



# Punjab Technical University

Jalandhar

**Syllabus Scheme**

**(3<sup>rd</sup> to 8<sup>th</sup> Semester)**

**For**

**Bachelor of Technology in**

**Information Technology**

**For 2002 Batch**

**Punjab Technical University, Jalandhar**  
**B.Tech. Information Technology**  
**Scheme of Syllabi ( 3<sup>rd</sup> 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
<b>Total (31 Hours)</b>			<b>17</b>	<b>6</b>	<b>8</b>	<b>390</b>	<b>460</b>	<b>850</b>

**Punjab Technical University, Jalandhar**  
**B.Tech. Information Technology**  
**Scheme of Syllabi ( 4<sup>th</sup> 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)	-	-	2	20	30	50	
9	CS-218	Software Lab-IV(SP)	-	-	4	20	30	50	
		General Fitness						100	
		<b>TOTAL (30 Hours)</b>	<b>15</b>		<b>5</b>	<b>10</b>	<b>380</b>	<b>320</b>	<b>700</b>
	CS-220	Industrial Institutional Training	* 6 weeks		-	-			100
			2 months during Break						

**Punjab Technical University, Jalandhar**  
**B.Tech. Information Technology**  
**Scheme of Syllabi ( 5<sup>th</sup> Semester )**

Sr. No.	COURSE CODE	COURSE TITLE	HOURS/WEEK			MARKS		
			L	T	P	INT	EXT	TOTAL
8.	CS-301	System Analysis and Design	3	1	-	40	60	100
2.	IT-303	Windows Programming	3	1	-	40	60	100
3.	CS-305	Data Base Management System	3	1	-	40	60	100
4.	IT-307	Electronics Commerce	3	1	-	40	60	100
5.	IT-309	Parallel Architecture & Computing	3	1	-	40	60	100
6.	IT-311	Windows programming Lab.	-	-	4	30	20	50
7.	CS-313	Data Base Management System Lab	-	-	4	30	20	50
8.	IT-315	Electronics Commerce Lab	-	-	2	30	20	50
		Industrial Training				60	40	100
<b>Total (30 Hours)</b>			<b>15</b>	<b>5</b>	<b>10</b>	<b>350</b>	<b>400</b>	<b>750</b>

**There should be industrial/institutional training of 6 weeks in summer vacation after 4<sup>th</sup> semester**

**Punjab Technical University, Jalandhar**  
**B.Tech. Information Technology**  
**Scheme of Syllabi ( 6<sup>th</sup> Semester )**

Sr. No.	COURSE CODE	COURSE TITLE	HOURS/WEEK			MARKS		
			L	T	P	INT	EXT	TOTAL
1.	IT-302	Advanced Internet Technology	3	1	-	40	60	100
2.	IT-304	Management Information System	3	1	-	40	60	100
3.	IT-306	Web Administration	3	-	-	40	60	100
4.	IT-308	Network operating System	3	1	-	40	60	100
5.	IT-310	Open Elective	3	1	-	40	60	100
6.		Elective –I	3	1	-	40	60	100
7.	IT-314	MIS Lab.	-	-	2	30	20	50
8.	IT-316	Web Administration Lab.	-	-	4	30	20	50
9.	IT-318	Network Operating System Lab.	-	-	4	30	20	50
		General Fitness						100
<b>Total (33Hours)</b>			<b>18</b>	<b>5</b>	<b>10</b>	<b>330</b>	<b>420</b>	<b>850</b>

**Open Elective: For other branches**  
**IT-310 OPERATION RESEARCH**  
**Elective – I**  
**IT-312 Expert Systems**  
**IT-320 Neural Networks**  
**IT-322 Artificial Intelligence and Applications**

Punjab Technical University, Jalandhar B.Tech. Information Technology Scheme of Syllabi ( 7 <sup>th</sup> Semester )					
	Course Title		Internal	Ext.Viva	TOTAL
	6-month Industrial Training		500	500	1000

**Punjab Technical University, Jalandhar**  
**B.Tech. Information Technology**  
**Scheme of Syllabi ( 8<sup>th</sup> Semester )**

Sr. No.	COURSE CODE	COURSE TITLE	HOURS/WEEK			MARKS		
			L	T	P	INT	EXT	TOTAL
1.	IT-402	Introduction to Java	3	1	-	40	60	100
2.	IT-404	E-Services	3	1	-	40	60	100
3.	CE-216	Environmental Sciences	3	1	-	40	60	100
4.		Elective-II	3	1	-	40	60	100
5.		Elective-III	3	1	-	40	60	100
6.	IT-410	Major Project	-	-	8	100	100	200
7.	IT-412	Java Practical Lab.	-	-	4	30	20	50
		General fitness						100
<b>Total (32 Hours)</b>			<b>15</b>	<b>5</b>	<b>12</b>	<b>330</b>	<b>420</b>	<b>850</b>

**Elective –II****IT-406 Multimedia and Applications****IT-414 Data Warehousing and Mining**

**Elective –III**  
**IT-416 Modelling and Simulation**  
**IT-408 Software Project Management**





**CS-203****MATHEMATICS – III**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**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. Rolle's 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 Green's 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 Eastern 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.**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**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**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:**

The algorithms presented should be written in a pseudocode similar to the programming language Pascal / C and therefore, the readers should preferably 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.

Bertziss, 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. McGraw- 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)**

**Internal marks : 40**

**L T P**

**External marks : 60**

**2 1 0**

**Total marks :100**

**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**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**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 )****Internal marks : 30**  
**External marks : 20**  
**Total marks :50****L T P**  
**0 0 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 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)**

**Internal marks : 30**  
**External marks :20**  
**Total marks :50**

**L T P**  
**0 0 2**

1. Verification of the truth tables of TTL gates, e.g., 7400, 7402,7404, 7408, 7432, 7486.
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)**

**Internal marks : 30**  
**External marks : 20**  
**Total marks :50**

**L T P**  
**0 0 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**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**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**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**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 semigroups 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**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES: 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 Algorithms, 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**

**Internal marks : 40**

**L T P**

**External marks : 60**

**3 1 0**

**Total marks :100**

**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, Arithmetic group, Logical group, Branch Group.

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

PROM Programming ,Emulator, 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 traffic light system stepper motor interface

**6. Basic architect (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**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**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 )**

**Internal marks : 30**  
**External marks : 20**  
**Total marks :50**

**L T P**  
**0 0 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 )**

**Internal marks : 30**

**External marks : 20**

**Total marks :50**

**L T P**

**0 0 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)

**Internal marks : 30****External marks : 20****Total marks :50****L T P****0 0 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 of 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 - IV (SP)**

**Internal marks : 30**

**External marks : 20**

**Total marks :50**

**L T P**

**0 0 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**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:** 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 [8%]**

**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 [2%]**

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

**3. System Development cycle [4%]****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 [8%]**

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 [25%]**

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 [4%]**

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

### **7. Modular and structured design [8%]**

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

### **8. System Implementation and Maintenance [5%]**

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 [4%]**

**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 [12%]**

Introduction to Object Oriented Analysis and design life cycle, object modeling: Class Diagrams, Dynamic modeling: state diagram, Dynamic modeling: sequence diagramming.

**References: -**

1. System Analysis and Design Methods, Whitten, Bentley and Barlow, Galgotia Publication.
2. System Analysis and Design Elias M. Award, Galgotia Publication
3. Modern System Analysis and Design, Jeffrey A. Hofer Joey F. George Joseph S. Valacich Addison Weseley.

**IT-303****Windows Programming**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:** -Programming Languages.

**OBJECTIVES:-** Understanding Windows architecture, various resources and developing the GUI features.

**COURSE CONTENTS****1.The Window Architecture [L-4]**

The concept of handlers, The concept of window class, Registering a Window class, Style like CS HREDRAW, Instance handlers, Icon handlers, Cursor handlers, Menu name, Creating a Window, Class names - predefined and user defined, Window name, Draw styles, Width, height etc., Parent - Child Windows, The concept of windows messages, Messages Queue,

**2. Compiling and linking for windows [L-2]**

Compiling for windows, Memory models in windows, Linking the stub file.

**3. I/O Techniques [L-2]**

Drawbacks of windows, Screen printing, Determining the size of window, The concept of device context, Device context handles, Releasing context handles, Text formatting, Using fonts, The concept of scroll bars, Creation of scroll bars, Setting bar range and position,

**4. Keyboard [L-2]**

Keyboard messages, Virtual key codes, Parameters like repeating count, canning code etc., System, keys like Alt-Tab, Ctrl-Esc Et.

**5. Mouse [L-2]**

Mouse action, Mouse messages, Activating Windows, Change Mouse Cursor.

**6. File I/O [L-2]**

Windows file function, Buffered file I/O, Common dialog boxes , Open filename structure.

**7. Child Window [L-4]**

The concept of child windows, Child window controls, Child window control classes, The static class, The button class, Button messages, Push buttons, Check boxes, Radio buttons, Edit class, Edit control messages, Edit styles, The List box class.

### **8. Menus [L-2]**

Creating menus, Working of menus, Using menu inputs, Creating pop-ups and using it, Attaching pop-ups to top level, menus, Menu messages, Menu templates, Using system menu, Messages from menus.

### **9. Dialog Boxes [L-2]**

Concept, Control state, working with dialog boxes.

### **10. Printing [L-2]**

Obtaining printer's driver content, determining the printer name, Notifying the print job, Page breaks, determining device capabilities, Printing graphics, about printer.

### **11. Graphics [L-4]**

Fonts, Portrait of a character, Types of fonts, Creating logical fonts, fonts handle.

### **12. Graphical Device Interface [L-2]**

Need, The device context, Determining device capabilities.

### **13. Memory Management [L-12]**

Memory handles and locks, Problems or Window memory handling, Intel's segmented memory architecture, 80286 protected mode, the memory API, Kernel Macros.

#### **References :-**

1. Windows Programming Primer Plus by Jim Conger Galgotia Publication
2. Programming Window 3.1 by Deepak Kumar BPB Publication Supplementary Reading
3. Window API Bible ,Gonger Galgotia Publication.



CS– 305

**DATABASE MANAGEMENT SYSTEMS**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**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 Tuple 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.

**IT-307****Electronic Commerce**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:-**Internet and WWW.

**OBJECTIVES:-** The course provides the knowledge about Business transactions using new technologies.

**COURSE CONTENTS****1. Introduction to Electronics Commerce [15%]**

Defining Electronics Commerce, Forces fueling Electronics Commerce, Electronics Commerce Industry Frame work, Types of Electronics Commerce.

**2. World Wide Web and its applications [20%]**

Brief history and introduction of WWW, The web and the Electronics Commerce, Key concepts behind Web, Web and Database Integration, Web Software development tools (HTML, XML, UML, Java script, VB script, ASP, JSP), Multimedia Web extensions (VRML, Real Audio, Internet and Web based Technology), Directories and search engines.

**3. Firewalls and Transaction security [15%]**

Introduction to firewalls and network security (Types, policies and Management), Transaction Security, Encryption and Transaction Security, The comparison of encryption methods, Security in WWW (Netscape's secure socket layer, security and online web based banking)

**4. Electronics Payment Systems [8%]**

Overview of the Electronics payment technology, Electronics cash, Electronics checks, online credit cards based system, other emerging financial instruments.

**5. Electronics Commerce and banking [8%]**

Home Banking, Banking via the PC using Internet/Intranet, Banking via online services, Banking via Web.

**6. Electronics Commerce and Retailing [8%]** Changing Retail industry dynamics and technology improvements in Electronics retailing, Mercantile models from consumers perspective

**7. Supply chain management [8%]**

Fundamentals and management of supply chains, Supply chain application software and its future.

**8. Roadmaps to E-Business [8%]**

Challenges and strategy creation, Roadmaps to E-Business.

**9. Translating E-Business strategy into action [10%]**

Beginning of a virtual factor, E-business blueprint creation, E-Business project planning checklist, an execution blueprint, Failures of E-Business Initiatives.

**References:-**

1. E-Business - Roadmap for success by Dr Ravi Kalkota Published by Addison Wesley (Pearson Education Asia).
2. Electronic Commerce by David Kosiur Published by Microsoft Press.
3. Electronic Commerce by Ravi Kalakota and Andrew B. Whinston Published by Addison Wesley

**IT-309 PARALLEL ARCHITECTURE AND COMPUTING**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:** -Computer Architecture.

**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.

**COURSE CONTENTS****1. Introduction and Classification of Parallel Computer [8%]**

Parallel processing terminology, Flynn's and Hndler's classifications, Amdahl's law.

**2. Pipelined and Vector Processors [12%]**

Instruction pipelining, Reservation table, Data and control hazards and methods to remove them

**3. SIMD or Array Processors [12%]**

Various interconnection networks, Data routing through various networks, Comparison of Various networks, Simulation of one network another.

**4. MIMD and Multi Processor Systems [12%]**

Uniform and non-uniform memory access multi processors, Scheduling in multi processors systems, Load balancing in multi processors systems.

**5. PRAM model of Parallel Computing and Basic Algorithms [7%]**

PRAM model and its variations, Relative powers of various PRAM models.

**6. Parallel Algorithms for Multi Processor Systems [25%]**

Basic construction for representing PRAM algorithm, Parallel reduction algorithm, Parallel prefix computing, Parallel list ranking, Parallel merge, Brent's theorem and cost optimal algorithm, NC class of parallel algorithms.

**7. Parallel Algorithms for SIMD and Multi Processor System [4%]** Introduction to parallel algorithms for SIMD and Multi Processor System

**REFERENCES: -**

1. K. Hwang and F.A. Briggs: computer Architecture and Parallel Processing, McGraw Hill New York 1984 ion

2. Michael Quinn Parallel Computing Theory and Practice Mc Graw Hill  
International Edition, Computer Science Series, 2nd Edition 1994 Supplementary  
Reading
3. S. G. Akl: Design and Analysis of Parallel algorithms Prentice Hall  
Edglewood Cliff NJ
4. S Lakshmivarahan and S. K. Dhall: Analysis and Design of Parallel  
Arithmetic-Arithmetic and Matrix Problems, McGraw Hill
5. Kai Hwang: Advance Computer Architecture-Parallelism, Scalability and  
programmability, Mc Graw Hill International.

**IT-311**

**WINDOWS PROGRAMMING LAB**

**Internal marks : 30**  
**External marks : 20**  
**Total marks :50**

**L T P**  
**0 0 4**

- Designing windows applications using c++/VC
  - Mouse Handling
  - Keyboard handling
  - File Handling
- I/O handling · Handling various techniques like Child Windows, Dialog Boxes, Menus, Graphics, printing, Graphics Device Interface, memory Management.

**CS-313**

**DATABASE MANAGEMENT SYSTEMS LAB**

**Internal marks : 30**  
**External marks : 20**  
**Total marks :50**

**L T P**  
**0 0 4**

- Laboratory Exercise in use of SQL for
- Defining schema for application
  - For populating sample database
  - For making SQL query for information retrieval
  - Use of host language interface embedded SQL. Programming assignments on query processing transaction management join algorithms.

**IT 315**

**ELECTRONICS COMMERCE LAB**

**Internal marks : 30**  
**External marks : 20**  
**Total marks :50**

**L T P**  
**0 0 2**

- 1 Introduction to html, VB Script, Java Script .
2. Development of personal web page with

- Bio-data
- Contacts
- Hobbies

3. Development of web site of any organization,  
Informative web sites.

Web site must contain

- links to home pages
- features/ products of company /organisation
- employee information
- administration information
- company polices.



**SIXTH SEMESTER**

**IT-302            ADVANCED INTERNET TECHNOLOGY**

**Internal marks : 40**

**L T P**

**External marks : 60**

**3 1 0**

**Total marks :100**

**PREREQUISITES:-**Computer Networks-I.

**OBJECTIVES:-** The course provides the knowledge about various Network Protocols.

**COURSE CONTENTS:**

**1. Introduction[10%]**

Layering,TCP/IP Layering,Internet Addresses, The Domain Name System,Client-Server Model, Port Numbers, Implementations and Application, Programming interfaces.

**2. The Link Layer Ethernet and IEEE 802 EncapsulationTrailer Encapsulation [10%]**

SLIP : Serial Line IP, Compressed SLIP, PPP : Point-to-Point Protocol .

**3. IP : The Internet Protocol[15%]**

IP Header, IP Routing,Subnet Addressing, Subnet Mask, Special Case IP Addresses .

**4. Introduction to ARP [10%]**

Address Resolution Protocol and RARP : Reverse Address ResolutionProtocol,

ARP Packet Format, Proxy ARP, RARP Packet Format

**5. ICMP [15%]**

Internet Control Message Protocol Introduction, ICMP, Message Types, ICMP Address, Mask Request and Reply , IP Routing Routing Principles, Introduction to Dynamic Routing

**6. UDP [5%]**

User Datagram Protocol UDP Header, UDP Checksum

**7. DNS :[5%]**

The Domain Name System DNS Basics, DNS Message Format, security .

**8. TCP [15%]**

Transmission Control Protocol TCP Services, TCP Header TCP Connection ,Establishment and Termination,TCP Timeout and Retransmission, Repacketization

**9. Telnet and Rlogin[5%]**

Remote Login Rlogin Protocol, SMTP Protocol

**10. FTP : File Transfer Protocol and SMTP : Simple Mail Transfer Protocol[10%]**

**REFERENCES:**

TCP/IP Illustrated, Volume 1 : The Protocols (Addison-Wesley Professional Computing Series)  
by Richard Stevens

IT-304

**MANAGEMENT INFORMATION SYSTEMS**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:-None**

**OBJECTIVES:-** Understanding the planning of Information Systems.

**COURSE CONTENTS**

**Introduction :** Definition and significance, Evolution, MIS Support for programmed and nonprogrammed decision making Model of decision making.[10%]

**Structure of MIS :** Based on management activity and organisational function, Conceptual and physical structure of MIS[15%]

**Information concept :** Definition of information, information presentation Quality of information DSS (decision support system) : Characteristics of DSS, Decision support and structure of decision-making, Decision support repetitiveness of decisions, Classes of DSS, DSS users, GDSS, Characteristics of GDSS.[30%]

Organisation and Information systems of information system, data and information Classification of information system, Definition of organisation.[15%]

**Introduction to ERP :** Evaluation of ERP, Integrated management, Supply-chain management and Resource management, Benefits of ERP.ERP implementation, Generalised model, Role vendors, Consultants and users.Future of ERP applications, Marketing of ERP.[30%]

**REFERENCES:-**

MIS by Jordan Davis, 2nd Edition

MIS by James A.O. Brien, Galgotia Publication, 4th Edition

MIS by Kamna Malik MIS by C S V Murthy (Himalaya Publishing House) ERP by Vinod Kumar Garg

MIS by D P Goel

**IT-306**

**WEB ADMINISTRATION**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 0 0**

**PREREQUISITES:-**E-Commerce.

**OBJECTIVES:-** The course provides the knowledge in designing the web pages using different packages.

**COURSE CONTENTS**

**HTML :-** Formatting text, hyperlinks and color in web pages creating tables and frames. Working with images, maps and forms.[25%]

**Scripting Languages :-** JavaScript- Using Operators, statements, function, handling events and working with objects. Creating frames, Processing forms, using hidden fields and cookies. Working with links and images.[15%]

**Active Server Pages (ASP) :-** ASP basic architecture, Request Object, response Object, application Object, Session Object, Server Object Database Access in ASP.[25%]

**XML :-** Creating an XML document, Using element, declaration and examination attribute declarations, using XML in an HTML document, XML on the web.[25%]

**WAP :-** Introduction to WAP. [10%]

**RERFERNCES:-**

Active Server pages 3 Developers Guide- Alberto Manuel Ricart, Stephen Asbury, DIG Books India.

HTML 4 By QUE

Teach Yourself HTML 4 With XML, DHTML and Java Script - Stephine Cottrell Bryant

**IT-308**

**NETWORK OPERATING SYSTEM**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:-**Computer Network-I.

**OBJECTIVES:-** The course provides the sufficient knowledge about the theoretical and practical aspects of Networks and their applications.

**COURSE CONTENTS**

Introduction to window NT server, window NT features, hardware requirements, Planning the network, Window NT network security model, Special purpose server, Licensing. [30%]

Planning storage strategies, Working with disk administrator and backup, Networking and networking protocol, Configuration of window NT. [15%]

Window NT services architecture and security architecture, Planning and managing groups and users accounts file services. Distributed file system, Remote administration. Remote access services, Internet and Intranet Printing and supporting networking clients, Performance tuning.[40%]

ATM TechnologiesComparative study of Ethernet, FDDI and ATM technologies [15%]

**REFERENCES:-**

MCSE NT Server 4 Study Guide by Mathew Strebe, Charles Perkin and James Chellis Perkin and James Chellis Nt Server 4.0 Exam Cram Dream Tech Publisher

IT-310

**OPERATION RESEARCH****(Open Elective, for other branches)****Internal marks : 40****L T P****External marks : 60****3 1 0****Total marks :100****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 &amp; Applications [10%]

Linear Goal Programming methods and applications [5%]

Simulation [10%]

**REFERENCES:**

1. Operation Research by D.S Hira.
2. Operation Research by D.S Sharma.
3. F.S Hillier & G.J. Lieberman, Introduction to OR, Mcgraw hill Int. Series 1995
4. A Ravindran, Introduction to OR. John Wiley & Sons, 1993
5. R.Kapoor, Computer Assisted Decision Models, Tata Mcgraw Hill 1991

**IT-312            EXPERT SYSTEM(Elective 1)**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:** None

**OBJECTIVE:** The course provides the deep knowledge about expert 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, Conceptualisation, battering formulizations methods of knowledge Acquisition, Interviewing sensor data capturing. [20%]

Learning planning and exploration in expert system, neural system, fuzzy expert system, and Real-time expert system. [25%]

Implementation Tools: Prolog, expert system shell expersys, etc, study of existing expert systems - RIERES, Myein & AM.[25%]

**REFERENCES:**

1. Patterson, Introduction to AI Expert System, PHI, 1993
2. Jackson, Building Expert System, John - Wiley 1991
3. Introduction to Expert System - Jackson - Addison Wesley Expert Systems by - Wichcoff
4. AI & expert system - Patterson





**IT-322 Artificial Intelligence and Applications(Elective-I)**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:** None

**OBJECTIVE:** The course provides the deep knowledge about machine intelligence.

**COURSE CONTENTS:**

General Issues and Overview of AI [5%]

The AI problems, what is an AI technique, Characteristics of AI applications [5%]

Problem Solving, Search and Control Strategies [5%]

General problem solving, production systems, Control strategies: Forward and backward chaining, Exhaustive searches: Depth first Breadth first search. [10%]

Heuristic Search Techniques, Hill climbing, Branch and bound technique, And/OR graphs [10%]

Game Playing [10%]

Minimax search procedure, Knowledge Representation [10%]

Knowledge Representation using predicate logic [10%]

Resolution theorem and Unification AI Programming Languages [10%]

Expert System [5%]

Introduction to Expert System, Characteristics of Expert System and application of Expert System. [10%]

**REFERENCES:**

1. Artificial intelligence by Rich & Knight
2. AI & expert system by Patterson
3. Introduction to LISP- Rajiv Sangal Tata McGraw

**IT-314**

**MIS Lab**

**Internal marks : 30**

**External marks : 20**

**Total marks :50**

**L T P**

**0 0 2**

Students have to perform case studies for the following

1. MIS and its functional subsystems
2. Study of physical and conceptual structure of MIS
3. Study of DSS, its users and characteristics
4. Study of information system and its types
5. Study of GDSS and its possible configurations
6. Study of ERP and its applications
7. Study of information parameters (age, quality and value)
8. Study of ERP marketing and implementation

**IT-316 WEB ADMINISTRATION LAB**

**Internal marks : 30**  
**External marks : 20**  
**Total marks :50**

**L T P**  
**0 0 4**

Students are required to write code snippets, which covers the following objectives 1. Design Simple Web Pages using standard HTML tags like, HEAD, TITLE, BODY

2. Design HTML web pages, which make use of

INPUT, META, SCRIPT, FORM, APPLET, BGSOUND, MAP

3. Working with various attributes of standard HTML elements

4. Using Java Script's Window and document objects and their properties and various methods like alert (), eval (), ParseInt () etc. methods to give the dynamic functionality to HTML web pages

5. Writing Java Script snippet which make use of Java Script's inbuilt as well as user defined objects like navigator, Date Array, Event, Number etc.

6. Write code which does the form validation in various INPUT elements like TextFiled, Text Area, Password, Selection list etc.

7. Writing Server side programs for web pages using ASP's Request, Response, and Application objects.

8. Writing ASP programs which make usage of Session, Server Objects

9. Using Database Access in ASP

10. Writing XML web Documents which make use of XML Declaration, Element Declaration, Attribute DecelARATION.

11. Usage of Internal DTD, External DTD, Entity Declaration.

**IT-318      NETWORK OPERATING SYSTEM LAB**

**Internal marks : 30**  
**External marks : 20**  
**Total marks :50**

**L T P**  
**0 0 4**

Students are required to perform following list of practical

1. Installation of windows NT 4.0 with different options
2. Unattended installation of windows NT 4.0 with different options
3. Create user accounts and to apply different account policies
4. Using disk administrator to create partitions, volumes and strip sets etc.
5. Formatting the partition with NTFS file system or to convert the file system from fat to NTFS
6. Assigning different rights to user and determining the effective rights of user in different situations
7. Creating and managing shares
8. Exploring various options in windows NT backup
9. Configuring and maintaining the printing in windows NT network
10. Configuring windows NT server 4.0
11. Connecting windows NT clients
12. Study of windows NT 4.0 RAS service

**SEVENTH SEMESTER  
INDUSTRIAL TRAINING**

**EIGHTH SEMESTER**

**IT-402 INTRODUCTION TO JAVA**

**Internal marks : 40**

**L T P**

**External marks : 60**

**3 1 0**

**Total marks :100**

**PREREQUISITES:-OOPS Using C++**

**OBJECTIVES: -To Provide the advanced Knowledge about OOPS.**

**COURSE CONTENTS**

**An overview of Java:**

Object oriented programming, Two paradigms, abstraction, the, OOP principles, Java class libraries [5%]

**Date types, variables and arrays:-**Integers, floating-point types, characters, Boolean, Iterates, Variable, Data types and casting, automatic type promotion in expressions arrays. **Operators: -** Arithmetic operators, bit wise operators, relational operators, Boolean logical assignment operators, the? Operator, operator precedence **Control statements: -**Java's selection statements, iteration statements, jump statements [15%]

**Introduction to classes: Class** fundamentals, declaring object reference variable, Introducing methods, constructors, the key word, garbage collection, the finalize () method. **Methods and Classes :-**Overloading methods, using objects as parameters, recursion [15%]

**Inheritance:** Inheritance basics, using super, method overriding, dynamic method dispatch, using abstract Classes, Using final with inheritance, Package and Interfaces, Package asses protection, importing packages [10%]

**Exception handling:** Exception handling fundamentals., Exception types, Uncaught Exceptions Using try and catch, multiple catch clauses, nested try statements throw, finally Java built in exception creating your own exception sub classes, using exceptions. [5%]

**Multithreaded Programming:** The Java thread model, the main thread, creating thread, creating multiple thread, using is alive () and join (). Thread priorities, synchronization, Inter thread communications, suspending resuming and stopping thread using multithreading [15%]

**String handling:** The string constructor, string length, special string operator character extraction, string comparison, searching string, modifying string, data conversion, changing the case of characters, string buffer. [10%]

**Networking:** Networking basics, Java and the Internet Address, TCP/IP client Sockets URL, URL connection, TCP/IP server Sockets The Applet Class [15%]

**The Applet Class:** its architecture displays methods. The HTML APPLET. Passing parameters to Applet. The get Documentation Base () and get Code Base () methods Applet Context And Show Document () [10%]

**REFERENCES:**

1. Java 2 Computer Reference (Tata McGraw Hill)
2. Core Java-I (Addison Wesley) - horstmann
3. Core Java - II (Addison Wesley)
4. Thinking in Java (Bruce Eckel)

IT-404

**E-SERVICES****Internal marks : 40****L T P****External marks : 60****3 1 0****Total marks :100****PREREQUISITES:** -Knowledge of Internet.**OBJECTIVES:** - Understanding the Applications of Information Technology**COURSE CONTENTS****(1) E-Financial Transaction [50%]**

**i. Introduction to accounting** - accounting as an information system concepts, conventions and principles of accounting role of an accountant in an organization, Branches of accounting financial, cost and management accounting and their interrelationships.

**ii. Accounting cycles:** preparation of financial statements of an organization (with - adjustment)

**iii. Electronic payment systems**

**iv. E-banking:** E-financial transaction and E-currency

**v. Trading on Internet:** online stock, bonds, mutual funds, shares, study service assessment and risk management.

**vi. Legal issues in E-transaction (through case studies)**

**vii. E-business solution to ROI:** financial modeling etc., Robertson model, Altman's model. ETHBSAI model and other important models, Horigan's model-development of new models.

**(2) E-marketing and Advertising [50%]**

**i. Insurance**

**ii. Budgeting**

**iii. Security:**signature coding

**iv. Introduction to marketing**

**v. Marketing concepts and orientation, marketing tasks and marketing in modern context .**

**vi. Marketing planning and marketing process:** marketing systems and environment .

**vii. Consumer behaviour:** factors influencing buying process

**viii. Market segmentation and targeting**

**ix. Marketing**

**REFERENCES:**

1. E-Marketing by Philip Kotler
2. E-Business by Kalakota - Robinson
3. E-Business Revolution - Amor
4. E-Business with Netcommerce - Shurety (Addison Wesley)

CE-216

**ENVIRONMENTAL SCIENCE****Internal marks : 40****L T P****External marks : 60****3 1 0****Total marks :100**

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 loss, 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 rehabilitation 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 (Prevention 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)

**IT-406      MULTIMEDIA AND APPLICATION (ELECTIVE - I)**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:** -Knowledge of I/O devices.

**OBJECTIVES:-**Understanding the various multimedia Technologies and their uses.

**COURSE CONTENTS**

Introduction to multimedia technology - computers, communication and entertainment framework for multimedia system, M/M devices, presentation devices and the user interface, M/M presentation and authoring. [15%]

Digital representation of sound and transmission, brief survey of speech recognition and generation, digital video and image compression, JPEG image compression standard, MPEG motion video compression, DVI technology, timbered media representation and delivery. [20%]

M/M software environments, limitations of workstation operating systems, M/M system services, OS support for continuous media applications, media stream protocol, M/M file system and information representation system, and data models for M/M and hypermedia information. [20%]

Application of M/M, intelligent M/M system [15%]

Desktop VR, virtual reality OS, distributed virtual environment system, virtual environmental displays and orientation tracking, visually coupled systems requirements, intelligent VR software systems.[20%]

Applications of environments in various fields such as medical entertainment, manufacturing, business, education etc.[10%]

**REFERENCES:**

1. Multimedia on the Web - Stephen McGloughlim PHI
2. Multimedia production, planning & Delivery - Villamil-Casanova & Nolina PHI
3. Multimedia sound & video - Lozano PHI
4. Multimedia in Practice Tech & application - J. Jeefcoate.

**IT-414 DATA WAREHOUSING AND MINING ELECTIVE-I**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:** -System Analysis And Design.

**OBJECTIVES:-** To Inspect, Control and Secure Information.

**COURSE CONTENTS**

**Data ware housing:** warehouse environment, architecture of a data warehouse

Methodology, analysis, design, construction and administration.[40%]

**Data mining:** extraction model and patterns from large database, data mining techniques,

Classification, regression, clustering summarization, dependency modeling, link analysis,

Sequence analysis, mining scientific and business data.[60%]

**REFERENCES:**

1. A Guide to Data Warehousing - Hocht
2. High Performance Data Mining - Robert Grossman
3. Data Mining using Grammar based Genetic Programming - Man Leungwong · App 2
4. Data Warehousing in Real World - Anahory
5. Data Mining - Addisiaans (Addison Wesley)

**IT-416 MODELLING AND SIMULATION (ELECTIVE II)**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:** -Mathematics and C

**OBJECTIVES:** - The course provides the sufficient knowledge to simulate various working systems.

**COURSE CONTENTS:**

Definition of A system, Types of System - Continuous, Discrete and Hybrid. [15%]

Modelling Process and Definition of a Model, computer workload and preparation of its model, verification and validation modeling procedures.[15%]

Comparing Model Data with real system data, differential and partial differential equation models, combining discrete event and continuous models. (Example of a computer system should be used for illustration and discussion purposes) [25%]

Simulation Process use of simulation, discrete and continuous simulation procedures, simulation of a time-sharing computer system. [15%]

Simulation language, a brief introduction to important discrete and continuous simulation language, study and use of one language in detail. [20%]

Use of database and AI techniques in area of modelling and simulation. [10%]

**REFERENCES:**

1. System Simulation - G. Gorden
2. System Simulation & Modelling - Narsingh Deo PHJ

**IT-408 SOFTWARE PROJECT MANAGEMENT (ELECTIVE – II)**

**Internal marks : 40**  
**External marks : 60**  
**Total marks :100**

**L T P**  
**3 1 0**

**PREREQUISITES:** -System Analysis and Design

**OBJECTIVES:** -. The course should seek to equip the student with a repertoire of principles, tools and techniques and make him/her appreciate that software engineering is an exercise in making compromises. .

**COURSE CONTENTS****1. The software Engineering Problem [5%]**

The software engineering problem and software products, All of the software engineering activities, The concept of software product like cycle model

**2. Software evolution [5%]**

The concept of a software like cycle, The various forms of a software product-form initial conception through development and operation to retirement, Controlling activities and disciplines to support evolution, Planned and unplanned events that affect software evolution, The role changing technology.

**3. Technical Communication [5%]**

Fundamentals of technical communication Oral and Written communications, preparing oral presentation and supporting material, Software project documentation of all kinds, ISO/Other, e.g. IEEE .

**4. Software Configuration management [15%]**

Concept of configuration management, Its role in controlling software evolution, Maintaining Product integrity, Changing control and version control, Organization structure for configuration

**5. Software Quality Assurance [20%]**

Software quality assurance as a controlling discipline, Organizational structures for quality assurance, Independent verification and validation teams, Test and evaluation teams , Software technical reviews , Software quality assurance plans : ISO 9000, ANSI/IEEE

**6. Standards [15%]**

Introduction to standards - ISO 9002 and ISO 9003 - Quality system development, SO 9000 standard for software, Understanding ISO 900-3 clauses, SEI model - capability

Maturity model - Five levels Bootstrap method, Implementing ISO 9000, Analysis the Quality system, Documenting & Auditing quality system, ISO 9000 registration process & Accreditation System, Total Quality Management

**7. Software Project organizational and management issues [20%]**

Staffing - development, organizations, quality assurance teams , project planning - choice of process model, project scheduling and milestones, resource allocation

**8. Software project economics [15%]**

Cost estimation, risk analysis for software projects, factors that affect cost.

**REFERENCES**

1. S/W Engineering - Somerville (Addison Wesley) .
2. S/W Engineering-Pressmen.
3. S/W Engineering -Jalota

**IT-410**

**MAJOR PROJECT**

**Internal marks : 100**

**External marks :100**

**Total marks :200**

**L T P**

**0 0 8**

1. Project should include following phases

- System analysis and design
- Coding - Implementation
- Testing

2. Should be a working project

3. Must have a future perspective

4. It may be a

- Database
- Application software
- System software
- Multimedia
- Web Related

5. A complete project report must be submitted along with softcopy of project. Project report may include requirements of project, Flow Chart, DFDs, coding and test results.



**IT-412****Java Practical Lab****Internal marks : 30****External marks :20****Total marks :50****L T P****0 0 4**

**Students are required to write a code snippet that covers the following objectives.**

1. Write a Java programs which does the creation of Class and object.
2. Usage of import statement and package declaration in java programs.
3. Declaring variables of various data types and their effect by changing the access modifiers like private, public,protected, default.
4. Usage of Java keywords final, static, transient, volatile, synchronized at appropriate places in java programs.
5. Writing programs which make use of Arithmetic Operators, Comparison Operators, Logical Operators, Bit wise Operators.
6. Writing programs which make use of && and || operators.
7. Write Java programs, which make use of control Statement like if, while, do while. Try, catch, finally, throw, throws.
8. Write code snippets which make usage of Method Overloading, method Overriding, recursion,
9. Using super, this, super (), this () in Java Programs.
10. Write Java Programs, which make usage of Exception handling
11. Write java programs that make usage of java lang.awt package and design GUI.
12. Usage of event handling in Java GUI (Graphical user interface) programs.