Punjab Technical University

Jalandhar

Syllabus Scheme

(3rd to 8th Semester)

For

Bachelor of Technology in

Computer Science

For 2002 Batch

Punjab Technical University, Jalandhar
B.Tech. Computer Science Engg.
Scheme of Syllabi 3rd Semester

Sr. No.	COURSE CODE	COURSE TITLE	HOURS/WEEK			MARKS		
			L	T	P	INT	EXT	TOTAL
1.	CS-201	Computer Architecture	3	1	-	40	60	100
2.	CS-203	Mathematics – III	3	1	-	40	60	100
3.	CS-205	Digital Circuits & Logic Design	3	1	-	40	60	100
4. .	CS-207	Data Structures & Programming Methodology	3	1	-	40	60	100
5.	CS-209	Written & Oral Technical Communication	2	1	-	40	60	100
6.	CS-211	Programming Languages	3	1	-	40	60	100
7.	CS-213	Software Lab- I (DSPM)	-	-	3	30	20	50
8.	CS-215	Institutional Practical Training	-	-	-	60	40	100
9.	CS-217	Hardware Lab -I (DCLD)	-	-	2	30	20	50
10.	CS-219	Software Lab - II (PL)	-	-	3	30	**20**	**50**
Total (31 Hours)			**17**	**6**	**8**	**390**	**460**	**850**

Punjab Technical University, Jalandhar
B.Tech. Computer Science Engg.
Scheme of Syllabi 4th Semester

Sr. No.	Course Code	Course Title	L	T	P	Ext.	Int.	Total
1	CS-202	Operating System	3	1	-	60	40	100
2	CS-204	Discrete Structures	3	1	-	60	40	100
3	CS-206	Data Communication	3	1	-	60	40	100
4	CS-208	Microprocessor & Assembly Language Programming	3	1	-	60	40	100
5	CS-210	Systems Programming	3	1	-	60	40	100
6	CS-212	Software Lab - III (OS)	-	-	2	20	30	50
7	CS-214	H/W Lab. II (DC)	-	-	2	20	30	50
8	CS-216	H/W Lab. III (Microprocessor & assembly Language)	-	-	2	20	30	50
9	CS-218	Software Lab-III(SP)	-	-	4	20	30	50
		General Fitness						100
		TOTAL (30 Hours)	**15**		**5** **10**			**800**
	CS-220	Industrial Institutional Training	*6 weeks		- -			
			2 months during Break					

Punjab Technical University, Jalandhar
B.Tech. Computer Science Engg.
Scheme of Syllabi 5th Semester

Sr. No.	COURSE CODE	COURSE TITLE	HOURS/WEEK			MARKS		
			L	T	P	INT	EXT	TOTAL
1.	CS-301	System Analysis and Design	3	1	-	40	60	100
2.	CS-303	Computer Networks	3	1	-	40	60	100
3.	CS-305	DBMS	3	1	-	40	60	100
4.	CS-307	Design and Analysis of Algorithms	3	1	-	40	60	100
5.	CS-309	Computer Graphics	3	1	-	40	60	100
6.	CS-311	Computer Peripherals and Interfaces	3	1	-	40	60	100
7.	CS-313	Software Lab-IV(DBMS Lab)	-	-	4	30	20	50
8.	CS-315	H/W lab-IV(Data Communication)	-	-	2	30	20	50
9.	CS-317	Software Lab V(Algorithms)	-	-	2	30	20	50
10.	CS-319	S/W Lab VI(Computer Graphics)	-	-	2	30	20	50
		Industrial Training				60	40	100
Total			**18**	**6**	**10**	**420**	**480**	**900**

There should be institutional/industrial training of 6 week in summer vacation after 4th semester

Punjab Technical University, Jalandhar
B.Tech. Computer Science Engg.
Scheme of Syllabi 6th / 7th Semester

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Sr. No.	COURSE CODE	COURSE TITLE	HOURS/WEEK			MARKS		
			L	T	P	INT	EXT	TOTAL
1.	CS-302	Relational Database Management System-II	3	1	-	40	60	100
2.	CS-304	Introduction to Business System	3	1	-	40	60	100
3.	CS-306	Asynchronous Transfer Mode	3	1	-	40	60	100
4.	CS-308	Software Engineering	3	1	-	40	60	100
5.		Elective –I	3	1	-	40	60	100
6.	CS-312	Open Elective	3	1	-	40	60	100
7.	CS-314	H/W Lab-V(ATM)	-	-	4	30	20	50
8.	CS-316	S/W Lab-VII(RDBMS-II)	-	-	4	30	20	50
9.	CS-318	S/W Lab-VIII(S/W Engg.)	-	-	2	30	20	50
10.	CS-320	S/W Lab-IX(Business System)	-	-	2	30	20	50
		General Fitness					100	
Total (36 Hours)			**18**	**6**	**12**	**360**	**540**	**900**

Open Elective

CS - 312 COMPUTERS AND SOCIETY (For other branches only)

Elective: I

CS-310 Computer Vision
CS-322 System Hardware Design
CS-324 Real Time Systems
CS-326 Operation Research
CS-328 Language Processor
CS-330 Natural Language Processing

Punjab Technical University, Jalandhar
B.Tech. Computer Science Engg.
Scheme of Syllabi 6th / 7th Semester

	Course Title		Internal	Ext.Viva	TOTAL
	6-month Industrial Training		500	500	**1000**

Punjab Technical University, Jalandhar
B.Tech. Computer Science Engg.
Scheme of Syllabi 8th Semester

Sr. No.	COURSE CODE	COURSE TITLE	HOURS/WEEK			MARKS		
			L	T	P	INT	EXT	TOTAL
1.	CS-402	Symbolic Logic & Logic Processing	3	1	-	40	60	100
2.	CS-404	Formal Language & Automata Theory	3	1	-	40	60	100
3.	CS-406	Project	-	-	8	100	100	200
4.	CS-408	Principles of Engineering .Ecomonics & Management Techniques	3	1	-	40	60	100
5.	CE-216	Environmental Sciences	3	1	-	40	60	100
6.		Department elective –II	3	1	-	40	60	100
7.		Department Elective-III	3	1	-	40	60	100
8.		Department Elective-III Lab	-	-	2	30	20	50
9.	CS-416	Software Lab – XIII(SI&LP)	-	-	2	30	20	50
		General fitness						100
Total (35 Hours)			**18**	**6**	**12**	**400**	**500**	**1000**

List of Electives -II

I. CS-410 Organisational Structure
II. CS-416 Overview of IT Materials
III. CS-418 System Simulation and Modelling
IV. CS-420 Emerging Technologies and Current IT- Trends

List of Electives-III

I. CS-412 Graphical User Interface
II. CS-422 Advanced Microprocessor
III. CS-424 Expert System.
IV. CS-426 Image Processing & Pattern recognition

Labs of Elective-III

I. CS-414 Graphical User Interface
II. CS-428 Advanced Microprocessor
III. CS-430 Expert System.
IV. CS-432 Image Processing & Pattern recognition

THIRD SEMESTER

CS-201 COMPUTER ARCHITECTURE

L	T	P
3	1	-

PREREQUISTES : None

OBJECTIVES : This course offers a good understanding of the various functional units of a computer system and prepares the student to be in a position to design a basic computer system. Finally the student will be exposed to the recent trends in parallel and distributed computing and multithreaded application.

COURSE CONTENTS :

Principles of computer design - software / hardware interaction, cost/benefit concept of layers in architecture design 10%]

Basic Computer Organization taking 8085 as an example binary arithmetic - add, subtract, multiply - algorithms and implementations. carry look ahead add fast adders. [15%]

CPU design - Choice of instruction set control structure hardwired and microprogrammed control - RISC vs CISC, Pipelining in CPU design superscalar machines. [15%]

Memory hierarchy design caches, main memory, Interleave memory virtual memory architectural aids in implementing these. [10%]

I/O Modes- program interrupt, DMA, Channel, I/O Processor. [15%]

I/O performance measures - Buses connecting I/O devices to CPU/memory - interaction with operating system Serial/Parallel Interfaces taking 8251 and 8255 as examples. [15%]

Performance evaluation SPEC marks LINPACK Whetstone Dhrystone etc., Transaction processing benchmarks. [10%]

Multiprocessors - Parallel & distributed computers - SIMD SPMD and MIMD machines. [10%]

TEXT / REFERENCES :

Patterson and Hennessy, Computer Architectures, Morgaon Kauffman, San Mateo, CA, USA, 1992.
P.Pal Chaudhary, Computer Organization and Design Prentice Hall of India Pvt. Ltd., New Delhi, 1994.
P.V.S. Rao, Perspectives in Computer Architecture, Prentice Hall of India Pvt. Ltd., NEW Delhi,1994.
M.R. Bhujade, Digital Computer Design Principles, Pitamber Publishing Co., 3rd Edition, 1996.

CS-203 MATHEMATICS - III

L T P
3 1 -

PREREQUISITES: Calculus of two variables and exposure to mathematics-I and Mathematics - II.

OBJECTIVES:

To teach Engineering Mathematics to the students.

COURSE CONTENTS:

Review of the prerequisites such as limits of sequences and functions. Continuity, uniform continuity and differentiability. Rolls theorem, mean value theorems and Taylor's theorem. Newton method for approximate solution Riemann integral and the fundamental theorem of integral calculus. Approximate integration. Applications to length area, volume, surface area of revolution, Moments, centers of Mass and Gravity.

Repeated and multiple integrals with applications to volume, surface area, moments of inertia etc. Analytic functions, Cauchy-Riemann equations, Laplace equation, elementary functions, Cauchy's integral theorem(Proof by using Greens theorem), Cauchy's integral formula, Taylor series and Laurent series. [33%

Residues and applications to evaluating real improper integrals and inverse Laplace transforms. Conformal mapping, linear fractional transformations. [17%]

Boundary value problems involving partial differential equations such as wave equation, heat equation, Laplace equations . Solutions by the method of separation of variables and by Fourier and Laplace transforms. [33%]

Numerical Methods for ODEs and PDEs. [17%]

TEXTS /REFERENCE :

E.Kreyszig, Advanced Engineering Mathematics, 5th Edition, Wiley Enstern 1985.
P.E.Danko, A.G.Popov, T.Y.A Kaznevnikova, Higher Mathematics in Problems and Exercises, Part 2, Mir Publishers, 1983.

CS-205 DIGITAL CIRCUITS AND LOGIC DESIGN.

L T P
3 1 -

PREREQUISITES: None

OBJECTIVES:
To give students basic ideas regarding digital hardware components at the level of gate and sequential circuits. To treat logic design and making them familiar with the CAD tools in digital system design.

COURSE CONTENTS:
Data and number representation-binary-complement representation BCD-ASCII, ISCII. [15%]

Boolean algebra, logic gates, minimization, use of programs such as expresso in minimization. [5%]

Digital Circuit Technologies, RTL/DTL/DCTL/TTL/MOS/CMOS/ECL, analysis of basic circuits in these families, internal architecture of programmable logic devices. [10%]

Combinational design , design with Muxes. [5%]

Sequential circuits, flip-flops, counters, shift registers, multivibrators, state diagrams, sequential circuit design from state diagrams computer aids in synthesis. [15%]

Memory system - RAM., ROM, EPROM, EEPROM, PAL, PLDs,PGAs. [20%]

Bus structures, transmission line effects, line termination. [10%]
A/D and D/A conversion techniques and selected case studies. [15%]

Introduction to VLSI Design , Custom and semi-custom design. [5%]

TEXT /REFERENCES:

Morris Mano, Digital Design- Prentice Hall of India Pvt. Ltd
Jesse H Jenkins,Designing with FPGAs and CPLDs , PTR Prentice Hall, Englewood Cliffs
H.Taub & D. Schilling, Digital Integrated Electronics, McGraw Hill
Douglas L. Perry, VHDL, McGraw Hill, Inc., 2nd Edition, 1993.
Mead and L. Conway, Introduction to VLSI Systems, Addition Wesley, 1979.
R. Viswanathan , G. K. Meat and V.Rajaraman, "Electronics for Scientist and Engineers". Prentice Hall of India Pvt. Ltd. 1978
J.Millman and Halkias, "Integrated Electronics, Analog and Digital Circuits and Systems, Tata McGraw Hill ,1972.

CS-207 DATA STRUCTURES & PROGRAMMING METHODOLOGY

L T P
3 1 -

PREREQUISITES:
The algorithms presented should be written in a pseudocode similar to the programming language Pascal / C and therefore, the readers should preferable be familiar with Pascal / C. The experience in structured programming and knowledge of combinatorial mathematics would be helpful.

OBJECTIVES:
The course should provide one with a fairly good concept of the fundamentals of data structures and also of the commonly occurring algorithms. The mathematical model of data is an abstract concept of data such as set, list or graph. To make it useful for problem solving the abstraction is made concrete by going into the data structure of the model- its implementation and associated algorithms. Given a data structure, quite frequently , several alternative algorithms exist for the same operation. Naturally, the question analyzing an algorithm to determine its performance in relation to the other alternatives becomes important. The course should present the general approach towards analyzing and evaluating algorithms and while presenting an algorithm, its analysis should also be included as and when required.

COURSE CONTENTS:

Introduction [8%]

Linear Data Structures I: Arrays & Records [5%]

Linear Data Structures II: linked lists [10%]

Linear Data Structures III: Stacks and Queues [5%]

Linear Data Structures IV: Strings [5%]

Recursion [10%]

Non Linear Data Structures I: Trees [8%]

Non Linear Data Structures II [10%]

Hashing. [10%]

Sets [12%]

Graphs [12%]

Files [5%]

TEXTS / REFERENCES :

Aho A. V., J. E. Hopcroft, J.D. Ullman; Data Structures and Algorithms, Addison-Wesley, 1983

Baase, S Computer Algorithms: Introduction to Design and Analysis, Addition - Wesley , 1978.

Berztiss, A.T.: Data structures, Theory and Practice : 2nd ed., Academic Press, 1977. Collins, W. J. Data Structures, An Object-Oriented Approach, Addition-Wesley, 1992.

Goodman, S.E., S.T.Hedetniemi: Introduction to the Design and Analysis of Algorithms. McGrow- Hill, 1977

Horowitz, E., S. Sahni : Algorithms: Design and Analysis, Computer Science Press, 1977

. Horowitz E., S. Sahni: Fundamentals of Data Structures in PASCAL, Computer Science Press, 1984.

Knuth, D.E.: The Art of Computer Programming , Vols 1-3, Addition-Wesley, 1973.

Kruse, R. L. Data Structures and Program Design , 2nd Ed., Prentice Hall, 1987.

Lorin, H.: Sorting and sort Systems, Addition-Wesley, 1975.

Standish, T.A.: Data Structure Techniques, Addition-Wesley, 1980. Tremblay, J.P., P.G. Sorenson: An Introduction to Data Structures with Applications, McGraw - Hill , 1976.

Wirth, N.: Algorithms + Data Structures = Programs, Prentice-Hall. 1976.

CS-209 WRITTEN & ORAL TECHNICAL COMMUNICATION

(Communication skills for Scientists and Engineers)

L T P
2 1 -

PREREQUISITES : NONE

OBJECTIVES:

The course is intended to develop a student's ability to communicate both in speech and writing in the Situation that he/she is likely to come across in his/her academic and working life.

COURSE CONTENTS:

Note taking from lectures and reference material [10%]

Essay and précis writing [30%]

Slide preparation and oral presentation principles [10%]

Written presentation of technical material [20%]

Preparation of Bibliography [10%]

Basics of Official Correspondence [15%]

Preparation of bio-data [5%]

Students should be asked to prepare and present Seminars during the practice session.

TEXTS/REFERENCES

The Chicago Manual of Style, 13th Edition, Prentice Hall of India 1989.

Gowers Ernest, "The Complete Plan in Words" Penguin, 1973.

Menzel D.H., Jones H.M, Boyd, LG., "Writing a Technical Paper". McGraw Hill, 1961.

Strunk, W., & White E.B., "The Elements of Style", 3rd Edition , McMillan, 1979.

Turbian K.L., "A Manual for Writers of Term Papers, Thesis and dissertations" Univ of Chicago Press, 1973.

IEEE Transactions on "Written and Oral Communication" has many papers.

CS - 211 PROGRAMMING LANGUAGES

L T P

3 1 -

OBJECTIVES:

At the end of this course students will be able to simulate the problems in the subjects like O.S., C.N., System project , System simulate and modelling etc. Moreover it will be used as a tool for doing minor and major Projects.

INTRODUCTION :

C and C++ programming, differences between C and C++ , adding an user interface to C and C++ program, standard C and C++ data types , storage classes, operators Standard C and C++ libraries, writing & using functions, arrays pointer , I/O in C, Structure unions, macro's Advanced preprocessor statements, dynamic memory allocation .

OBJECT ORIENTED PROGRAMMING:

Object oriented terminology, C++ classes I/O M C++, the cost team class list combining C & C++ code, designing Unique manipulators , Object oriented stack and linked list in C++

WINDOWS PROGRAMMING FOUNDATIONS :

Windows concepts windows programming concept , visual C++ Windows tools, procedure -oriented windows Application Microsoft foundation Class library concepts. Windows Applications with MFC. WIZARDS: Application and class Wizards, introduction to OLE, active X controls with the MFC library.

.Net Framework:-

Introduction to .Net framework, concept of CLR. Managed and un-managed code in VC++. Concept of Assemblies.

BOOKS:-

The complete Reference Visual C++5 Chris H. Pappas & William H. Murray, III

The Visual C++ handbook Chris H. Pappas & William Murray Osborne

CS- 213 Software Lab-I (DSPM)

L T P

- - 3

DATA STRUCTURES & PROGRAMMING METHODOLOGY LAB.

Algorithm development in all areas of data structures covered in the course. Emphasis should be given on the following matters. Development of recursive as well as non recursive a algorithms involving linked list trees and graphs. Use of pointers for dynamic allocations of storage. Development of classes for some of the data structures using the concept of abstract data types.

CS- 217 Hardware Lab-I (Digital Circuit and Logic Design)

L T P

- - 2

1. 1. Verification of the truth tables of TTL gates, e.g., 7400, 7402,7404, 7408, 7432, 7486.
2. 2. Design, fabrication and testing of low frequency TTL clocks using NAND gates.
3. Verification of the truth table of the Multiplexer 74150.
4. Verification of the truth table of the De-Multiplexer 74154.

5. Design and verification of the truth tables of half adder and full adder circuits using gates 7483.

6. (a)Design and test of an SR flip flop using Nor/Nand gates.
   (b)Verify the truth table of a J-K flip flop.(7476)
   (c)Verify the truth table of a D-flip flop (7474) and study its operation in the toggle and asynchronous modes.
7. (a) To study the operation of 2 bit and 4 bit asynchronous counters.
   (b) To study the operation of 2 bit and 4 bit synchronous counters.
8. To study the operation of 2 bit and 4 bit Johnson counters.

CS- 219 Software Lab-II (Programming Languages)

L T P

- - 3

PROGRAMMING LANGUAGES LAB

Students should be asked to write programs in C & C++ using different statements , Libraries and Functions , Designing Unique Manipulators etc.

FOURTH SEMESTER

CS – 202 OPERATING SYSTEM

L	T	P
3	1	-

PREREQUISITES:

Computer Systems programming and Data Structures.

OBJECTIVES:

Understand the overall architecture of the operating system and its main components, Functions of Kernel, file system architecture and implementation, concurrent programming and concurrency .

COURSE CONTENTS:

Introduction to Operating system, computer system structure , operating system structure, process management, CPU scheduling , process synchronization, deadlocks[35%]

Memory management paging and segmentation virtual memories[20%]

I./O system and secondary storage structure [10%]

Protection and security [10%]

Introduction to multiprocessor and distributed operating systems. [20%]

Case Studies: LINUX , UNIX Operating System with SOLARIS and SCO-UNIX [15%]

TEXT BOOKS

1. A Silberschatz and Peter B. Calvin, " Operating System Concepts" Addison Wesley Publishing Company
2. Dhamdhere, " Systems Programming & Operating Systems Tata McGraw Hill

REFERENCES

1. Operating System by Madnick Donovan
2. Operating System by Stallings

CS - 204 DISCRETE STRUCTURES

L T P
3 1 -

PREREQUISITES :

Mathematics & Data Structures

OBJECTIVES

The objective of this course is to provide the necessary back ground of discrete structures with particular reference to the relationships between discrete structures and their data structure counterparts including algorithm development.

COURSE CONTENTS:

Graph Theory: Graph- Directed and undirected Eulerian chains and cycles, Hamiltonian chains and cycles Trees, Chromatic number Connectivity and other graphical parameter. Application. [20%]

Combinatorial Mathematics: Basic counting principles Permutations and combinations Inclusion and Exclusion Principle Recurrence relations, Generating Function, Application. [15%]

Sets and functions: Sets and relations functions operations equivalence relations relation of partial order partitions binary relations. [15%]

Monoids and groups: Groups Semigroups and monoids Cyclic semigraphs and submonoids, Subgroups and Cosets. Congruence relations on semigroups. Morphisms. Normal subgroups. Structure of Cyclic groups permutation groups, dihedral groups Elementary applications in coding theory. [20%]

Rings and Boolean algebra : Rings Subrings morphism of rings ideals and quotient rings. Euclidean domains Integral domains and fields Boolean Algebra direct product morphisms Boolean sub-algebra Boolean Rings Application of Boolean algebra in logic circuits and switching functions. [30%]

TEXT BOOKS:

1. Discrete Mathematics (Schaum series) by Lipschutz (Mc Graw Hill)
2. Applied Discrete Structures for Computer Science by Alan Doerr and Kenneth Levarseur.

REFERENCES:

1. Discrete Mathematics by N Ch S n Lyengar, VM Chandrasekaran

CS-206 DATA COMMUNICATION

L	T	P
3	1	-

PREREQUISTES: None

OBJECTIVES:

This course provides knowledge about various types of Network, Network Topologies , protocols .

COURSE CONTENTS:

Introduction: Uses of Computer Networks, Network Hardware, Network Software, seven-layer OSI architecture of ISO, concepts of layer protocols and layer interfaces, TCP/IP reference model, comparison of OSI &TCP/IP reference models[20%]

Physical Layer: Transmission media , telephone system (structure, trunks , multiplexing and switching), wireless transmission , [15%]

Data Link Layer: Design Issues, Error detection and correction , elementary data link protocols , sliding window protocols.[20%]

Medium Access Sub layer: The channel allocation , IEEE standards 802 for LAN & MAN.

Network Layer: Design issues , routing algorithms, Congestion control Algorithims, IP protocol , IP addresses, Sub nets.[15%]

Transport Layer: Treansport Services, Elements of Transport protocols, TCP service Model , protocol, Header.[10%]

Application Layer: Network security , DNS . E-mail , world wide web, multimedia.[10%]

TEXT BOOKS

1.Computer Networks by Andrew S. Tanenbaum, Prentice Hall of India

REFERENCES

1. Data Communication by Stallings
2. Data Communication by Miller

CS-208 MICROPROCESSORS AND ASSEMBLY LANGUAGE PROGRAMMING

L T P
3 1 -

PREREQUISITES : Digital Circuits and Logic Design

OBJECTIVES: The course is intended to give students good understanding of internal architectural details and functioning of microprocessors .

COURSE CONTENTS:

1.**Microprocessor Architecture(20%)**

Basic Computer Architecture using 8085 MP I/O, Memory & System buses ,Instruction execution sequence & Data Flow, Instruction cycle Concept of address,Bus, Data Bus Data & Control Bus
Synchronous & Asynchronous buses.

2. **I/O memory interface(20%)**

Programmable , interrupted initiated ,DMA transfer serial & Parallel interface,Detail study of 8251 I/O Processor.

3. **Instruction set & Assembly Languages Programming (30%)**

Introduction, instruction & data formats, addressing modes, status flags, all 8085 instructions, Data transfer groups, Arthimetic group, Logical group, Branch Group.

4. Microprocessor Development System(MDS)(10%)

PROM Programming ,Emilator, ROM Simulation introduction to up kits, Study of 8051, Csingle chip microcomputer.

5.**Case structure & Microprocessor application(15%)**

Up application interfacing a matrix keyboard 7- segment led display
Study of trafic light system stepper motor interface

6. **Basic arcitect (5%)**

Introduction to 8086, motorola 68000

TEXT BOOKS:

1. 8085 Microprocessor by Ramesh Gaonkar,
2. Microprocessor by B.Ram

REFERENCES:

1. Daniel Tabak, Advanced Microprocessors, McGraw- Hill, Inc., Second Edition 1995.
2. Douglas V. Hall, Microprocessors and Interfacing: Programming and Hardware, Tata McGraw Hill Edition, 1986.
3. Charles M.Gilmore, Microprocessors: principles and Applications, McGraw Hill

CS - 210 SYSTEM PROGRAMMING

L T P

3 1 -

PREREQUISITES: One high level procedural language, knowledge to assembly language and knowledge of data structures and computer organization.

OBJECTIVES: This course provides knowledge to design various system programs.

COURSE CONTENTS:

Editors [5%]

1. Line editor, Full screen editor and multi window editor.
2. Case study MS-Word, DOS Editor and vi editor.

Assemblers [20%]

1. First pass and second pass of assembler and their algorithms.
2. Assemblers for CISC Machines: case study x85 & x86 machines.

Compilers [30%]

1. Introduction to various translators.
2. Various phases of compiler.
3. Introduction to Grammars and finite automata.
4. Bootstrapping for compilers.
5. Lexical Analysis and syntax analysis.
6. Intermediate Code Generation.
7. Code optimization techniques.
8. Code generation
9. Case study :LEXX and YACC.
10. Design of a compiler in C++ as Prototype.

Debuggers[5%]

1. Introduction to various debugging techniques.
2. Case study :- Debugging in Turbo C++ IDE.

Linkers and Loaders [10%]

1. Concept of linking.
2. Case study of Linker in x86 machines.
3. Loading of various loading schemes.

Operating System[30%]

1. Booting techniques and sub-routines.
2. Design of kernel and various management for OS.
3. Design of Shell and other utilities.

TEXT BOOKS:

1. Donovan J.J., Systems Programming , New York, Mc-Graw Hill, 1972.
2. Dhamdhere, D.M., Introduction to Systems Software, Tata Mc-Graw Hill 1996.

REFERENCES:

1.Aho A.V. and J.D. Ullman Principles of compiler Design Addison Wesley/ Narosa 1985.

CS - 212 SOFTWARE LAB – III (Operating System)

L T P

- - 2

1. Study and Implementation of various commands :

   Ls, man, pwd, cd, cat, mkdir, rmdir, chmod, cp, rm, mv, file, wc, cmp, cal, who, wild cards.

2. Implementation of shell programming with various control statements and loops.

CS - 214 HARDWARE LAB – II (Data Communication)

L T P

- - 2

1. Familiarization with Computer Hardware
2. Introduction with Network Computing
3. Client Server Architecture
   Peer to Peer Networking
   Hybrid Networking
   Direct Cable Connection
4. Study of LAN (Its installation)its Components and its Topologies.
5. Familiarization with transmission media viz. coaxial cable, twisted pairs, optical fibre networking, wireless networking, connectors etc.
6. Configuring Network Neighborhood.
7. Implementation of Protocols and their configuration..
8. Sharing of resources with two connected nodes.

CS - 216 HARDWARE LAB - III

(Microprocessor and Assembly Language Programming)

L T P

- - 2

1.Introduction to 8085 kit.
2. Addition of 2-8 bit number, sum 8- bit
3. Addition of 2-8 bit number, sum 16- bit
4. Subtraction of 2-8 bit number.
5 a) Find 1s complement of 8 bit number.
b) Find 1s complement of 16 bit number.
6. a) Find 2s complement of 8 bit number.
b) Find 2s complement of 16 bit number.
7. a) Shift an 8 -bit no. by one bit.
b) Shift an 16 -bit no. by one bit.
8. Find Largest ot two 8 bit numbers.
9. Find Largest among an array of ten numbers(8-bit).
10. Sum of series of 8 bit numbers.

CS - 218 SOFTWARE LAB - III (SP)

L T P

- - 4

Development of an integrated assembler macro processor direct linking loader module for a subject of assembly language and macro instructions of typical machine.

Study of direct linking loader module for a subset of assembly language and macro instructions of a typical machine. Software lab on I/O Programming, e.g. interfacing some device to a Intel 8085 microprocessor based systems through serial and parallel ports. Software lab for development of some features of editors Software lab for lexical analyzing using LEX/YACC, if available .

CS - 301 SYSTEM ANALYSIS AND DESIGN

L T P

3 1 -

PREREQUISTES: None

OBJECTIVES:

The course has been designed to provide a solid foundation of systems principles and an understanding of how business function, while heightening students to the issues analysts face daily.

COURSE CONTENTS:

1.Introduction [L-2]

System definition and concepts: Characteristics and types of system, Manual and automated systems

Real-life Business sub-systems: Production, Marketing, Personal, Material, Finance

Systems models types of models: Systems environment and boundaries, Real-time and distributed systems, Basic principles of successful systems

2. Systems analyst [L-1]

Role and need of systems analyst ,Qualifications and responsibilities ,Systems Analyst as and agent of change,

3. System Development cycle [L-3]

Introduction to systems development life cycle (SDLC) :

Various phases of development : Analysis, Design, Development,

Implementation, Maintenance

Systems documentation considerations: Principles of systems documentation , Types of documentation and their importance,Enforcing documentation discipline in an organization .

4. System Planning [L-5]

Data and fact gathering techniques: Interviews, Group communication, Presentations, Site visits.

Feasibility study and its importance

Types of feasibility reports

System

Selection plan and proposal

Prototyping

Cost-Benefit and analysis: Tools and techniques

5. Systems Design and modeling [L-8]

Process modeling, Logical and physical design, Design representation, Systems flowcharts and structured charts , Data flow diagrams , Common diagramming conventions and guidelines using DFD and ERD diagrams. Data Modeling and systems analysis , Designing the internals: Program and Process design ,Designing Distributed Systems .

6. Input and Output [L-2]

Classification of forms: Input/output forms design, User-interface design, Graphical interfaces

7. Modular and structured design [L-5]

Module specifications ,Module coupling and cohesion , Top-down and bottom-up design .

8. System Implementation and Maintenance [L-2]

Planning considerations, Conversion methods, producers and controls, System acceptance Criteria, System evaluation and performance, Testing and validation, Systems qualify Control and assurance, Maintenance activities and issues.

9. System Audit and Security [L-2]

Computer system as an expensive resource: Data and Strong media

Procedures and norms for utilization of computer equipment, Audit of computer system usage, Audit trails,

Types of threats to computer system and control measures: Threat to computer system and control measures, Disaster recovery and contingency planning

10. Object Oriented Analysis and design [L-6]
Introduction to Object Oriented Analysis and design life cycle, object modeling: Class Diagrams, Dynamic modeling: state diagram, Dynamic modeling:
sequence diagramming.

11. **Case study of the following systems [L-5]**

(I) Inventory Control

(II) Railway Reservation System

(III) University Management System

(IV) Hospital management System

TEXTS BOOKS

1. System analysis and design - Elias M.Awad.

REFERENCES

1. System analysis and design –Perry Edwards

2. Analysis and design of information systems – James A.Senn

CS-303 COMPUTER NETWORKS

L	T	P
3	1	-

I) **INTRODUCTION:**

Basic concepts of analog and digital signals, data transmission concepts, Analog and digital data transmission, transmission impairments.

(L-6)

II) **TRANSMISSION MEDIA:**

Guided and Un-guided media, Performance, Shannon Capacity. Media Computerisation.

(L-5)

III) **ENCODING AND MODULATING** :

Digital-to-Digital conversion, Analog and digital conversion, Digital to Analog conversion, Analog to Analog conversion.

(L-6)

IV) **DIGITAL DATA COMMUNICATION:**

Digital data transmission, DTE – DCE Interface, EIA-449, EIA-530, X.21, Modems, Cable Modems.

(L-6)

V) **MULTIPLEXING AND SWITCHING:**

FDM, WDM, TDM, Multiplexing application – telephone systems, DSL, Par Circuit switching Packet Switching & Message switching virtual circuits.

(L-6)

VI) SPREAD SPECTRUM:

Concept, Frequency hoping spread spectrum, direct sequence spread spectrum, code-division Multiple Access.

(L-4)

VII) ERROR DETECTION AND CORRECTION:

Types of Errors, Detection, VRC, LRC, CRC, Checksum, Error Correction.

(L-4)

VIII) PROTOCOL ARCHITECTURE:

Protocols, standards, …… OSI, TCP/IP Protocol Architecture.

(L-5)

Text Books :

1. "Data Communications and Networking" – Behrouz A Ferouzan – 2nd Edition, TATA McGraw Hill.
2. "Data and Computer Communication" – William Stallings – 7th Edition, Pearson Education.

References:

1. "Data Communication and Distributed Networks" – Ulylers D Black – 3rd Edition PHI.
2. "Computer Networks" – Andrew S. Tanenbaum, PHI

CS– 305 DATABASE MANAGEMENT SYSTEMS

L	T	P
3	1	-

PREREQUISITES: Data Structure

OBJECTIVES : To learn how to use a DBMS and how to build a DBMS.

COURSE CONTENTS:

Part – 1 Basic Concepts

Databases And Database Users: -
Introduction, Characteristics of Database Approach, Advantages And Disadvantages of Using DBMS. (L-2)

Database System Concepts And Architecture:-
Data Models, Schemas And Instances, DBMS Architecture And Data Independence, Database Language And Interfaces, Classification of Database Management Systems. (L-3)

Data Modeling Using The Entity Relationship Model:-
Entity Types, Entity Sets, Attributes And Keys, Relationships, Relationship Types, Roles, And Structural Constrains, Weak Entity Types, ER Diagrams, Naming Conventions And Design Issues. (L-4)

Part – 2 Relational Model, Language And Systems

The Relational Data Model, Relational Constrains, The Relational Algebra and Relational Calculus:-
Relational Model Concepts, Relational Constraints And Relational Database Schema, Update Operations And Dealing With Constraint Violations, Basic Relational Algebra Operations, Example of Queries in Relational Algebra, The Tupple Relational Calculus, The Domain Relational Calculus. (L-6)

SQL Relational Database Standard:-
Basic queries in SQL, More Complex SQL Queries, Insert, Delete and Update Statements in SQL, Views in SQL, Additional Features of SQL. (L-6)

Part – 3 Database Design Theory and Methodology

Functional Dependencies and Normalization for Relational Databases:-

Informal Design Guidelines for Relation Schemas, Functional Dependencies, Normal Forms Based on Primary Keys, General Definitions of Second and Third Normal Forms. (L-4)

Part – 4 System Implementation Techniques

Transaction Processing Concepts:-

Introduction to Transaction Processing, Transaction and System Concepts, Desirable Properties of Transactions, Schedules and Recoverability, Serializability of Schedules. (L-3)

Concurrency Control Techniques:-

Locking Techniques for Concurrency Control, Concurrency Control Based on Timestamp Ordering, Validation Concurrency Control Techniques, Granularity of Data Items and Multiple Granularity Locking. (L-3)

Database Recovery Techniques:-

Recovery Concepts, Recovery Techniques Based on Deferred Update, Recovery Techniques Based on Immediate Update, Shadow Paging. (L-4)

Database Security and Authorization:-

Introduction to Database Security Issues, Discretionary Access Control Based on Granting/Revoking of Privileges, Introduction to Statistical Database Security. (L-3)

Text Books :

1. Fundamentals of Database Systems, Third Edition, by Elmasri/Navathe
2. Korth and Silberschatz Abraham, Database Concepts, McGraw Hall,1991
3. An introduction to Database Systems by C.J.Date.

References :

1. An introduction to Database Systems by Bipin C. Desai.

2. SQL,PL/SQL ,The programming language of oracle, Ivan Bayross BPB Publication.

CS - 307 DESIGN AND ANALYSIS OF ALGORITHMS

L T P

3 1 -

PREREQUISITES: Discrete Structures and Data Structures.

OBJECTIVES:

Date Structures are an integral part of algorithm design and Discrete Structures covers topics like graph theory.

COURSE CONTENTS: Models of computation. Algorithm analysis, order arithmetic, time and space complexities and average and worst case analysis, lower bounds. [L-8]

Algorithm design techniques: divide and conquer, search and traversals. Dynamic programming. Backtracking. Branch and bound. [L-16]

Sorting and searching algorithms, combinatorial algorithms, string processing algorithms. Algebraic algorithms, set algorithms. Hard problems and approximation algorithms. [L-12]

Problem classes P, NP, NP-hard and NP-complete, deterministic and non deterministic polynomial time algorithms., Approximation algorithms for some NP-complete problems.

[L-6]

TEXT BOOKS

1.V. Aho, J.E.Hopcroft, J.D. Ullman, design and Analysis of Algorithms, Addison Wesley, 1976.

2.Horowitz, S. Sahni, Fundamentals of Computer Algorithms, Galgotia Publishers, 1984.

REFERENCES:

1. D.E.Knuth, The Art of Computer Programming, Vols. 1 and 3, Addison Wesley, 1968,1975.

2. K.Mehlhorn, Data Structures and Algorithms, Vols. 1 and 2, Springer Verlag, 1984.

3. Purdom, Jr.and C. A. Brown, The Analyses of Algorithms, Holt Rinechart and Winston, 1985.

CS - 309 COMPUTER GRAPHICS

L T P

3 1 -

PREREQUISITES: Data Structures and Algorithms.

OBJECTIVES:

Understanding the fundamental graphical operations and the implementation on computer, Get a glimpse of recent advances in computer graphics, Understanding user interface issues that make the computer easy for the novice to use.

COURSE CONTENTS:

Introduction: What is Computer Graphics, Elements of a Graphics, Workstation, Graphics hardware, I/o devices, Display devices [L-4]

Basic Raster Graphics: Scan conversion [L-4]

Filling [L-2]

Clipping. [L-2]

Geometric Manipulation: Transformations [L-4]

Matrices, Homogeneous Co-ordinates. [L-6]

Elementary 3D Graphics: Plane projections, Vanishing points, Specification of a 3D view.

[L-6]

Visibility: Image and object precision, z- buffer algorithms, area based algorithms, floating horizon. [L-6]

Advanced Issues: [L-4]

A. Curves and surfaces: Parametric Representation, Bezier and B-Spline curves.

B. Rendering, raytracing, antialiasing, fractals, Gourard and Phong shading.

TEXT BOOKS:

1. Computer Graphics (Schaum Series) by Lipschutz (MC Graw Hill)
2. Hearn and P. Baker. Computer Graphics, Prentice Hall.
3. C.Graphics by Yashwant Kanetkar.

REFERENCES:

1. D.Rogers and J. Adams, Mathematical Elements for Computer Graphics, McGraw -Hill International Edition.
2. David F. Rogers, Procedural Elements for Computer Graphics, McGraw Hill Book Company.
3. Alan Watt and Mark Watt, Advanced Animation and Rendering Techniques, Addison-Wesley.
4. Young, X Window. System Programming, OSF/Motif Edition, Prentice Hall.

CS-311 COMPUTER PERIPHERALS AND INTERFACES

L	T	P
3	1	-

PREREQUISITES: Microprocessor and Assembly Language Programming.

OBJECTIVES:

To learn the functional details of various peripheral devices.

COURSE CONTENTS:

SYSTEM RESOURCES: Interrupt, DMA Channel, I/O Port Addresses and resolving and resolving the conflict of resources. I/O buses- ISA, EISA, Local bus, VESA Local bus, PCI bus, PCI Express, Accelerated graphics port bus.

(L-10)

IDE & SCSI Interfaces: IDE origin, IDE Interface ATA standards ATA1 to ATA7. ATA feature, ATA RAID and SCSI RAID, SCSI Cable and pin Connector pin outs SCSI V/s IDE Advantages and limitation.

(L-4)

Video Hardware : Video display technologies, DVI Digital signals for CRT Monitor, LCD Panels, Video adapter types, Integrated Video/ Motherboard chipset, Video RAM, Video driver and multiple Monitor, Graphic accelerators. Advanced 3D Technologies, TV Tuner and Video Capture upgrades troubleshooting Video Cards and Drivers.

(L-8)

I/O Interfaces: I/O Interfaces from USB and IEEE1394, I/O Interface from serial and Parallel to IEEE1394 and USB 961, Parallel to SCSI converter. Testing of serial and parallel port, USB Mouse/ Keyboard Interfaces.

(L-10)

Input/ Output Driver software aspects: Role of device driver DOS and UNIX/ LINUX device drivers.

(L-4)

Design & Integration of Peripheral devices to a computer system as a Case Study

(L-2)

Future Trends: Detailed Analysis of recent Progress in the Peripheral and Bus systems. Some aspects of cost Performance analysis while designing the system

(L-2)

Text/ Reference:

1. P. Pal Chandhari , “Computer Organization and design” Prentice Hall of India Pvt. Ltd, 1994.
2. Del Corso, H.Kirrman, JD Nicond “Microcomputer buses & links” Academic Press 1986.
3. Douglas V Hall “Microprocessor & Interfacing Programming & H/W” McGraw Hill International 2nd Edition 1992.
4. Scott Muller, “Upgrading and repairing PC”

CS– 313 Software Lab-IV (DATABASE MANAGEMENT SYSTEMS)

L	T	P
-	-	4

1. Introduction to DBMS.
2. To implement different types of DDL, DML and DCL statements in SQL.
3. To use constraints on the created database.
4. To explore 'select' clause using where, order by, between, like, group by, having etc.
5. To implement different in-built functions on the created database.
6. To implement nested and correlated queries.

CS - 315 HARDWARE LAB – IV

(Data Communication)

L T P

- - 2

1. Conversion of Analog to digital signals.
2. Conversion of digital to analog signals.
3. Conversion of Analog to Analog signals.
4. Conversion of digital to digital signals.
5. Implementation of multiplexers.
6. To study FDM modulation techniques.
7. To study TDM modulation techniques
8. To study WDM modulation techniques
9. To study various transmission media like twisted pairs, co-axial cables,optical fibers etc.

CS - 317 SOFTWARE LAB – V

(Algorithms)

L T P

- - 2

Experiments to plot growth of functions. Implementing heuristics and comparison with algorithms designed with asymptotic complexity in Comparison of various data structures for the same algorithm. Experiments with software packages like LEDA.

CS - 319 SOFTWARE LAB – VI

(Computer Graphics)

L T P

- - 2

Do two line segments intersect.

Compute the convex hull of a set of planar points.

Sean convert line segments.

Clip line segments against windows.

Fill polygon with stipple patterns.

Use Phigs to show objects in various views.

The truncated cube of Module 3 employed here.

Display the view volume.

Show a unit cube in perspective.

Implement the de Casteljau algorithm for curves.

Demonstrate the properties of the Bezier curves Run a sample session on Microsoft Windows including the use of Paintbrush.

CS-302 RELATIONAL DATA BASE MANAGEMENT SYSTEMS – II

(RDBMS-II)

L T P

3 1 -

PREREQUITIES: RDBMS-I

OBJECTIVES:

To learn how to use a RDBMS and how to build a RDBMS.

COURSE CONTENTS:

Data base system architecture, data independence, storage structures, data representation, indexing, relational data structure, relations, attributes, keys, embedded SQL, Relational Algebra, Query by example, relational calculus, normalization & normal forms, functional dependence, over view of security, integrity, recovery, backup, etc. [25 %]

SQL, Transact-SQL, PL SQL, SQL *PLUS, Managing Database and Queries: Creating, defining and modifying Table structure, Transact-SQL PLUS and substitution of variables. [35%]

Introduction to SQL Server and Oracle Server [5%]

Indexes [5%]

Views [5%]

Packages [5%]

Triggers And Stored Procedures [10%]

Cursors [5%]

Control structure [5%]

Text Books:

1.Korth and Silberschatz Abraham, Database System Concepts, McGraw Hall, 1991.

2. An Introduction to Database Systems, Vol.-1,C.J.Date (Addison Wesley)

References:

1. Ramez Elmasri and Shamkant B. Navathe Fundamentals of Database System, The Benjamin / Cummings Publishing Co., 2nd Edition, 1994.

2 .PL/SQL The Programming Language of ORACLE, Ivan Bayross (BPB Publication)

CS- 304 INTRODUCTION TO BUSINESS SYSTEMS

L	T	P
3	1	-

PREREQUISITIES : None
OBJECTIVES: To familiarize students with basics of data processing, COBOL and data management packages. It also introduces students to basics of Software Engineering.
COURSE CONTENTS:
Introduction to Business System: Data capture, Processing dissemination storage/retrieval I/O and storage devices terminals printers and disks. [20%]
Principles of Data Processing: Data representation and file management in COBOL Sequential indexed and relative files, User interfaces, report writer screen management. [30] %
Data Management Software: Packaged software: Word processors spread sheets, Data management packages such as DBASE and FOXPRO. [15 %]
Principles of Software Engineering: Software development methodology: System analysis, DFD, ER Model design concepts software architecture file (table) and process design issues in system implementation. Enterprise Resource Planning (ERP) management, Resource Planning (MRP-2) Software like SAP, MARCAN.[25 %]
Special topics Introduction to Management Information Systems and Decision Support Systems. [10 %]
TEXT BOOKS
1) N. L. Sarda, Structured COBOL Programming with Business application, Pitmbar Publishing Co., First edition 1990.
2) M. K. Roy and D. Ghosh Dastidar, COBOL Programming, Tata McGraw Hill 1985.
3) Foxpro by R.K.Taxali
REFERENCES
1)Computers today by Suresh
2) R.S. Pressman, Software Engineering, McGraw Hill Inc., Third Edition, 1992.

CS 306 Asynchronous Transfer Mode

L T P

3 1 -

PREREQUISTES: Data Communications or CN-I

OBJECTIVES: The course provides sufficient knowledge of theoretical and practical aspects of networks and their applications.

COURSE CONTENTS:

Introduction to ATM, ATM Cable & Transmission, Theory of Operation, Choice of Payload size [20%]

ATM N/W Basics, ATM Hardware, Switch Models and their comparison [20%]

ATM traffic Management, Conjunction control [25%]

User Control and Management Planes [5%]

ATM and System, Design Consideration [5%]

ATM based Protocol interworking, ATM layer Performance Measurement[15%]

Technological comparison of ATM with others structures [10%]

TEXT BOOKS

1) ATM - Theory and Application by David E. McDysan & Darren L. Spohn, Mc Graw Hill 1994

REFERENCES

1) IEEE Networks Magazine Sep '92 onwards

CS-308 SOFTWARE ENGINEERING

L T P

3 1 -

PREREQUISITIES :

Computer fundamentals, Concepts of structures programming, Programming in atleast on high level language, Elementary data structures, Elementary probability theory, Business Information system and Database Management System.

OBJECTIVES :

The course should provide an introduction to the fundamentals principles of software engineering. The present course should seek to equip the student with a repertoire of principles, tools and techniques and make him/her appreciate that software engineering is, after all, an exercise in making compromises.

COURSE CONTENTS

Software Engineering Principles: How is software engineering an engineering discipline, Information system characteristics, software development process models, life cycle concepts, software phases and deliverables, software development strategies. [15 %]

Technical Development: Structured systems analysis and design requirements collection and specification, data flow and logical data modeling, cost benefit analysis, feasibility study, architectural and detailed design, process, data, network, control and user interface designs, physical data design, dynamic modeling for real-time systems. [15 %]

Software Project Management: principles of software project management organizational and team structure, project planning, project initiation and project termination; technical, quality and management plans, project controls, cost estimation methods-function points and COCOMO, tools. [15 %]

Software Quality Management: quality control, quality assurance, quality standards, software metrics, verification and validation, testing, quality plans, tools Configuration Management [15 %]

Software Development Method & CASE: formal, semi-formal and informal methods; data function, and event-based modeling, some of the popular methodologies such as Yourdon's SAD, SSADM etc. CASE tools, CASE standards.[20 %]

Implementation: in 3GL environment, in 4GL environment, in client-server environments, coding styles. [20 %] Documentation, Software Maintenance [5 %]

TEXT BOOKS:

1) Pressman R. S., Software Engineering: A practitioner's Approach, Third Edition McGraw Hill, New York, 1987.

2) Jalota,Software Engineering.

3) Sommerville I., Software Engineering, Fourth Edition, Addison - Wesley Pub. Co., 1992.

REFERENCES:

1) Ghezzi C., Jazayeri M. And Mandrioli D.: Fundamentals of Software Engineering, Prentice Hall, N. J. 1991

2) Pfleedger S. L., Software Engineering: The Production of Quality software, Second Edition, Macmillan Publishing Company, 1991.

3) Oehm B. W., A Spiral Model of Software Development and Enhancement, IEEE Computer, 21.pp 61-72, May 1988.

4) Fairley R., Software Engineering Concepts, McGraw Hill, New York, 1985.

CS – 310 COMPUTER VISION (ELECTIVE-I)

L T P

3 1 -

PREREQUISITES: Maths, Basic Image Processing Techniques

OBJECTIVES:

To familiarise students with principles, algorithms and systems in Computer Vision with a view to make them aware of principal applications.

COURSE CONTENTS :

Applications of Computer vision :

a)Machine vision for industrial inspection

b)Machine vision for Robotics and control

c)Image analysis of industrial and medical images Early visual processing, Review of basic image processing techniques. [10%]

Intermediate Processing: Computational approach to stereopsis, Distance and surface orientation computation from Disparity, Visual motion computation, apparent motion and correspondence Problem. [20%]

Architectural issues of intermediate processing, Parallel algorithms, Parallel solutions to conventional Image algorithms, Pyramidal architecture for vision. Fuzzy logic procedures in computer vision algorithm, Fuzzy logic procedures in computer vision algorithm, Fuzzy logic membership function, application in decision making . [20%]

Shape Representation & Recognition: Critical Issues, the 3D model representation, their derivatives and use, Relation between viewer centred and object centred representation, Correspondence between Image and Catalogued model. [30%]

Peripheral hardware for computer vision: Imaging devices, frame grabbers, display devices. [20%]

TEXTS/REFERENCES:

1)Ballard and C.M.Brown, Computer Vision , Prentice Hall, Englewood Cliffs, 1982

2)Horn, Robot Vision, MIT Press, Combridge, 1986

3)MJB Duff, Intermediate level Image processing, Academic Press, 1986

4)E.R.Davies; Machine vision Theory, Algorithms & Practicalities, Acadmic Press, 1990

5)David Vernon, Machine vision, Academic Press 6)Pratt; Digital Image Processing John Wiley & Sons, 1978

CS – 322 SYSTEM HARDWARE DESIGN (ELECTIVE I)

L T P

3 1 -

PREREQUISITES: Basic Electrical Circuits (R.L.C. circuit analysis), Basic Electronic Devices and Circuits (B.J.I.s MOSFETs, basic logic gates)

OBJECTIVES:

To provide students an exposure to analysis and design techniques used in digital system hardware design.

COURSE CONTENTS:

CMOS Technology :

Logic levels noise margin power dissipation, supply currents speed, delays. [10%]

Interconnect analysis Power/Ground droop/ bounce coupling analysis Transmission line effects/cross talk [40%]

power/ground distribution signal distribution Logic Design \ Random logic \ Programmable logic Microcontrollers Memory subsystem design Noise tolerant design worst case timing thermal issues in design. [40%]

Real life system design examples. [10%]

TEXTS/REFERENCES:

1)James E.Buchanan, " BICMOS-CMOS System Design" McGraw Hill International Edition 1991.

2)Jame E.Burchnana, " CMOS-TTL System Design" Mc Graw Hill International Edition 1990

3)John P. Hayes. " Digital System Design and Microprocessors" Mc Graw Hill International Edition 1985.

4)Darryl Lindsay, " Digital PCB design and drafting" Bishop Graphics 1986.

5)Howard W.Johnson & Martin Graham, High Speed Digital Design-A Handbook of Black Magic, Prentice Hall, PTR Englewood Cliffs, 1993

CS – 324 REAL TIME SYSTEMS (ELECTIVE I)

L T P

3 1 -

PREREQUISITES : Computer Organisation and Operating System.

OBJECTIVES:

To give an insight of concepts underlying, Real Time Systems and knowledge based real time systems, to give an understanding of its design and implementation.

COURSE CONTENTS:

Introduction to Real-time Systems: Issues of Real- time systems, tasks & Task parameters, Real-time Systems components Soft and hard real time system , periodic and aperiodic tasks. Specification of time constraints. [10%]

Need for tasks scheduling: issues and scheduling methodologies. Priority based scheduler, value based scheduler & Pre-emptive scheduling multiprocessor environment. Deterministic scheduling, Hardware Schedulers. [25%]

Real time Operating Systems: A case study of generalized Executive for multiprocessors(GEM). Programming using Real time OS Constructors. Microprocessors based Real time scheduler. [20%]

Real Time languages: Case study of a language having facilities for time and task management Euclid and Ada for real time programming. [10%]

Architectural requirements for Real Time Systems Tightly coupled systems, hierarchical systems, arbitration schemes, Reliability issues, HW/SW faults, diagnosis, functional testing etc. Fault tolerant architectures: TMR systems. [10%]

Real time knowledge based systems: Integration of real time and knowledge based systems. Neural networks and fuzzy logic in real time systems. [25%]

TEXTS/REFERENCES:

1)Levi S.T. and Agarwal A.K. Real time System Design, McGraw Hill International Edition, 1990.

2)Stankovic J.A. and Ramamritham K. , Hard real time systems, IEEE Press, 1988.

CS – 326 OPERATION RESEARCH

L T P

3 1 -

PREREQUISITES: Mathematics

OBJECTIVES:

Importance of need to take intelligent decisions is to be emphasized. Using OR major focus should be on how to model various situations in industries and solve them.

COURSE CONTENTS:

Introduction to OR modeling approach and various real life situations. [5%]

Linear programming problems & Applications, Various components of LP problem formulation. Solving Linear Programming problem using simultaneous equations and Graphical Method Simplex method & extensions :

Sensitivity analysis

Duality theory Revised

Simplex Dual Simplex

Transportation and Assignment Problems. [30%]

Network Analysis including PERT-CPM Concepts of network the shortest path minimum spanning tree problem maximum flow problem minimum cost flow problems The network simplex method Project planning & control with PERT & CPM [20%]

Integer programming concepts, formulation solution and applications [10%]

Game Theory [10%]

Queuing Theory & Applications [10%]

Linear Goal Programming methods and applications [5%]

Simulation [10%]

TEXT BOOKS:

1. Operation Research by D.S Hira.
2. Operation Research by D.S Sharma.

REFERENCES:

1) F.S Hillier & G.J. Lieberman, Introduction to OR, Mcgraw hill Int. Series 1995

2) A Ravindran, Introduction to OR. John Wiley & Sons, 1993

3) R.Kapoor, Computer Assisted Decision Models, Tata Mcgraw Hill 1991

CS – 328 LANGUAGE PROCESSORS (ELECTIVE I)

L T P

3 1 -

PREREQUISITES: Formal Language & Automata Theory, Systems Programming

OBJECTIVES: Understand the influence of programming languages and architectures on the efficiency of language translation.

COURSE CONTENTS:

Overview of the translation process, Lexical analysis:

Hand coding and automatic generation of lexical analysers. [8%]

Parsing theory: Top down and bottom up parsing algorithms. Automatic generation of parsers [8%]

Error recovery: Error detection & recovery. Ad-hoc and systematic methods. [18%]

Intermediate code generation: Different intermediate forms. Syntax directed translation mechanisms and attributed definition [7%] Run time memory management: Static memory allocation and stack based memory allocation schemes. [17%]

Symbol table management. [8%]

Code generation: machine model, order of evaluation, register allocation and code selection. [17%]

Code Optimization: Global data flow analysis. A few selected optimizations like command sub expression removal, loop invariant code motion, strength reduction etc. [17%]

TEXTS/REFERENCES:

1)Aho, Ravi Sethi, J.D. Ullman, Complilers tools and Techniques, Addison-Wesley, 1987

2)Dhamdhere, Compiler Construction- Principles and Practice Macmillan, India 1981

3)Tremblay J.P. and Sorenson, P.G. the Theory and practice of Compiler writing ' Mcgraw Hill, 1984

4)Waite W.N. and Goos G.Compiler Construction Springer Verlag, 1983.

CS-330 NATURAL LANGUAGE PROCESSING (ELECTIVE I)

L T P

3 1 -

PREREQUISITES: Basic course on artificial intelligence, Data Structure & Algorithms.

OBJECTIVES:

Introduction to the methods and techniques of Natural Processing- semantics, pragmatics, Applications of Natural Language Processing.

COURSE CONTENTS:

Components of natural language processing: lexicography, syntax, semantics, pragmatics: word level representation of natural languages prosoty & natural languages. [20 %]

Formal languages and grammars: Shomsky Hierarchy; Left Associative Grammars. Ambiguous Grammars. Resolution of Ambiguities. [20%]

Semantics knowledge Representation: Semantic Network Logic and inference. Pragmatics, Graph Models and Optimization. Prolog for natural semantic. [20%]

Computation Linguistics: Recognition and parsing of natural language structures: ATN & RTN; General techniques of parsing: CKY, Earley & Tomita's Algorithm. [20%]

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. [20%]

TEXTS BOOKS

1) J.Allen, Natural Language understanding, Benjamin/Cunnings, 1987.

2) G.Gazder, Natual Language processing in Prolog , Addison Wesley, 1989.

REFERENCES:-

1) Mdlj Arbib & Kfaury, Introduction to formal language Theory, Springer Verlag 1988.

CS - 312 COMPUTERS AND SOCIETY

(Open Elective for other branches)

L T P

3 1 -

PREREQUISITES : RDBMS-I & Computer Networks-I.

OBJECTIVES:

To study the impact of the large scale introduction of computers on the cultural social and political environment of a country.

To discuss ethical and moral issues of concern to computer scientists and engineers.

COURSE CONTENTS:

A survey of a variety of computer application. [15%]

Impact of introduction of computers and its impact on privacy and security [15%]

Networking of computers and its impact on privacy and security [15%]

Information integrity [10%]

Ethical issues arising out of creation of computer viruses trojan horses etc. [10%]

Intellectual property rights in relation to computer v hardware and software.[15%]

Data banks and their impact on society. [10%]

The role of computer in education. [10%]

TEXTS / REFERENCES:

Weizenbaum, J. Computer Power and Human Reason: from judgement to Calculation. W. H. Freeman, San Francisco, 1976.

Dunlop, C., Kling , R., (Editors) Computerization and Controversy: Value Conflicts and Social Choices, Boston Academic Press, 1991

CS 314 HARDWARE LAB - V (ATM)

L T P

- - 4

Simulation of ATM Switch performance, through put with mixed load conditions.

Implementing Ethernet on various plateform (Windows NT, Window 95, UNIX, Mac OS Novell Netware)

· Installation of windows NT & Novell Netware

· Comparison of Network traffic

· Handling problems related to congestion using various tools (Net watcher etc.)

· Comparison of utilization of various resources (Processor, memory, hard disk etc.)

· Under different networking loads.

· Familiarization with NDS in Novell.

· Memory Management Techniques in N/W

· Data compression & its Effects on N/W

· Security Aspects of N/W System efficiency

· Creation & maintenance user Accounts

· Permit Spooling

CS- 316 SOFTWARE LAB - VII (RDBMS-II)

L T P

- - 4

To run the various queries using commands of SQL.

To write programs using control structures of PL/SQL like

If-else statements.

To write programs using loops of PL/SQL like

For

Do-while

while

Implementation of

Cursors.

Procedures

Packages.

Triggers

CS- 318 SOFTWARE LAB - VIII

(S/W ENGINEERING)

L T P

- - 2

Assignments should be provided for the following:

· Use of CASE tools for development of DFD, data dictionary, E-R diagram, Structured Chart.

· Analysis and design of simple object-oriented as well as real time systems.

· Familiarity with JSP and JSD

· Documentation

· Beta Testing

CS 320 SOFTWARE LAB - IX

(BUSINESS SYSTEM)

L T P

- - 2

· Laboratory exercises covering usage of COBOL for handling indexed sequential and relative files.

.COBOL screen management report management and report writing facilities.

· Lab Experiments on data management packaged like DBASE, FoxPro.

.Usage of Word processor.

EIGHTH SEMESTER

CS 402 SYMBOLIC LOGIC & LOGIC PROGRAMMING

L T P

3 1 -

PREREQUISITIES: Discrete Structures.
OBJECTIVES: Representation of world knowledge using symbolic logic, Deductive strategies employed in symbolic logic and Programming in Prolog.
COURSE CONTENTS:
Prepositional logic: syntax and semantics: Validity and consequence. Normal forms. Representing world knowledge using prepositional logic. [15 %]
First order logic: World knowledge representation and the need for quantifiers. Syntax, semantics validity consequence clause normal from. [20 %]
Introduction to prolog: Syntax of prolog, Structured data representation. Execution model Introduction to Programming in Prolog, Illustrative examples. [20 %]
The connection between logic and logic programming interpreting logic programs in terms of Horn clauses Deduction from clause form formulas resolution for prepositional logic Ground resolution. Unification and first order resolution SLD resolution; the computation and search rules. SLD trees and interpretation of non-declarative features of Prolog.[20 %]
Advanced prolog features: programming techniques: Structural Induction and Recursion, Extra Logical features: Cut and Negation Case studies.[20 %]
Introduction to Fuzzy logic neural networks [15 %]
TEXT BOOKS
1) Stoll, set Theory and logic, Dover publishers, New York, 1963.
2) Clocksin, W.F. and Mellish, C.S., Programming in Prolog 2nd edition, Springer - Verlag, 1984

REFERENCES
1) Gries, The Science of Programming, Narosa Publishers, 1985
2) O' Keefe, R., The Craft of Prolog. The MIT Press, 1991.
3) Lloyd, J. W., Foundation of Logic Programming, Springer, 1984.

CS 404 FORMAL LANGUAGE & AUTOMATA THEORY

L T P

3 1 -

PREREQUISITIES: Data Structure and Programming Methodology

OBJECTIVES: To give the students a knowledge of number of areas in theoretical computer science and their hierarchical interconnections.

COURSE CONTENTS:

Basic Definitions Operations on Languages: Closure properties of Language Classes. Context Free languages: The Chomsky Griebach Normal Forms. Linear Grammars and regular Languages. Regular Expressions Context Sensitive Language; The Kuroda Normal Form, One sided Context Sensitive Grammars. [35 %]

Unrestricted Languages: Normal form and Derivation Graph, Automata and their Languages: Finite Pushdown 2-push down Automata and Turing Machines. The Equivalence of the Automata and the appropriate grammars. The Dyck Language. [25 %]

Syntax Analysis : Ambiguity and the formal power Series, Formal Properties of LL(k) and LR(k) Grammars. [15 %]

Derivation Languages; Rewriting Systems, Algebraic properties, Canonical Derivations, Context Sensitivity.[15 %]

Cellular Automata : Formal Language aspects, Algebraic Properties Universality & Complexity Variants. [10 %]

TEXT BOOKS

1) G. E. Reevsz, Introduction to Formal Languages, McGraw Hill 1983

2) M. H. Harrison, Formal Language Theory Addison Wesley 1978.

REFERENCES

1) Wolfman Theory and Applications of Cellular Automata, World Scientists, Singapore, 1986.

CS 408 PRINCIPLES OF ENGINEERING ECONOMICS & MANAGEMENT TECHNIQUES

L T P

3 1 -

PREREQUISTES: None

OBJECTIVES : The students should understand cost estimate of projects - Depreciation Methods, Investment alternative - Human Resource Management Technical for optional utilization of men, modines material & Money.

COURSE CONTENTS

Cost analysis: Break-even analysis, two and three alternatives, graphical solution. Break-even charts, effects of changes in fixed and variable costs. Minimum cost analysis, economics order quality. Effect of risk and uncertainty on lot size.[10 %]

Replacement Studies: Reasons for replacement, factors to be considered in replacement Studies, discounted cash flow analysis, economic life of a project, challenger and defender [10 %]

Economic Analysis Of Investment Alternatives : Basic economy study patterns and their comparison, decision making in selection of alternative by present worth methods, rate of return method, payout period method and uniform annual cost method, economic analysis of new projects, effect of taxation on economic studies.[10 %]

Cost Estimation : Difference between cost estimation and cost accounting, qualifications of an estimator. Estimating procedure, Estimate of material cost and labour cost. Estimation of cost in various manufacturing operations. [10 %]

Depreciation : Types of depreciation and their Methods. [5 %]

Human Resource Management :Introduction to Human Resource Management and its definition, Functions of Human Resource Management & its relation to other managerial. Importance of Human Resource in Industry.[10 %]

Procurement And Placement : Need for Human Resource Planning process of Human Resource Planning, Method of Recruitment, Psychological tests and interviewing, Meaning and Importance of placement and Induction. [15 %]

Training & Development : Difference between Training and Development, Principles of Training, Employee Development, Promotion merit V/S seniority performance appraisal [10 %]

Job Satisfaction : Job satisfaction and its importance, Motivation Factor affecting motivation, Introduction of motivation Theory, workers participation, Quality of working like. [10 %]

Integration & Maintenance: Introduction to Integration and Maintenance. [5 %]

TEXT BOOKS

1. Drawin B. Flippo Principles of personnel Management (MC Graw Hill)

2. Michael J. Jucius Personnel Management (Richard D. Inwin, Homewood)

3. R.C.Saxena Labour Problems and Social Welfare (K. Math & Co. Meerut)

4. T.N. Bhagooiwal Economics of Labour and Industrial Relations (Sahitya Bhawan Agra)

5. Engineering Economy : Thuesen Pnentice Hall

REFERENCES

1. A. Minappa and Personnel Managements M.S. Saiyada (Tata Mc Graw Hill)

2. C.B. Mamoria Personnel Management (Himalaya publishing house Bombay)

3. Engg. Economics Analysis Bullinger

4. Introduction to Econometrics : Kliwen Prentice Hall

CE-216 ENVIRONMENTAL SCIENCE

L T P
3 1 0

Unit 1 : The Multidisciplinary nature of environmental studies

Definition, scope and importance

(2 Lectures)

Need for public awareness.

Unit 2 : Natural Resources :

Renewable and non-renewable resources :

Natural resources and associated problems.

a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
b) Water resources : Use and over-Utilization of surface and ground water, floods, drought, conflicts and water, dams-benefits and problems.
c) Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
d) Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
f) Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Unit 3 : Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystem :-

  a. Forest ecosystem
  b. Grassland ecosystem
  c. Desert ecosystem
  d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lectures)

Unit 4 : Biodiversity and its conservation

- Introduction – Definition : genetic, species and ecosystem diversity.
- Biogeographical classification of India
- Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation
- Hot-spots of biodiversity.
- Threats to biodiversity : habitat loass, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity : In-situ conservation of biodiversity.

Unit 5 : Environmental Pollution

Definition

- Causes, effects and control measures of :-
  a. Air pollution
  b. Water pollution
  c. Soil pollution
  d. Marine pollution
  e. Noise pollution
  f. Thermal pollution
  g. Nuclear hazards

- Solid waste Management : Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management : floods, earthquake, cyclone and landslides.

(8 lectures)

Unit 6 : Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rahabilitation of people ; its problems and concerns. Case studies.
- Environmental ethics : Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.

- Consumerism and waste products.
- Environment Protection Act.
- Air (Preventation and Control of Pollution) Act.
- Water (Prevention and control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation.
- Public awareness.

(7 lectures)

Unit 7 : Human Population and the Environment

- Population growth, variation among nations.
- Population explosion – Family Welfare Programme.
- Environment and human health.
- Human Rights.
- Value Education.
- HIV / AIDS
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

Unit 8 : Field work

- Visit to a local area to document environmental and river forest grassland hill mountain.
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds.
- Study of simple ecosystems-pond, river, hill slopes, etc. (Field work Equal to 5 lecture hours)

CS-410 ORGANISATIONAL STRUCTURES (ELECTIVE - II)

L T P

3 1 -

PREREQUISITIES : None

OBJECTIVES :

The major objectives of the course is to help students acquire an understanding of organization and the ways in which they are structured. It will also examine the influence of structure on the behavior of individuals and groups.

COURSE CONTENTS :

Understanding the nature of organizations [5 %]

A systems approach to organizations [10 %]

Explaining predicting Behaviors in Organizations. [5 %]

The individual in the organizations Organizational structure its dimensions, its influence [25%]

Taxonomy of organizations. Types of structure [15 %]

Forms of Organizational structure

Product process, functional, territorial and matrix, SBUs. [25 %]

Organizational Theory and Designs [15 %]

Departmental Elective - II

CS –416 OVERVIEW OF IT MATERIALS.

L T P

3 1 -

PREREQUITIES: Physics and Chemistry

OBJECTIVES : To familiarize with the structures, properties and their inter-relationship for different materials having electronic and magnetic applications.

COURSE CONTENTS :

Electrical and Thermal Properties of Metals: The electron gas model of an electron in an electric field., mobility and conductivity, factors affecting the conductivity of electrical materials, effect of temperature on electrical conductivity of metals, superconductivity[20 %]

Dielectric Properties of Materials : Polarization of dielectric constant of monatomic gases, other polarization methods, the internal fields in solids and liquids, the polarisability catastrophe Frequency dependence of polarisability dielectric losses, dipolar relaxation, frequency and temperature dependence of dielectric constant of polar dielectrics, ionic conductivity in insulators, insulating materials, Ferro-electricity, Piezo-electricity[20 %]

Magnetic Properties of Materials : Classification of magnetic materials; the origin of permanent magnetic dipoles, diamagnetism, Para magnetism, ferromagnetism, ferromagnetic domains, the magnetization curve, hystersis loop, magnetostriction magnetic materials, antiferromagnetism, Ferro-magnetism, magnetic resonance ferrites, their p0roperties and uses. [20 %]

Optoelectronic Materials: Photoemission, Photomassive materials and Photocathodes, Multialkali photocathodes, Electroluminiscence. Electroluminiscence panels, junction photoemitters, injection losses, gallium arsenide, gallium phosphide and other losing materials.[15 %]

Special Electrical and Electronic Materials: Alloys and compounds, Solid solution and solubility, phase diagram, alloy composition and properties, multi phase materials, ceramics preparation, Silicate Structure and polymorphism, Properties of ceramics, High temperature ceramics, Crystalline and amorphous phases, Amorphous and polycrystalline materials[15 %]

Engineering plastics : Polymer Structures : Preparation and characterization of plastics, clastomers and fibres; Application of polymers in electronics and optoelectronic device technology[10 %]

TEXT BOOKS

1. V. Rahhavan Material Science and Engg. A first course, Prentice Hall of India, 1988.

2. C.M. Srivastava and C. Srivastava, Science of Enggg. Materials, Wiley Eastern Ltd., 1987

3. Kenneth M. Ralls and Thomas H. Courtney and John Wulff, Introduction to Materials Science and Engg. , Wiley Eastern Ltd., 1975.

4. William D. Callister Jr. Materials Science and Engg. - An Introduction, John Wiley and Sons, Inc. N. Y. 1994.

REFERENCES

1. John Allison Electronic Engineering Materials and Devices, Tata McGraw Hill, 1981.

2. **J. Dekker., Electrical Engg. Materials, Prentice Hall of India. D.V. Morgan and K. Board, an Introdcuction to Semiconductor Microtechnology John Wiley and Sons Inc. N.Y. 1983.**

Departmental Elective - II

CS 418 SYSTEM SIMULATION & MODELLING

L T P

3 1 -

PREREQUISITIES : Programming Languages.

OBJECTIVES: The course provides an understanding of the various techniques of simulation.

COURSE CONTENTS:

Concept of a system, stochastic activities, continuous and discrete system, principals used in simulation and modeling for various applications. [10%]

Techniques of simulation, Monte Carlo method, type of system simulations, real time simulation stochastic variables, discrete probability function, generation of random number, poisson arrival pattern, exponential distribution, service time, normal distribution, queuing discipline, measures of queues.[30%]

Representation of time, generation of arrival pattern, Discrete simulation languages queuing and inventory control.[25%]

Discrete simulation languages an overview of use of GPSS as a simulation.[20%]

Inventory control systems for illustration of applications.[15%]

TEXTS BOOKS:

1. Gordon. G., system simulation, 2nd ed. 1989, Prentice Hall of India Pvt. Ltd.

2. Deo, Narsingh, system simulation with digital computers, PHI, New Delhi, 1993.

REFERENCES:

1. K.S. Trivedi, " Probability and statistics with reliability, quening and computer science application. P.H. is Engluood cliff.

2. Subranranian, K.R.V. and Sundaresan R. Kadayam, System simulation: Introduction to GPSS, CBS, New Delhi, 1993.

3. W. Feller, "An Introduction to probability theory and its applications," Vol 183, Wiely Eastern Ltd. ND.

Departmental Elective - II

CS –420 EMERGING TECHNOLOGIES AND CUREENT IT-TRENDS

L T P

3 1 -

PREREQUISITIES: Computer Networks And RDBMS

OBJECTIVES: To Provide Hands On Experience To The Students On Current It Trends & Emerging Technologies.

COURSE CONTENTS:

Introduction to DVD technology and its advantages over CD technology. [5 %]

Introduction to SNA Server fundamentals, SNA server network overview, Why SNA server and its connectivity with PC's [5 %]

Introduction to ISDN Services and alternatives to ISDN technology, Operating System software for ISDN, Connection of multiple devices to ISDN lines. [10 %]

MAPI and its open architecture, other messaging API's, cross platform API's, advantages and disadvantages of cross MAPI's, Windows Open Systems Architecture (WOSA). [10 %]

Evaluation of the performance of AS400 & TCP/IP connectivity in an AS400 environment, Integration of IBM mainframes with TCP/IP networks. [15 %]

Distributed computing environment (DCE), DCE services, Remote Procedure Call (RPC) & DCE security, Cell Directory Services (CDS), Global Directory Services. [10 %]

(GDS), Distributed to proxy server & SQL server, Internet & Online services, Internet security framework And its overview, Intranet concepts & related term development toolbox. [10 %]

Introduction to Open Database connectivity (ODBS), Object Linking Embedding [10 %]

Introduction to Telephone Application Programming Interface (TAPI) [10 %]

TEXTS BOOKS:

1. Reference Technical Information Network From Microsoft

CS-412 GRAPHICAL USER INTERFACE (DE-III)

L T P

3 1 -

PREREQUISITES: None.

OBJECTIVES: The course provides the knowledge about GUI concepts to help the students for developing projects.

COURSE CONTENTS:

GUI concepts and an introduction to MS Windows.[10%]

Understanding the components of a window [10%]

Hungarian naming and basic data types [15%]

An attempt to code the shortest windows program, Menus. [15%]

GDI-an introduction, Mouse messages, Key Board Messages [10%]

Windows, Edit controls [10%]

Windows within window - The child window, Accessories, Dialog boxes [10%]

Memory Management [10%]

Customized resources, Printing, Bitmaps and Clipboard. [10%]

TEXT BOOKS:

1.Window API Bible by Galgotia Publication.

2.Ben Ezzell with Jim Blaney, NT4/ Windows 95 Developer's Handbook, BPB Publications, 1997.

REFERENCES:

1. Charies Patzold, Programming Windows '95, Microsoft Press, 1996

2. Richard J. Simson, Windows NT Win32, API Super Bible SAMS,1997

Departmental Elective - III

CS-422 ADVANCED MOCROPROCESSOR (ELECTIVE III)

L T P

3 1 -

PREREQUISITIES: Computer Architecture and Microprocessors and Interfaces

OBJECTIVES: Having undergone a first course on Microprocessors and Interfaces, this course provides the student to the Advanced Architectural features of the State of the art Microprocessors.

COURSE CONTENTS:

Review of 8 bit microprocessors and support components [5 %]

Selected Case Studies of 16/32/64 bit microprocessors and support Contents [20 %]

RISC Architectures and Case Studies: RISC vs CISC [10 %]

Power PC 601 Alpha 21064, Pentium super space, Transputer Architectures and Case Studies : High Performance Embedded Micro controllers, Case Studies [25 %]

403 GA Development Systems and support [25 %]

Selected Applications [15 %]

TEXT BOOKS

1) J.T. Cain, Selected reprints on microprocessors and microcomputers, IEEE Computer Society Press, 1984

2) M. Rafiquzzaman, Microprocessors & Micro Computers Development systems, Harper tow 1984

3) M. Rafiquzzaman, Microprocessors & Micro Computers - Based system design, Universal Book Stall, New Delhi, 1990

4) INMOS Ltd. Transputer Development System, Prentice Hall, 1988

5) INMOS Ltd., Communicating Process Architecture, Prentice Hall 1988.

6) Wunnava V. Subbarao, 16/32 bit Microprocessors 68000/68010/68020, Software, Hardware & Design Applications, Macmillan Publishing Company, 1991

REFERENCES:

1) Kenneth Hintz, Daniel Tabak, Microcontrollers : Architetcure, Implementation & Programming McGraw Hill Inc. 1992.

2) Data Books by Intel, Motorola, etc.

3) Daniel Tabak, Advanced Microprocessors, McGraw Hill Inc. 1995.

4) Andrew M. Veronis, Survey of Advanced Micro Processors, Van Nostrand Reinhold, 1991 MCGraw Hill Inc. 1992.

5) Daniel Tabak, RISC Systems, Johan Wiley & Sons, 1990

6) The Power PC Architecture : A Specification for a New family of RISC Processors, Edited by Cathy May, Ed Silha, Rick Simpson, Hank Warren, Morgan Kaufmann Publishers, Inc., San Francisco, California, 2nd Edition (May 1994)

7) Chales M. Gilmore, Microprocessors Principles and Applications, McGraw Hill International Editions, 2nd Edition, 1995

8) Power PC 403GA Embedded Controller User's Manual

9) Power PC Tools - Development Tools For Power PC Microprocessor (Nov. 1993)

10) Power PC 601 RISC Microprocessor User's Manual - 1993

Departmental Elective - III

CS-424 EXPERT SYSTEMS

L T P

3 1 -

PREREQUISITIES : Data Structure and Programming, Design & Analysed Algorithm, Symbolic Logic and Logic Programming.

OBJECTIVES :

The major objectives of this course is to provide students with a view of various models of expert systems, its design, Implementation methods for Knowledge extraction and representation, Fuzzy and connectionist systems.

COURSE CONTENTS :

Expert Systems, Definitions types, components, Expert System Development Process [15 %]

Knowledge Representation Techniques-Logic Frames, Semantic Nets, etc. [15 %]

Domain Exploration Knowledge elicitation. Conceptualization, bathering Formlizations Methods of Knowledge Acquisition; Interviewing Sensor Data Capturing. [20 %]

Learning, Planning and Explanation in Expert System: Neural Expert System, Fuzzy Expert System, Real Time Expert Systems. [30 %]

Implementation Tools : Prolog, Expert System Shell Expersys, etc. Study of existing expert systems- TIERES, As Mycin & AM. [20 %]

TEXT BOOKS

1) Patterson, Introduction to AI Expert System, PHI, 1993

2) Jackson, Building Expert System, John-Wiley 1991.

Departmental Elective - III

CS-426 IMAGE PROCESSINGAND PATTERN RECOGNITION (ELECTIVE III)

L T P

3 1 -

PREREQUISITIES : SINGAL PROCESSING, LINEAR ALGEBRA
OBJECTIVES : This is in an introductory course in Image Processing which will familiarize the students with the basic concepts and algorithms in image Processing and Pattern Recognition areas.
COURSE CONTENTS :
Background : Introduction to electronic systems for image transmission and storage, computer processing and recognition of pictorial data, overview of practical applications. [5 %]
Fundamentals : Mathematical and perceptual preliminaries, human visual system model, image signal representation, imaging system specification building image quality, role of computers, image date formats. [15 %]
Image processing Techniques : Image enhancement, image restoration, image feature extraction, image data compression and statistical pattern recognition. [45 %]
Hardware architecture for image processing: Colour image signal representation, colour system transformations, extension of processing techniques to colour domain. [15 %]
Techniques of colour image processing: Colour image signal representation, colour system transformations, extension of processing techniques to colour domain. [15 %]
Applications of Image processing: Picture data archival, machine vision, medical image processing. [10 %]
TEXTS BOOKS
1) Pratt, W. K. Digital Image Processing, John Wiley, N. Y. 1978
2) Jain, A.K. fundamentals of Digital Image Processing, Englewood Cliffs, Prentice Hall, 1989
REFERENCES:
1) Rosenfield, A and Kak, A.C., Picture Processing, Academic Press N. Y. 1982

Departmental Elective - III

CS-414 GRAPHICAL USER INTERFACE (LAB)

L T P

- - 2

The practical is based upon the theory of paper CS-412

Departmental Elective - III

CS-428 ADVANCED MICROPROCESSORS (LAB)

L T P

- - 2

Students are expected to design and implement micro processor based systems for real life problem and evaluate the performance of various H/W plate forms e.g.

- Traffic light controller

- Data acquisition system

- Stepper motor control

- Electronic weighing machine

- Energy meter / billing systems

- Electronic Telephone call meter / Billing system

- Temperature controller

- Weather monitoring system

- Explosive detector

Departmental Elective - III

CS-430 EXPERT SYSTEMS LAB

L T P

- - 2

Students are required to develop expert system for various industries/real life problems.

· Medical Diagnosis

· Trouble Shooting of Computer Systems and PCs.

· Electrical Machines

· Chemical Processes

· Structure Analysis

Departmental Elective - III

CS-432 IMAGE PROCESSING AND PATTERN RECOGNITION (LAB)

L T P

- - 2

Atleast 10 experiments using suitable interactive tools' (PCs with imaging interface with atleast 2 exp.) involving independent program development by each student.

Experiments should demonstrate effect of IP algorithms and parameter variation on processed images qualitatively and quantitatively.

- Morphing

- Color Cutting

- Mixing

- Cloning

- Coloring black and white Image

CS-416 (Software Lab XIII) SL&LP

External Marks: 20 **L T P**
Internal Marks: 30 **- - 2**
Total Marks: 50

1. Study of Propositional Logic
2. Study of First Order Predicate Logic
3. Introduction to prolog programming by a simple prolog program
4. Program to check whether input is alphabet or not
5. Program to find if given nuber is positive or negative.
6. Write a program to check whether a given person is a member of Club
7. Program in prolog showing mapping that is constructing new structure similar to old one.
8. Program illustrating the use of recursion that is finding sum of first N integers.
9. Program to find the length of a list using 'Recursion' and then using "recursion and Accumulators';
10. Program to find the factorial of a number using recursion and accumulators and cut.
11. Program to calculate average tax illustrating cut-fail combination usage.
12. Program showing use of cut in Terminating a 'generate and test'. Program to play "Tic Tac Toe"
13. Write a program to generate fibonacci series upto the given no.
14. Write a program which accepts any number and checks whether it is prime or not.
15. To describe some basic predicates that are useful for manipulating lists.
16. Program for Bubble Sort
17. Program for Insertion Sort