packages, Drawing a Class Diagram Specifying Relationships : The Need of Defining Relationships, Association and Aggregation Relationships, Naming Relationships, Role Names, Multiplicity Indicators, Reflexive Relationships, Package Relationships, Inheritance, Finding Relationships, Creating Relationships in Rational Rose

Unit-4 Discovering Object Interactions: Documenting Scenarios using Interaction Diagrams, Types of Interaction Diagrams, Adding Behaviour and Structure: Representing Behaviour and Structure, Creating Attributes & operations and documenting them, Displaying attributes and operations, Association Classes, Analysing Object Behaviour: Modelling Dynamic Behaviour, States

Unit-5 Checking the Model: Making the Model Homogeneous, Combining Classes, Splitting Classes, Eliminating Classes, Consistency Checking, Scenario Walk-through, Event Tracing, Documentation Review, Designing the System Architecture : The need for Architecture, The "4+1" view of Architecture, The Logical view, The Component View, The Process View, The Deployment View, The Use Case view.

Unit-6 The Iteration Planning Process: Benefits, Goals, Design the User Interface, Adding Design Classes, The Emergence of Patterns, Designing Relationships, Designing Attributes and Operations, Designing for Inheritance, Coding, Testing, and Documenting the Iteration.

Text Books:

- "UML User Guide", Grady Booch, James Rumbaugh, Ivar Jacobson, 2000, Addison Wesley.
- Visual Modeling with Rational Rose 2000 and UMLBy Terry Quatrani Foreword by Grady Booch, 2000

Reference Books:

- "UML Reference Guide", James Rumbaugh, Ivar Jacobson, Grady Booch, 2000, Addison Wesley.
- "The Objectory Software Development Process", Ivar Jacobson, Grady Booch, James Rumbaugh, 1999, Addison Wesley.
- UML Distiled by Maxtin Fowler with Kendall Scott, 2000 ,Second Edition
- Sams Teach Yourself "UML" In 24 Hours By Joseph Schmuller , 2000

Note: Eight questions will be set in all by the examiners taking at least one question from each unit.

Students will be required to attempt five questions in all.

IT-466 E **Embedded Systems Design**

L	T	P
4	-	-

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

Unit-1: Real time operating system overview, exposure to Windows CE, QNX, Micro kernels and µc/OS of introduction to process models. Interrupt routines in an RTOs environment, encapsulating semaphores and queues, hard real-time scheduling considerations, saving memory space.

Unit-2: 16 & 32 bit microprocessor and micro-controller and DSP hardware with reference to Embedded system.

Unit-3: Embedded software development tools and compilers – host and target machines, linker/ locators for embedded software, cross compilers, cross assemblers and tool chairs, gce compiler, basic concept of device drivers, serial communication interface device driver.

Unit-4: System synthesis of Hardware/ software co-emulation, simulation speed of emulators. JTAG OCD

Unit-5: Communication protocols with special reference to embedded system. TCP/IP, VDP wireless protocols, IRDA, Blue tooth IEEE 8.8.11.

Text Books:

- An embedded system primer by David E Simon, 1999, Addison-Wesley
- Programming for Embedded system by Dreamtech software team, John wiley, 2002

Reference Books:

- TCP/IP Lean: Web servers for embedded systems by Jeramy Bentham, 2002
- Real –time programming: A guide to 32 bit embedded development, Rick Grehan, 1999, AW.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-468 E **Logic & Functional Programming**

L	T	P
4	-	-

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

Unit-1: Procedural and non-procedural lang., prolog vs LISP, Applications of LISP & PROLOG in designing expert system.

Unit-2: Syntax of PROLOG, Lists, Operators, Arithmetic, Structures, Controlling Back Tracking.

Unit-3: Input and Output, built-in predicates, Operation on Data Structures, Advanced Tree Representation.

Unit-4: Prolog in Artificial Intelligence: writing programs for search techniques, Constraint logic programming, Knowledge representation and expert system, Expert System Shell.

Unit-5: Planning, Machine Learning, Inductive Logic Programming, Qualitative Reasoning, Language Processing, Game Playing, Meta Programming.

Text Book:

- Prolog Programming for Artificial Intelligence by Ivan Bratko, 2001, Pearson Edu.

Reference Books:

- Symbolic Computing with Lisp & PROLOG - by Mueller, JW, 1998
- Programming in turbo PROLOG by Lee Teft - PHI.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-414E **Digital Image Processing**

L	T	P	Class Work:	50
4	-	-	Exam:	100
			Total:	150
			Duration of Exam: 3 Hrs.	

Unit-1: 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.

Unit-2: 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.

Unit-3: Image Restoration: Image Degradation/Restoration Process, Noise models, Restoration in presence of noise, Inverse Filtering, Minimum Mean Square Filtering, Geometric mean filter, Geometric transformations.

Unit-4: Color Image Processing: Color Fundamentals, Color models, Basis of full color image processing, Color transformations.

Unit-5: Image Compression: Fundamentals, Image compression models, Error free compression, Lossy compression.

Unit-6: Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region oriented segmentation.

Unit-7: 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.

Unit-8: Recognition: Pattern and pattern Classes, Decision-Theoretic Methods.

Text Book:

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

Reference Book:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

PHY-452-E LASER TECHNOLOGY

(Elective for EE,EL,CSE,IT,IC)

L	T	P			
4	-	-	Class Work	:	50 Marks
			Exam.	:	100 Marks
			Total	:	150 Marks
			Duration of Exam.	:	3 Hours.

Conditions for Producing Laser, Concept of coherence – Special and temporal,Population Inversions, Einstein coefficient, Gain and Gain saturation, Saturation intensity, Development and Growth of a Laser Beam, Exponential Growth factor, Threshold Requirement for a Laser.

Inversions and two-level systems, steady-state inversions and three and four-level systems. Transient Population Inversions, Factors effecting population inversion, Laser Amplifiers.

Excitation or Pumping Threshold Requirements, Pumping Pathways, Specific Excitation Parameters Associated with Optical and particle Pumping.

Helium-Neon Laser, Co_2 Laser, Ruby Laser, Semiconductor Diode Laser.

RECOMMENDED BOOKS:

1. Laser Fundamentals by William T. Silfvast Cambridge University, Press.
2. Introductory University Optics by John Beynon, (PHI)
3. Laser – B.B. Laud.
4. Optics – A.K. Ghatak (TMH)

Note : Eight questions will be set and students will be required to attempt any five questions in all. All questions will carry equal marks.

HUM-456-E MARKETING MANAGEMENT

VIIITH SEMESTER (ELECTIVE)

L	T	P
4	-	-

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

Unit-I

Definition of Marketing and Marketing Management-Nature, scope and importance of Marketing. The Evolution of concepts in Marketing- The Production concept, The Selling concept, The modern Marketing Concept. The Societal concept. The Marketing System.

Unit-II

Elements of marketing mix. Market segmentation-Meaning, importance and basis of market segmentation. Target marketing, market segmentation Vs target marketing.

Unit-III

Product-concepts and types. Product life cycle, New Product development and its process. Branding, packaging and trademark decisions.

Unit-IV

Pricing-Objectives and importance, strategies. Pricing practices and methods.

Unit-V

Distribution-Process of distribution, types, marketing channel decisions and their importance.

Unit-VI

Marketing Promotion-Meaning, Marketing communication, Advertising, Sales Promotion, Publicity-their concepts and relative importance. Selection of media. Salesmanship - importance, duties, responsibilities, Training & methods of training.

Unit-VII

Marketing Information System-Meaning, techniques and importance. Marketing
Research-Meaning, Objective and its process.

Text Books :

1. Introduction to Marketing & Salesmanship - J.C. Sinha - R.Chandra & Co.
2. Modern Marketing management - C.J. George, K.C. Nair, J.John - Himalya Publishing House.
3. Modern Marketing Management - Rustam S. Dawar - Universal Book Stall.

Reference Books :

1. Modern Marketing - R.S.N. Pillai & V. Bagvati - S. Chandra & Co.
2. Marketing Management – Phlip Kotler – Prentice Hall of India Pvt. Ltd.
3. Marketing Management – T.N. Chhabra, S.K. Grover – Dhanpat Rai & Co.
4. Marketing Management – S.A. Sherlekar – Himalaya Publishing House, Bombay
5. Basic Marketing – Cundiff and Still – PHI India.

Note: Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

MATH-202-E NUMERICAL METHODS

(COMMON FOR EE,EL,CHE,EI,IC & ELECTIVE FOR CSE,IT IN 8th SEM.)

L	T	P			
3	1	-	Sessional	:	50 Marks
			Exam.	:	100 Marks
			Total	:	150 Marks
			Duration of exam.	:	3 Hours

Part-A

Interpolation and curve fitting : Interpolation problem, Lagrangian polynomials, Divided differences, Interpolating with a cubic spline, Bezier curves and B-spline curves, Least square approximations.

Non-Linear Equations : Bisection method, Linear Interpolation methods, Newton's method, Muller's method, fixed-point method.

Simultaneous Linear Equations : Elimination method, Gauss and Gauss-Jordan method, Jacobi's method, Gauss-Seidal method, Relaxation method.

Numerical Differentiation and Integration : Derivatives from differences tables, Higher order derivatives, Extrapolation techniques, Newton-cotes integration formula, Trapezoidal rule, Simpson's rules, Boole's rule and Weddle's rule, Romberg's Integration.

Part-B

Numerical Solution of Ordinary Differential Equations : Taylor series method, Euler and modified Euler method, Runge-Kutta methods, Milne's method, Adams-Moulton method, Power method for Eigen values by iteration.

Numerial Solution of Partial Differential Equations : Finite difference approximations of partial derivatives, solution of Laplace equation (Standard 5-point formula only), one-dimensional heat equation (Schmidt method, Crank-Nicolson method, Dufort and Frankel method) and wave equation.

TEXT BOOKS :

1. Applied Numerical Analysis : Curtis F. Gerald and Patrick G. Wheatley-Pearson, Education Ltd.
2. Numerical Method : E. Balagurusamy T.M.H.

REFERENCE BOOKS :

1. Numerical Methods for Scientific and Engg. Computations : M.K. Jain, S.R.K. Iyenger and R.K. Jain-Wiley Eastern Ltd.
2. Introductory Methods of Numerical Analysis S.S. Sastry, P.H.I.
3. Numerical Methods in Engg. & Science : B.S. Grewal.

Note: Examiner will set eight questions, taking four from Part-A and four from Part-B. Students will be required to attempt five questions taking atleast two from each part.

ELECTIVES-4

HUM-202-E FUNDAMENTALS OF MANAGEMENT

L	T	P
3	1	-

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

UNIT-I

Meaning of management, Definitions of Management, Characteristics of management, Management Vs. Administration. Management-Art, Science and Profession. Importance of Management. Development of Management thoughts. Principles of Management. The Management Functions, Inter-relationship of Managerial functions.

UNIT-II

Nature and Significance of staffing, Personnel management, Functions of personnel management, Manpower planning, Process of manpower planning, Recruitment, Selection; Promotion - Seniority Vs. Merit. Training - objectives and types of training.

UNIT-III

Production Management : Definition, Objectives, Functions and Scope, Production Planning and Control; its significance, stages in production planning and control. Brief introduction to the concepts of material management, inventory control; its importance and various methods.

UNIT-IV

Marketing Management - Definition of marketing, Marketing concept, objectives & Functions of marketing. Marketing Research - Meaning; Definition; objectives; Importance; Limitations; Process. Advertising - meaning of advertising, objectives, functions, criticism.

UNIT-V

Introduction of Financial Management, Objectives of Financial Management, Functions and Importance of Financial Management. Brief Introduction to the concept of capital structure and various sources of finance.

BOOKS RECOMMENDED :

TEXT BOOKS :

1. Principles and Practice of Management - R.S. Gupta, B.D.Sharma, N.S. Bhalla. (Kalyani Publishers)
2. Organisation and Management - R.D. Aggarwal (Tata Mc Graw Hill)

REFERENCE BOOKS :

1. Principles & Practices of Management – L.M. Prasad (Sultan Chand & Sons)
2. Management – Harold, Koontz and Cyrilo Donell (Mc.Graw Hill).
3. Marketing Management – S.A. Sherlikar (Himalaya Publishing House, Bombay).
4. Financial Management - I.M. Pandey (Vikas Publishing House, New Delhi)
5. Management - James A.F. Stoner & R.Edward Freeman, PHI.

NOTE: Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

IT-470E **Web Engineering**

L	T	P
4	-	-

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

Unit-1: Information Architecture: The role of the Information Architect, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites and Intranets, Creating Cohesive Organization Systems Designing Navigation Systems, Types of Navigation systems, Integrated Navigation Elements, Remote Navigation Elements, Designing Elegant Navigation Systems, Searching Systems, Searching your Web Site, Designing the Search Interface, Indexing the Right Stuff, To search or Not To Search, Grouping Content, Conceptual Design, High-Level Architecture Blueprints, Architectural Page Mockups, Design Sketches.

Unit-2: Dynamic HTML and Web Designing: HTML Basic Concepts, Good Web Design, Process of Web Publishing, Phases of Web Site development, Structure of HTML documents, HTML Elements-Core attributes, Language attributes, Core Events, Block Level Events, Text Level Events, Linking Basics, Linking in HTML, Images and Anchors, Anchor Attributes, Image maps, Semantic Linking Meta Information, Image Preliminaries, Image Download Issues, Image as Buttons, Introduction to Layout: Backgrounds, Colors and Text, Fonts, Layout with Tables. Advanced Layout: Frames and Layers, HTML and other media types. Audio Support in Browsers, Video Support, Other binary Formats. Style Sheets, Positioning with Style sheets. Basic Interactivity and HTML: FORMS, Form Control, New and emerging Form elements.

Unit-3: Java Server Pages and Active Server Pages: Basics, Integrating Script, JSP/ASP Objects and Components, configuring and troubleshooting,: Request and response objects, Retrieving the contents of a an HTML form, Retrieving a Query String, Cookies, Creating and Reading Cookies. Using application Objects and Events.

Unit-4: Overview of advance features of XML

Text Books:

- HTML The complete Reference, TMH
- CGI Programming with Perl 2/e, Scott Guelich, Shishir Gundavaram, Gunther Birzniek; O'Reilly
- Doug Tidwell, James Snell, Pavel Kulchenko; Programming Web Services with SOAP, O' Reilly
- Pardi, XML in Action, Web Technology, PHI

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

MATH-402-E OPERATIONS RESEARCH

(Compulsory for Chemical Engg. Elective for CSE,IT,EE,EL)

L	T	P			
3	1	-	Class Work	:	50 Marks
			Exam.	:	100 Marks
			Total	:	150 Marks
			Duration of exam.	:	3 Hours

Unit-I :

The origin of OR, Phases of an O.R. study, Impact of OR, Formulation of Linear-programming model, Graphical solution. Converting the linear programming problem to standard form, Simplex method.

Unit-II :

Big-M method, Two-Phase method, Degeneracy, Alternate optima, unbounded and infeasible solution.

Unit-III :

Definition of the dual problem, primal-dual relationship, Dual Simplex method, Postoptimal and sensitivity analysis.

Unit-IV & V :

Assignment problem and its mathematical formulation, solution of assignment problem (Hyngarian method), Transportation problem and its mathematical formulation, Initial basic feasible solution of transportation problem by North-West corner rule, Lowest-Cost Entry method and Vogel's Approximation method, Optimal solution of transportation problem.

Unit-VI :

Network models, Minimal spanning tree algorithm, Shortest-route problem (Floyd's Algorithm and Dijkstras algoritham),Maximal flow problem, Introduction to CPM & PERT.

Unit-VII :

Introduction to Dynamic Programming, General inventory Model, Static Economic Order Quantity (EOQ) Models.

Unit-VIII :

Elements of a Queuing model, Pure Birth & Death model, Generalized Poisson Queuing model, Specialized Poisson Queues.

Books Recommended :

1. Operations Research by Hamdy A. Taha.
2. Introduction to Operations Research by Hiller and Dieherman, TMH.
3. Optimization Theory and Application : S.S. Rao, John Wiley.

Note : Examiner will set eight questions, taking one from each unit. Students will be required to attempt any five questions.

IT-472 E **Introduction to VLSI Design**

L	T	P
4	-	-

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

Unit-1: Crystal Growth: MGS, EGS, Czochralspi crystal Puller, Silicon shaping, Wafer Preparation. Epitaxy: Vapour Phase Epitaxy, Epitaxial Layer evaluation Molcullar Beam Epitaxy.

Unit-2: Oxidation: Thermal Oxidation Kinetics, Oxidation techniques, Oxide Properties, Oxidation induced Defects. Lithography: Photolithography, e-beam lithography, X ray Lithography.

Unit-3: 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.

Unit-4: 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.

Unit-5: Metallization: Metallization applications, Choices, Physical Vapour Deposition. Sputtcring, Metallization Problems. Assembly & Packaging: Package Types, design considerations, Package fabrication technologies, Future trends.

Unit-6: Isolation techniques: Bipolar IC fabrication Process Sequence. n MOS IC fabrication Process Sequence.

Text Books:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE-416E **Social and Professional Issues in IT**

L	T	P
4	-	-

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

Unit-1: Legal Issues: Introduction to legal concepts, Basic outline of Criminal and Civil Laws, Concepts relating to laws of Contract and Commercial Law, Substantive Legal Issues, Intellectual property Issues, Cyber crime, Data protection principles and implications of the European Union Data Protection Directive, Confidentiality and privacy, Intellectual property rights, Copyright and Industrial Property, Patents, Trade Marks and laws relating to designs, Software Protection and piracy, Dealing with Copyright, Originality, Exception to Copyright infringement, Employees and freelance programs, devices to overcome protection Software Licensing , Methods of licensing, Copyright and electronic publishing , Copyright problems posed by electronic publishing.

Unit-2 Multimedia, licensing and related issues: Protection of Databases, Trade marks and passing off, Internet related issues, Contract issues and Law, Basic understanding of the Types of Agreements in large computerization projects – Implementation Agreements, License Agreements, Maintenance agreements etc., Enforcement issues, dispute resolution, arbitration, legislative action,

Unit-3 Other Professional Issues: Duties of a professional, Duties to client, Duties to Employer, Duties to profession, Duties to society, Accountability for quality, timeliness and use of resources, Human relationships and change management, Avoiding computer misuse, Hacking, unauthorized access and types of Computer Crime, Introduction of Viruses, Fraud and types of Computer Fraud, Public interest and Social implications, Environmental protection, Health and safety issues, Privacy, Ethics and Codes of Professional Conduct, The need for professional ethics, Characteristics of professions, Integrity & Honesty, Competence, Professional development, judgment, knowledge of law, relations, standards, independence, Acting with responsibility, professional skill, comply with law, Confidentiality, due care, Contribute towards advancement of human welfare, Public interest, Public awareness, Basic human rights, Ethics and the Internet, Netiquette and Policy approaches, Professional relationships, Are computer professionals "Professionals", Conflicting responsibilities and misconduct, Codes of Ethics: Relationship between Code of ethics and professional conduct. Case study of some professional body such as Computer Society of India /BCS(UK).

Text Book:

- Professional Issues in Software Engineering (2nd edition.), Bott F. et al., 1995, UCL Press.

Reference Books:

- (Eds), The Responsible Software Engineer: Selected Readings in IT Professionalism, Myers C., Hall T. and Pitt D., 1997, Springer
- BCS code of conduct: http://www.bcs.org/docs/01100/1194/pdf/codeofc.pdf
- BCS Code of Practice: http://www1.bcs.org/docs/01100/1194/Cop.htm
- ACS code of Ethics http://203.58.197.209/acs/events_admin/static/national/pospaper/acs131.htm

Note: Eight questions will be set in all by the examiners taking at least two question from each unit. Students will be required to attempt five questions in all.

CSE 418 **Human Computer Interaction**

L	T	P	Class Work:	50
4	-	-	Exam:	100
			Total:	150
			Duration of Exam:	3 Hrs.

Unit 1: 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

Unit 2: 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

Unit 3: 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

Unit 4: Principles guiding well-designed human-system interaction:

- Paradigms for interaction, Principles to support usability, Accounting for users with disabilities

Unit 5: 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

Unit 6: The design process - task and user needs analysis:

- Task analysis definition, Techniques for task analysis, Sources of information

Unit 7: 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

Unit 8: Designing for universal access:

- What is accessibility? What is accessible software, Examples of accessibility adaptations, What's driving software accessibility, Implications for software organizations

Unit 9: Speech user interfaces:

- Attributes of speech user interfaces, Evaluating speech user interface quality

Unit 10: HCI in mission-critical and high-risk environments:

- Safety implications of human-computer interaction, Effects of automation, Addressing the effects

Text books:

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

Reference Books:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

CSE 420E **Fuzzy Logic**

L	T	P
4	-	-

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

Unit - 1 Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, a-cuts, Properties of a-cuts, Decomposition, Theorems, Extension Principle,

Unit - 2 Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations

Unit - 3 Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.

Unit - 4 Fuzzy Relations: Crisp & Fuzzy Relations, Projections & Cylindric Extensions, Binary Fuzzy Relations, Binary Relations on single set, Equivalence, Compatibility & Ordering Relations, Morphisms, Fuzzy Relation Equations.

Unit – 5 Possibility Theory: Fuzzy Measures, Evidence & Possibility Theory, Possibility versus Probability Theory.

Unit – 6 Fuzzy Logic: Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

Unit – 7 Uncertainty based Information: Information & Uncertainity, Nonspecificity of Fuzzy & Crisp sets, Fuzziness of Fuzzy Sets.

Unit – 8 Applications of Fuzzy Logic in soft computing.

Text / Reference books:

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

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.