B.Tech(CSE) + MBA

III Semester

paper Code	Subject		Teaching hours			Credit point
			L	**T**	**P**	
03BCS101	Digital Electronics		3	0	0	3
03BCS102	Electronic Devices & Circuits		3	1	0	4
03BCS103	Data Structure and Algorithms		3	0	0	3
03BCS104	Discrete Mathematical Structures		3	0	0	3
03BCS105	Mathematics III		3	1	0	4
03BCS106	Electives (Any one of the following)		3	0	0	3
	1	Intellectual Property Rights				
	2	Internet Technology				
	3	Management Information Systems				
03BCS201	Digital Electronics Lab		0	0	3	2
03BCS202	Electronics Lab		0	0	3	2
03BCS203	Data Structure Lab		0	0	3	2
03BCS204	Humanities and Social Science		0	0	3	2
03BCS301	Discipline & Extra Curricular Activities		0	0	4	1
TOTAL			**18**	**2**	**16**	**29**

IV SEMESTER

Subject Code	Name of Subject	Teaching hours			Credit point
		L	T	P	
04BCS101	Principles of Programming Languages	3	0	0	3
04BCS102	Microprocessor and Interfaces	3	0	0	3
04BCS103	Object Oriented Programming	3	1	0	4
04BCS104	System Software	3	0	0	3
04BCS105	Statistics and Probability Theory	3	1	0	4
04BCS106	Electives (Any one of the following)	3	0	0	3
	1 Open Source Technology				
	2 E-Commerce				
	3 Analog & Digital Communication				
04BCS201	Communication Lab	0	0	3	2
04BCS202	Microprocessor Lab	0	0	3	2
04BCS203	Object Oriented Programming Lab	0	0	3	2
04BCS204	System Software Lab	0	0	3	2
04BCS301	Discipline & Extra Curricular Activities	0	0	4	1
TOTAL		**18**	**2**	**16**	**29**

V SEMESTER

Subject Code	Name of Subject		TEACHING HOURS			CREDIT POINT
			L	T	P	
05BCS101	Software Engineering		3	1	0	4
05BCS102	Computer Architecture		3	0	0	3
05BCS103	Database Management Systems		3	0	0	3
05BCS104	Computer Graphics		3	0	0	3
05BCS105	Telecommunication Fundamentals		3	1	0	4
05BCS106	Electives (Any one of the following)		3	0	0	3
	1	Logic & Functional Programming				
	2	Information Theory and Coding				
	3	Advanced Data Structure				
05BCS201	Software Engineering Lab		0	0	3	2
05BCS202	Computer Architecture Lab		0	0	3	2
05BCS203	Database Management Lab		0	0	3	2
05BCS204	Computer Graphics Lab		0	0	3	2
05BCS301	Discipline & Extra Curricular Activities		0	0	4	1
TOTAL			**18**	**2**	**16**	**29**

VI SEMESTER

Subject Code	Name of Subject		TEACHING HOURS			CREDIT POINT
			L	T	P	
06BCS101	Operating Systems		3	1	0	4
06BCS102	Computer Networks		3	0	0	3
06BCS103	Design & Analysis of Algorithms		3	0	0	3
06BCS104	Embedded Systems		3	0	0	3
06BCS105	Theory Of Computation		3	1	0	4
06BCS106	Electives (Any one of the following)		3	0	0	3
	1	Digital Signal Processing				
	2	Advanced Software Engineering				
	3	Microwave and Satellite Communication				
06BCS201	Shell Programming Lab		0	0	3	2
06BCS202	Network lab		0	0	3	2
06BCS203	Web Programming lab		0	0	3	2
06BCS204	Microcontroller lab		0	0	3	2
06BCS301	Discipline & Extra Curricular Activities		0	0	14	1
TOTAL			**18**	**2**	**16**	**29**

SEMESTER VII

Subject Code	Name of Subject	TEACHING HOURS			CREDIT POINT
		L	T	P	
07BCS101	Compiler Construction	3	0	0	3
07BCS102	Data Mining And Ware Housing	3	0	0	3
07BCS103	Logic Synthesis	3	0	0	3
07BCS104	Artificial Intelligence	3	0	0	3
07BCS105	Multimedia Systems	3	0	0	3
07BCS106	Electives (Any one of the following) 1 Service Oriented Architectures 2 Optical Communication 3 Real Time Systems	3	0	0	3
07BMD101	Principles and Practice of Management	3	0	0	3
07BMD102	Managerial Economics	3	0	0	3
07BMD103	International Business Management	3	0	0	3
07BCS201	Compiler Design Lab	0	0	3	2
07BCS202	Data Mining And Ware Housing Lab	0	0	3	2
07BCS203	Logic Synthesis Lab	0	0	3	2
07BCS204	Project Stage I	0	0	2	1
07BCS205	Practical Training Seminar	0	0	3	2
07BCS301	Discipline & Extra Curricular Activities	0	0	4	1
TOTAL		**27**	**0**	**18**	**37**

SEMESTER VIII

Subject Code	Name of Subject	TEACHING HOURS			CREDIT POINT
		L	T	P	
08BCS101	Information System and Securities	3	1	0	4
08BCS102	CAD FOR VLSI Design	3	1	0	4
08BCS103	Advanced computer Architectures	3	1	0	4
08BCS104	Electives (Any one of the following) 1 Distributed Systems 2 Image Processing 3 Natural Language Processing	3	1	0	4
08BMD101	Human Resource Management	3	0	0	3
08BMD102	Marketing Management	3	0	0	3
08BMD103	Financial Management	3	0	0	3
08BMD104	Management Information system	3	0	0	3
08BCS201	Information System and Securities	0	0	3	2
08BCS202	VLSI Design Lab	0	0	3	2
08BCS203	X-Windows Programming Lab	0	0	3	2
08BCS204	Project Stage II	0	0	6	3
08BCS205	Seminar Presentation	0	0	3	2
08BCS301	Discipline & Extra Curricular Activities	0	0	4	1
TOTAL		**24**	**4**	**22**	**40**

SEMESTER IX

Subject Code		Name of Subject	Teaching Period			Credits
			L	T	P	
Compulsory Papers						
09BMD101		Business Policy & strategic Management	4	0	0	4
09BMD102		Operation & Product Management	4	0	0	4
09BMD103		Research Methods in Management	4	0	0	4
09BMD104		Summer Training & Project Management	3	0	0	3
Optional Papers (Major)-V						
(Finance)	09BMD105	International Financial Management	4	1	0	4
(Marketing)	09BMD106	International Marketing	4	1	0	5
(Human Resource)	09BMD107	Strategic Human Resource Management	4	1	0	5
Optional Papers (Major)-VI						
(Finance)	09BMD108	Investment Management & Security Analysis	4	1	0	5
Marketing)	09BMD109	Advertisement Management	4	1	0	5
Human Resource)	09BMD110	Training & development	4	1	0	5
Optional Paper (Minor) VII Ist paper of other two group (Not of Major Group selected**)**			4	0	0	5
09BMD301		Discipline & Extra Curricular Activities	0	0	0	1
			30	0	0	30

NOTE:-

- **In IX Semester student has to study all compulsory paper, two major optional paper & one minor paper)**
- **Optional minor papers (Marketing/H.R./ Finance) will be Ist paper of other two group. (Not of Major Group selected)**
- **Major paper could be obtain from any group (i.e. a group A/B/C)**
- **A student has to select minor paper from the group A/B/C for the respective semester.**

Semester X

Subject Code	Name of Subject	Teaching Period			Credits
		L	T	P	
Compulsory Paper					
10 BMD101	Social Responsibility & Business Ethics & Law	4	0	0	4
10 BMD102	Project Management	4	0	0	4
Major Optional Paper III					
10 BMD103(Finance) 10 BMD104(Marketing) 10 BMD105(Human Resource)	Management of Financial Services Sales & Distribution Management Leadership Skill & Change Management	4	1	0	5
Major Optional Paper IV					
10 BMD106(Finance) 10 BMD107(Marketing) 10 BMD108(Human Resource)	Finance For Strategic Decisions Product & Brand Management Human Resource Planning	4	1	0	5
Major Optional Paper V					
10 BMD109(Finance) 10 BMD110(Marketing) 10 BMD111(Human Resource)	Banking Services & Operation Marketing of Services Performance Management & Retention Strategies	4	1	0	5
Optional Minor Paper Ist paper of other two group (Not of Major Group selected)		4	1	0	5
10BMD301	Discipline & Extra Curricular Activities	0	0	2	1
Total		**24**	**4**	**2**	**29**

Note

- **In X semester student has to study two compulsory papers, three major optional papers, and one minor paper.**
- **Optional Minor paper (Marketing/H.R./Finance) will be Ist paper of other two group (Not of Major Group selected)**

III SEMESTER

DIGITAL ELECTRONICS

Course/Paper: 03BCS-101
BCS Semester III

Unit	Content
I	Number systems, Coding Schemes: BCD, Excess-3, Grey, r's and (r-l)'s complement. Boolean Algebra, Fundamental theorems, Simplifications of Boolean expressions. Logic gates and their truth table. Gate implementation and Truth table of Boolean functions.
II	Standard forms of Boolean functions. Minterm and Maxterm designation of functions. Simplification of functions on Karnaugh maps, Incompletely specified functions. Cubical representation of Boolean functions and determination of prime implicants. Selection of an optimal set of prime implicants. Multiple output circuits and map minimization of multiple output circuits. Tabular determination of multiple output prime implicants.
III	Combinational circuits – Adder, subtractor, encoder, decoder, multiplexer. Design of Combinational circuit using Multiplexers.
IV	Flip Flops: RS, J-K, D, T. Sequential circuits. Clock, pulse and level mode sequential circuits. Analysis and design of sequential circuits. Synthesis of state diagrams, Finite memory circuits, equivalence relations equivalent states and circuits, determination of classes of indistinguishable states and simplification by implicants tables. Mealy and Moore machines, state assignment and memory element input equations, Partitioning and state assignment.
V	Switching Devices. Positive and Negative logic of OR, AND, NOR, NAND, XOR and XNOR gates. Logic Family: RTL, DTL, DCTL, TTL, RCTL, ECL, HTL, MOS and CMOS logic circuit. Speed and delay in logic circuits, integrated circuit logic and noise immunity.

References:

1. Albert Paul Malvino and Donald P. Leach, Digital Principles and Applications, (Fourth Edition) Tata Graw Hill Publishing Company Ltd, New Delhi.
2. S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, Vikas Publishing House Pvt. Ltd.
3. R.P. Jain, Modern Digital Electronic, Tata Mc Graw Hill Publishing Company Ltd. New Delhi.
4. Adel S. Se&a, and Kanneth C. Smith, Microelectronic Circuits, Oxford University Press

ELECTRONIC DEVICES & CIRCUITS

Course/Paper: 03BCS-102
BCS Semester III

Unit	Content
I	Diode circuits: Diode as a circuit. Element, load line concept, clipping & clamping circuits, voltages multipliers.

II	Devices: construction, characteristics and working principles of the following devices. Diodes, BJT, JFET, MOSFET, UJT, photo diodes, LEDs, photo transistors. Solar cells. Thermistor, LDR.
III	Transistors: transistor characteristics, current components, current gains. Alpha and vita. Operating point. High bride model, h- parameter equivalent circuits. Ce, Cb and Cc configuration. Dc and ac analysis of Ce, Cc and Cb amplifiers. Evers- moll model. Biasing and stabilization techniques. Thermal run away, thermal stability. Equivalent circuits and blessing of JFETs and MOSFETs. Low frequency Cs and Cd JFET amplifiers. FET as a voltage variable resistor.
IV	Small signal amplifiers at low frequency: analysis of BJT and FET, dc and rc coupled amplifiers. Frequency response, mid band gain, gains at low and high frequency. Analysis of dc and differential amplifiers, Mil ers' Theorem. Cascading transistor amplifiers, Darlington and cascaded circuits. Emitter and source followers.
V	Oscillators: concept of feedback classification, criterion for oscillation. Tuned collector, Hartley, Colpitts , rc-phase shift , Wein bridge and crystal oscil ators, astable, monostable and bistable multivibrators . Schmitt trigger.

References:

1. J. Millman & C.C. Halkias: Integrated Electronics, Tata Mc-Graw Hill Publishing Ltd., New Delhi Mc-Graw Hill.
2. Millman Grabel –Micro electronica, Mc-Graw Hill.
3. Robert Boylestand & L.Nashelsky Electronic devices & circui theory.
4. Sedra Smith- Microelectronic Circuits, Oxford Press, India.

DATA STRUCTURE AND ALGORITHMS

Course/Paper:03BCS-103
BCS Semester III

Unit	Content
I	Data Structure: Definition, Implementation, Operation, Application, Algorithm writing and convention. Analysis of algorithm, Complexity Measures and Notations. Arrays: Representation of arrays (multidimensional), Address calculation using column and row major ordering. Linked Lists : Implementation, Doubly linked list, Circular linked list, unrolled linked list, skip-lists, Splices, Sentinel nodes, Application (Sparse Matrix, Associative Array, Functional Programming)
II	Stacks : Definition, Implementation, Application (Tower of Hanoi, Function Call and return, Parentheses Matching, Back-tracking, Expression Evaluation) Queues : Definition, deque, enque, priority queue, bounded queue, Implementation, Application
III	Tree: Definition of elements, Binary trees: Types (Full, Complete, Almost complete), Binary Search Tree, Traversal (Pre, In, Post & Level order), Pruning, Grafting. Application: Arithmetic Expressions Evaluation Variations: Indexed Binary Tree, Threaded Binary Tree, AVL tree, Multi-way trees, B tree, B+ tree, Forest, Trie and Dictionary
IV	Graphs: Elementary definition, Representation (Adjacency Matrix, Adjacency Lists) Traversal (BFS, DFS)Application: Spanning Tree (Prim and Kruskal Algorithm), Dijkstra's algorithm, and Shortest path algorithms.
V	Sorting: Bubble, Selection, Insertion, Quick, Radix, Merge, Bucket and Heap sorts. Searching: Hashing, Symbol Table, Binary Search, Simple String Searching.

References:

1. Aho A.V & Ullman J.E. : Data Structure & Algorithms.
2. Aron M. Tannenbaum & Others: Data Stmctures usmg C, Prentice Hall, 1992 ,
3. Mary E.S. Loomis: Data Management & File Structure, PHI, 1991.
4. Bhagat Singh & Thomas Naps: Introduction to Data Structure
5. Trembley & Sorenson: An Introduction to Data Structure with Application, McGraw-Hill, 1984.
6. Ellis Horowiz and Sartaj Sahani : Fundamentals of data structure with Pascal. Galgotia Book Source, 1994.

DISCRETE MATHEMATICAL STRUCTURES

Course/Paper: 03BCS-104
BCS Semester III

Unit	Content
I	Formal Logic: Statement, Symbolic Representation and Tautologies, Quantifiers, Predicator and validity, Normal form. Propositional Logic, Predicate Logic, Logic Programming and Proof of correctness.
II	Proof, Relation and Analysis of Algorithm Techniques for theorem proving: Direct Proof, Proof by Contra position, Proof by exhausting cares and proof by contradiction, principle of mathematical induction, principle of complete induction. Recursive definitions, solution methods for linear, first-order recurrence relations with constant coefficients.
III	Graph Theory: Graphs - Directed and Undirected, Eulerian chains and cycles Hamiltonian chains and cycles, Trees, chromatic number, connectivity and other graphical parameters Applications. Polya's Theory of enumeration and its applications.
IV	Sets and Functions: Sets, relations, functions, operations, equivalence relations, relation of partial order, partitions, binary relations. Transforms: Discrete Fourier and Inverse Fourier Transforms in one and two dimensions, discrete Cosine transform.
V	Monoids and Groups: Groups, Semi groups and Monoids cyclic semi graphs and sub monoids, Subgroups and cosets. Congruence relations on semi groups. Morphism, Normal sub groups. Structure off cyclic groups, permutation groups and dihedral groups elementary applications in coding theory.

References:

1. C.l.Liu ; elements of Discrete Mathematics Tata McGraw Hill publishing Company Ltd., 2000
2. Richard johnsonbaugh disvrete mathematics prearson Asia 2001 .
3. John Truss : Discrete Mathematics for Computer Scientists, Pearson Education, Asia, 2001.
4. Robert J.Mc Eliece : Introduction to Discrete Mathematics, Tata Mc. Graw Hill, India.
5. Lipschutz : Discrete Mathematics, Tata Mc. Graw Hill India.
6. Kenneth H. Rosen, Discrete mathematics and Applications, Tata Mc. Graw Hill, India.

MATHEMATICS III

Course/Paper: 03BCS-105
BCS Semester III

Unit	Content
I	Introduction: Engineering application of optimization, Statement and classification of optimization problem, single variable and multivariable optimization with and without constraints.
II	Linear Programming: Formulation of Linear Programming problem, Graphical Approach, General Linear Programming problem, Simple Method. Duality in Linear Programming and Transportation Problems.
III	Project Scheduling: Project Scheduling by PERT and CPM Network Analysis. Sequencing Theory: General Sequencing problem n-jobs through 2 machines & 3 machines and 2-jobs through m machine.
IV	Transform Calculus – Laplace Transform with its simple properties, applications to the solution of ordinary and partial differential equation having constant coefficients with special reference to the wave and diffusion equation. Fourier transforms and solution of particular differential equation with constant coefficient.

V	Numerical Methods – Solution of Algebraic and transcendental equations, interpolation- finite differences, inverse interpolation, numerical differentiation and integration, numerical solution of differential equations and partial differential equations, solution of difference equation.

Reference:

1.Gokhroo et al:Higher Engg mathematics-III.
2. Schaums outline series on Matrix Algebra.
3. Grewal- Maths for Engineers.
4. R.K. Jain & S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publication House, 2002.
5. Chandrika Prasad, Advanced Mathematics for Engineers, Prasad Mudralaya, 1996

ELECTIVE:-

INTELLECTUAL PROPERTY RIGHTS

Course/Paper: 03BCS-106.1
BCS Semester III

Unit	Content
I	Basic Concepts of Intellectual Property: Introduction to intellectual property rights, Intellectual property laws and the Internet, Trade Related Aspects of Intellectual Property Rights
II	Patents: Introduction to patent law and conditions for patentability, Procedure for obtaining patents, Rights of a patentee, Patent infringements, Biotechnology patents and patents on computer programs, Patents from an international perspective
III	Trademark and Geographical Indications: Statutory authorities and registration procedure, Rights conferred by registration, Licensing, assignment and transfer of trademark rights, Trademark infringement, Geographical Indication of Goods & Appellations of Origin
IV	Copyright: Registration procedure and copyright authorities, Assignment and transfer of copyright, Copyright infringement and exceptions to infringement, Software copyright
V	Designs: Introduction to the law on Industrial Designs, Registration and piracy, International perspective, Introduction to the law on semiconductor layout design, Registration, commercial exploitation and infringement

INTERNET TECHNOLOGY

Course/Paper: 03BCS-106.2
BCS Semester III

Unit	Contents
I	INTRODUCTION : Internet connection concepts- server, client and parts, Domain Name Systems, Telephone, cable and satellite connections- Dialup, ISDN, ADSL and leased line based connection, cable and DSS accounts,Web TV and Intranets, ISP features.
II	INTRANETS: What is Intranet? – Intranet Vs LANs Components of an Intranet Workstations and client software, Server and Network operating systems, Network Cards, Cabling and Hubs, Steps for creating an Intranet, Maintenance and connecting to Internet.
III	E-MAIL TECHNOLOGY: Features and Concepts- Message headers, Address book, Attachment, Filtering and forwarding mails.
IV	VIDEO CONFERENCING AND INTERNET TELEPHONY: Voice vs Video conferencing, Video conferencing hardware and features of video conferencing software, digital telephony as ISDN application, H 323 protocols and multi-point conferencing.

V	WEB TECHNOLOGY: Elements of the Web- Clients and servers, Languages and protocols Web page and Websites, special kinds of Web sites, Web Resources- Search Engines, Message boards, clubs, News groups and chat, Web page creation concepts- planning, Navigation, Themes and Publishing , Analyzing web traffic- Log file data, analyzing log files and products for analyzing web traffic

References:

1. Internet Technologies and Information Services (Library and Information Science Text Series) by Joseph B. Miller
2.The Internet Revolution: The Not-for-Dummies Guide to the History, Technology, and Use of the Internet by J. R. Okin
3.Understanding the Internet: A Clear Guide to Internet Technologies (Computer Weekly Professional Series) by Keith Sutherland
4.Internet Technologies at Work (Mike Meyers' Computer Skills) by Fred T. Hofstetter
5.Leonardo to the Internet: Technology and Culture from the Renaissance to the Present (Johns Hopkins Studies in the History of Technology) by Thomas J. Misa
6.Media Technology and Society: A History: From the Telegraph to the Internet by Brian Winston

MANAGEMENT INFORMATION SYSTEM

Course/Paper: 03BCS-106.3
BCS Semester III

Unit	Content
I	Introduction: MIS concept, Definition, role & Impact of MIS, Process of management, organization structure & behavior.
II	Basic of Management Information System: Decision Making, Information concepts, System concepts & control Types of system handling system complexity System development model.
III	Development of Management Information System: Requirement and implementation of MIS, Choice of information Technology for Management Information System.
IV	Application of Management Information system: Application in manufacturing sector using for personal management, Financial management, Production Management, Material Management, Marketing Management Application in Service Sector.
V	Enterprise Resource Planning (ERP): EMS, ERP, Benefits implementation, EMS & MIS. Case Studies: Application of SAP technologies in manufacturing sector.

References:

1. Murdick R. G., Ross JE. & Claggett J.R. : Information system for Modern Management, 3rd Edn.,PHI, 1997.
2. James A.O Brien: Management Information Systems, Galgotia Pubn., 1994.
3. Wigarders K, Svensson A., Sehong L. : Structured Analysis & Design of Information Systems, Mc Graw-Hill book Co. 1986.
4. Locus: Analysis, Design and Implementation of Information system, 3rd Edn., McGraw-Hili Book Co.
5. Jawedker: Information System for Management.
6. Anderson Lavid L., Post Gerald V. : Management Information System; Tat Mc Graw hilI, 3rd, 1999.

Laboratories:--

DIGITAL ELECTRONICS LAB

Course/Paper: 03BCS-201
BCS Semester III

1. Experimental study of characteristics of CMOS integrated circuits.

2. Interfacing of CMOS to TTL and CMOS.
3. Study of various combinatorial circuits based on: AND/NAND Logic blocks and OR/NOR Logic blocks.
4. Study of following combinational circuits: Multiplexer; Demultiplexer and Encoder. Verify truth tables of various logic functions.
5. To study various waveforms at different points of transistor bistable multi vibrator and its frequency variation with different parameters.
6. To study transistor astable multi vibrator.
7. To design a frequency driver using IC-555/timer.
8. To study Schmitt trigger circuit.
9. To study OP-AMP as Current to voltage and voltage to current converter comparator.
10. BCD to binary conversion on digital/IC trainer.
11. Study various Flip flops and construct Parallel-in-Serial-out register. Testing of digital IC by automatic digital IC trainer.

ELECTRONICS LAB

Course/Paper: 03BCS-202
BCS Semester III

1. Study the following devices:
   (a) Analog & digital multi meters
   (b) Function/Signal generators
   (c) Regulated D.C. power supplies (constant, voltage and constant current operations).
2. Study of analog CRO measurement of time period, amplitude, frequency and phase angle using issajous figures.
3. Application of diode as clipper and clamper.
4. Plot V-I characteristic of zener diode & study zener diode as voltage, reverse Saturation current and static & dynamic resistances.
5. Plot V-I characteristic of zener diode & study zener diode as voltage regulator. Observe the effect of load changes and determine load limits of the voltage regulator.
6. Plot frequency response curve for audio amplifier and to determine gain bandwidth product.
7. Plot drain current-drain voltage and drain current-gate bias characteristics of field effect transistor and measurement of I & VP.
8. Plot gain: frequency characteristic of two stages RC coupled amplifier and calculate its bandwidth and compare it with theoretical value.
9. Plot gain: frequency characteristic of two stages RC coupled amplifier and calculate its bandwidth and compare it with theoretical value.
10. Plot input and output characteristics of BJT in CB, CC and CE configurations. Find their h-parameters.
11. Study half wave rectifier and effect of filter network on D.C. voltage output and ripple factor.
12. Study bridge rectifier and measure the effect of filter network on D.C. voltage output and ripple factor.

DATA STRUCTURE LAB

Course/Paper: 03BCS-203
BCS Semester III

1. Program on array searching, sorting (Bubble sort, Quick sort, Marge sort etc.)
2. Program to insert element at desire position, replacing element, deletion in array.
3. Various matrices operations.
4. Various strings programs.
5. Implementation of stack and queue using array
6. Implementation of stack and queue using link lists
7. Implementation of circular queue using link lists.
8. Polynomial addition, multiplication.
9. Two-way link lists programs.
10. Infix to postfix/prefix conversion.
11. BST implementation (addition, deletion, searching).
12. Graph traversal (BF

HUMANITIES AND SOCIAL SCIENCES

Course/Paper: 03BCS-204
BCS Semester III

1. Form of Government: Democracy, Dictatorship
2. India: Brief history of Indian Constitution, History of Indian National Movement, After Independence, Socio-economic growth.
3. Society: Social groups-concept and types socialization: concept and types, theory social control concept and types means. Social problem: concept and types.
4. The Fundamentals of Economics: The logic of economics fundamentals definitions of economics, basic terminology.
5. Micro Economics: Consumer's behavior, utility, demand, supply, elasticity of demand and supply. Theory of production, production function, factors of production.
6. Macro Economics: National income, business cycles, aggregate term, inflation, economic growth, international Trade, exchange rates.
7. Indian Economy: Basic features, infrastructure, occupation, natural and human resources, unemployment (Industrial Sector, India and Globalization).

IV Semester

PRINCIPLES OF PROGRAMMING LANGUAGE

Course/Paper: 04BCS-101
BCS Semester IV

Unit	Content

I	Programming Language: Definition, History, Features. Issue in Language Design: Structure and Operation of computer, Language Paradigms. Efficiency, Regularity. Issues in Language Translation: Syntax, Semantics, Stages analysis and synthesis, Parse Tree, CFG and BNF grammar.
II	Specification and Implementation of Elementary and Structured Data Types. Type equivalence, checking and conversion. Array, List, Structure, Union.
III	Sequence control with Expressions, Conditional Statements, Loops, Exception handling. Subprogram definition and activation, simple and recursive subprogram, subprogram environment. Parameter passing mechanism.
IV	Abstract Data type, information hiding, encapsulation, type definition. Static and Stack-Based Storage management. Fixed and Variable size heap storage management. Garbage Collection
V	Parallel Programming: Introduction, parallel processing and programming language, Threads, semaphore, monitor, message passing.

References:

1. Robert W. Sebesta: Concepts of Programming Language, Addison Wesley, pearson Education Asia, 1999.
2. Ramon A. Mata-Toledo and Pauline K. Cushman: Introduction to Computer Science, Mc Graw Hill International Edition.
3. D. Appleby and JJ Vande Kopple: Programming Languages, Tata Mc Graw Hill, India.
4. Deitel and Deitel: How to Program C, Addison Wesley, Pearson Education Asia, 1999.
5. K.r. Venugopal, Rajkumar, T. Ravishankar: Mastering C++, Tata Mc Graw Hill, India.

MICROPROCESSOR AND INTERFACES

Course/Paper: 04BCS-102

BCS Semester IV

Unit	Content
I	Introduction to Micro Computer Systems: Microprocessors, microcontroller and microcomputer devices, Machine and assembly language, Bus concept. Architecture & Pinout of 8085A.
II	Assembly Language and Programming in 8085: Instruction set, Program structures (sequential, conditional, iterative), Macros and subroutines, Stack, Counter and timing delay, interrupt structure and its programming.
III	Peripherals and their interfacing with 8085-I: Memory Interfacing, Interfacing I/O ports, Data transfer schemes (Synchronous, asynchronous, interrupt driven), Architecture & interfacing of PPI 8255, Data Converters and Timer 8254.
IV	Peripherals and their interfacing with 8085-II: Architecture & interfacing of- DMA controller 8257, interrupt Controller 8259A, USART 8251, Level Converters MC 1488 and MC 1489, Current loop, RS 232 C and RS 422 A.
V	Comparative study of 8085 A, 8086 and 8088 (Pinout, internal architecture, timing diagrams), Instruction format and addressing modes – Data and Branch related. Features of Pentium processor, MMX and Dual core processor.

References:

1. Gaonkar: Microprocessor and its Applications..
2. Liu,Y,Gibson, G.A. : Microcomputer systems: The 8086/8088 family, Prentice-Hall, 2nd Edn. 1986.
3. Parson, AJ. : Microprocessors: Essential, Components and System, Galogtla Publ. Pvt. Ltd.

4. INTEL-Microcontroller handbook.
5. Ayle- 8051 Micro controller, penram press.

OBJECT ORIENTED PROGRAMMING

Course/Paper: 04BCS-103

BCS Semester IV

Unit	Content
I	Introduction to programming paradigm. Aspect-oriented programming, Dynamic programming, Functional programming, Logic programming, Object-oriented programming, Parallel computing, Event Driven Programming.
II	Overview of C++ (A): Abstraction, Polymorphism, Inheritance, Classes, Objects, Methods. Constructor, destructor
III	Overview of C++ (B) :Overloading (function and operator), references, friend function, overriding, virtual function, virtual classes, templates, Namespace, Nested and inner classes, Exception handling, Run time type casting, STL (List, Map, Algorithm)
IV	Overview of Java(A) : Java Byte code and virtual machine, data types, operators, arrays, Objects, constructors, returning and passing objects as parameter, Single and Multilevel inheritance, Extended Classes, Access Control, Usage of super, overloading and overriding methods, Abstract classes, Using final with inheritance.
V	Overview of Java (B): Package and interfaces, String Handling, String constructors, special string operations, character extraction searching and comparing strings, string Buffer class. Applet Fundamentals, Using paint method and drawing polygons.

References:

1. E Balaguruswamy: Object Oriented Programming with c++; Tata Mc Graw Hill.
2. Margaret Ellis; Bjarne Strousstrup : The annotated c++ reference manual.
3. Chirlian PM. : Programming inc++; Merril pub. Co.,1990.
4. James Rumbaugh etal, “Object Oriented Modeling and Design”, PHI
5. Herbert Schieldt, “The Complete Reference: Java”, TMH.

SYSTEM SOFTWARE

Course/Paper: 04BCS-104

BCS Semester IV

Unit	Content
I	Overview: Comparison of machine language, assembly language and high level languages, External and internal representation of instructions and data. Data allocation structures, search structures and addressing modes. Activities and system software for program generation, translation and execution. Editors for source code and object code/executable code files.
II	Assemblers: Assembly language specification. Machine dependent and independent features of assembler. Classification of assemblers. Pass structure of assemblers (problem and associated for IBM-PC.
III	Loader and Linkers: Functions and classification. Machine dependent and independent features of loaders, Design of bootstrap, absolute and relocatable loaders, Design of linker. Case study of MS-DOS linker.
IV	Macro processors: Macro definition, call and expansion. Macro processor algorithm and data structure. Machine independent features (parameters, unique labels, conditional expansion, nesting and recursion).Pass structure and design of microprocessor and macro assembler, Case study of MASM macro processor.
V	High level language processor: HLL specification: Grammars and parse trees, expression and precedence. Lexical analysis: Classification of tokens, scanning methods, character recognition, lexical ambiguity. Syntactic analysis: Operator precedence parsing, recursive descent parsing. Symbol Table Management: Data structure for symbol table, basing functions for symbols, overflow technique, block structure in symbol table.

References:

1. Andrew P. Sage and James D. Palmes: system software engineering
2. Leland L. Beck: an intro to system programming 3rd edition by hardcover
3. Nick Rozanski: software system architecture by kindle
4. Neetu Sharma and Amit Sharma : system software engineering
5. Vikas Thadda : system software engineering

STATISTICS AND PROBABILITY THEORY

Course/Paper: 04BCS-105
BCS Semester IV

Unit	Content
I	Introduction: Sample space, Events, Algebra of events, Bayes' Rule, Bernoulli Trials. Probability Distribution and Probability Densities: Bernoulli, Binomial, Poisson, Normal, rectangular and exponential distributions and their PDFs. Moments and MGFs for above distributions.
II	Discrete Random Variables: Random Variables and their event space, probability mass function. Distribution Functions. Probability Generating Function. Expectations: Moments, Computation of mean Time to failure. Bernoulli & Poisson Processes.
III	Queuing Theory: Pure birth, Pure Death and Birth-Death Processes, mathematical Models for M/M/I, M/M/N, M/M/S and M/M/S/N/ queues.
IV	Discrete Parameter Markov Chains: M/G/I Queuing Model, Discrete Parameter Birth-Death Process.
V	Network of queues: Open Queuing Networks. Correlation & Regression: Linear regression, Method of least squares, Normal regression and correlation Analysis.

References:

1). Dr. Jain, Dr. Mangal Maheshwari, Mr. Praveen Deora "Statistic and Probability Theory". Dhanpat Rai .
2). Jain and Rawat "SPT", CBC
3). Y.N. Gaur "Statistic and Probability Theory", Genius Pub.

ELECTIVE:--

OPEN SOURCE TECHNOLOGY

Course/Paper: 04BCS-106.1
BCS Semester IV

Unit	Content
I	OST overview: Evolution & development of OST and contemporary technologies, Factors leading to its growth. Open Source Initiative (OSI), Free Software Foundation and the GNU Project, principle and methodologies. Contexts OST (India & international). Applications of open source (open source teaching and open source media) Risk Factors. Myths regarding open source.
II	Philosophy of Software Freedom, Free Software, OSS, Closed software, Public Domain Software, Shared software, Shared source. Detail of few OSS like Open Audio, Video, 2d & 3d graphics software, system tools, office tools, Networking & internet, Security, Educational tools and Games.

III	Open Source Development Model, Starting and Maintaining an Open Source Project, Open Source Hardware, Open Source Design, Ongoing OS Projects (i.e. examples of few good upcoming software projects.) Case Study: - Linux, Wikipedia.
IV	Licenses and Patents: What Is A License, How to create your own Licenses? Important FOSS Licenses (Apache, BSD, GPL, LGPL), copyrights and copy lefts, Patents
V	Social and Financial impacts of open source technology, Economics of FOSS: Zero Marginal Cost, Income generation opportunities, Problems with traditional commercial software, Internationalization, Open Source as a Business Strategy.

References:

1. Open Source: Technology and Policy by Fadi P. Deek and James A. M. McHugh
2. Open Source Approaches in Spatial Data Handling (Advances in Geographic Information Science) by G. Brent Hall and Michael G. Leahy
3. Open Sources 2 by Chris Dibona, Danese Cooper, and Mark Stone
4. Understanding Open Source and Free Software Licensing by Andrew M. St. Laurent
5. Agile Technologies in Open Source Development (Premier Reference Source) by Barbara Russo, Marco Scotto, Alberto Sillitti, and Giancarlo Succi

E- COMMERCE

Course/Paper: 04BCS-106.2
BCS Semester IV

Unit	Content
I	Business Strategy in an Electronic Age: Value Chain-supply chains, Proter's value chain, model and Inter-Organizational value chains. Competitive Advantage-Competitive strategy, Proter's Model, First Mover advantage and competitive advantage using e-commerce Business strategy Introduction to Business Strategy, Strategic Implications of IT technology e-commerce Implementation and evaluation.
II	Business to Business Electronic Commerce: Inter-organizational Transactions, The credit Transaction Trade cycle. A variety of transactions, Electronic markets-markets and electronic markets, usage of electronic markets, Advantages and disadvantages of electronic markets.
III	Electronic Data Interchange (EDI): Definition and benefits of EDI. EDI technology, standards, communications, implementation, agreements and securities. EDI trading patterns and transactions.
IV	Building an E-Commerce Site: Introduction to object behavior, components, active scripting. Object models, Infrastructure objects, service object and data objects, choosing the objects. Building a scalable application, Addition the configure method, connecting to the database, Accessing and versioning the database. Building the catalog object with example. Creating shopping basket-Holding state, creating the tables for a shopping basket, modifying the object model and making the basket accessible.
V	J2EE Architecture Overview: Enterprise components, Information technology in the enterprises, introduction to enterprise objects and enterprise component model. The J2EE model features, J2EE components-container architecture. Enterprises Java and J2EE architecture.

References:

1. R David Whitely; Electronic Commerce Strategy, technology, Applications Tate McGraw Hill
2. Soka: From EDI to E-Commerce; McGraw Hill, 1995
3. Harley Hahn-The Internet Complete Reference Tate McGraw Hill
4. Concept of E-Commerce, Adash K.Pandey, S.K. Kataria & Sons
5. E-Commerce, J.S. Pilaniya, Genius Publications

ANALOG AND DIGITAL COMMUNICATION

Course/Paper: 04BCS-106.3
BCS Semester IV

Unit	Content
I	Modulation of Signals: Principles of Analog modulation technique like AM, FM, PM, SSB, Generation & detection. Frequency division multiplexer. Pulse modulation: Pulse transmission over band-limited signals, sampling theory, pulse amplitude modulation.
II	Digital Communication: PCM, DCSM, DM, ADM, comparison of above systems on the basis of performance criteria such as bit transmission, signaling rate, error probability, S/N ratio, bandwidth requirement. ISI & Eye diagram.
III	Digital Modulation technique: Data transmission using techniques such as PSK, FSK, QFSK (QAM), MSK Inter system comparison.
IV	Introduction to communication channel: Transmission line-primary and secondary line constant, telephone lines and cable, public switch telephone network (Electronic exchange). Introduction of fiber optic communication-Principle of light communication in fiber, losses in fiber, dispersion, light source and photo detector, connector and splicer.
V	Introduction to coding technique: Information theory, channel capacity, Shannon's theorem, source coding, error control coding, error detection and correction, block code, cycle code, line code channel throughput and efficiency.

References

1. H. TAFF & D.L SCHILLING- Principle of Communication System, TMH
2. G. Kennedy- Electronic Communication System, TMH
3. B.P. LATHI- Communication System, John Wiles
4. Sanjay Sharma- Analog and Digital Communication

Laboratories:--

COMMUNICATION LAB

Course/Paper: 04BCS-201
BCS Semester IV

1. Harmonic analysis of a square wave of modulated waveform

2. Observe the amplitude modulated waveform and measures modulation index. Demodulation of the AM signal

3. To modulate a high frequency carrier with sinusoidal signal to obtain FM signal. Demodulation of the FM signal

4. To observe the following in a transmission line demonstrator kit :

   i. The propagation of pulse in non-reflecting Transmission line.

   ii. The effect of losses in Transmission line.

   iii. The resonance characteristics of al half wavelength long x-mission line.

5. To study and observe the operation of a super heterodyne receiver

6. To modulate a pulse carrier with sinusoidal signal to obtain PWM signal and demodulate it.

7. To modulate a pulse carrier with sinusoidal signal to obtain PPM signal and demodulate it.

8. To observe pulse amplitude modulated waveform and its demodulation.

9. To observe the operation of a PCM encoder and decoder .To considers reason for using digital signal x-missions of analog signals.

10. Produce ASK signals, with and without carrier suppression, Examine the different processes required for demodulation in the two
cases.

11. To observe the FSK wave forms and demodulate the FSK signals based on the properties of (a) tuned circuits (b) on PI.L.

MICROPROCESSORS LAB

Course/Paper: 04BCS-202
BCS Semester IV

1. Study of hardware, functions, memory, and operations of 8085 kit.

2. Program to perform integer addition (two and three numbers 8 bit)

3. Program to perform multiplication (two 8 bit numbers).

4. Program to perform division (two 8 bit numbers).

5. Transfer of a block data in memory to another place in memory in forward and reverse order.

6. Swapping of two block data in memory.

7. Addition of 10 numbers using array.

8. Searching a number in an array.

9. Sorting of array (ascending, descending order).

10. Print Fibonacci sequence. (15 elements)

11. To insert a number at correct place in a sorted array.

12. Interfacing seven segment display using 8255.

OBJECT ORIENTED PROGRAMMING LAB

Course/Paper: 04BCS-203
BCS Semester IV

C++ Programs

1. Programs based on inheritance property.

2. Programs of operator overloading (complex number arithmetic, polar coordinates).

3. Programs using friend functions.

4. Programs on various matrix operations.

5. Stack operations using OOPs concepts.

6. To implement Tower of Hanoi problem.

JAVA Programs:-

7. To implement spell checker using dictionary.

8. To implement color selector from a given set of colors.

9. To implement shape selector from a given set of shapes.

10. To implement a calculator with its functionality.

11. To show movement of a car.

SYSTEM SOFTWARE LAB

Course/Paper: 04BCS-204
BCS Semester IV

In this lab we will practice how source code is processed by compiler/ assembler/ pre-processor.

All programs have to be written in C++

1. Write a class for file handling, having functions to open/ read/ write/ close/ reset.

(2-5) Develop a program which take input a file of C language

a. Print Lines of Codes and print signature of all function (including main)

b. Print number of variables in every function (with type)

c. Generate a new file without the comments. (/* */ and //)

d. Process all #define (i.e. #define MAX 100, than replace every occurrence of MAX with 100).

(Macro value 100 can be an expression also.)

6. Write a program to create a symbol table.

7. Write a program which can parse a given C file and store all variables and functions in symbol table.

(8-10). Write a program to convert given C program into RTL code.

Assumption

a. input C file will have only main function,

b. only two type of statements, either variable declaration statements

(int sub1=23;) OR mathematical expression (sub1=sub2-sub3;).

c. system have 16 registers (R1 to R16)

d. RTL opcode available are: ADD, LOAD, MOVE, SUB, MULTIPLY, DIVIDE

e. No control-flow (i.e. if-else, loop, jump etc.) expression is there in input code e.g.

```
int main()
{
int sub1=72, sub2=85, sub3=63;
float per;
per=(sub1+sub2+sub3)/(100+100+100);
}
```

V Semester

SOFTWARE ENGINEERING

Course/Paper: 05BCS-101
BCS Semester V

Unit	Content

I	System Analysis: Characteristics, Problems in system Development, System Level project Planning, System Development Life cycle (SDLC), computer system engineering system analysis, modeling the architecture, system specification.
II	Software Project Management: Objectives, Resources and their estimation, LOC and FP estimation, effort estimation, COCOMO estimation model, risk analysis, software project scheduling. Software Development : Life Cycle (SWDLC), SWDLC models software engineering approaches
III	Requirement Analysis: Requirement analysis tasks, Analysis principles. Software prototyping and specification data dictionary finite state machine (FSM) models. Structured Analysis: Data and control flow diagrams, control and process specification behavioral modeling, extension for data intensive applications.
IV	Software Design: Design fundamentals, Effective modular design: Data architectural and procedural design, design documentation.
V	Object Oriented Analysis: Object oriented Analysis Modeling, Data modeling. Object Oriented Design: OOD concepts and methods class and object definitions, refining operations. Class and object relationships, object modularization. Introduction to Unified Modeling Language

References:

1. Pressman Roger: Software Engineering -A Practitioner's Approach; Tata McGraw Hill, N.Delhi,-

1991-

2. Jalote Pankaj: An Integrated Approach to Software Engineering; Narosa, New delhi, 1991.

3. Fairley, R.E. : Software Engineering Concepts, McGraw-Hill,

4. Shooman, M. : Software Engineering, McGraw-Hill

5. Shere: Software Engineering & Management, Prectice-Hall.

COMPUTER ARCHITECTURE

Course/Paper: 05BCS-102
BCS Semester V

Unit	Content

I	REGISTER TRANSFER LANGUAGE: Data movement around registers. Data movement from/to memory, arithmetic and logic micro operations. Concept of bus and timing in register transfer.
II	CPU ORGANISATION: Addressing Modes, Instruction Format. CPU organization with large registers, stacks and handling of interrupts & subroutines Instruction pipelining
III	ARITHMETIC ALGORITHM: Array multiplier, Booth's algorithm. Addition subtraction for signed unsigned numbers and 2's complement numbers.
IV	MICROPROGRAMMED CONTROL UNIT : Basic organization of micro-programmed controller, Horizontal & Vertical formats, Address sequencer
V	MEMORY ORGANISATION: Concept of RAM/ROM, basic cell of RAM, Associative memory, Cache memory organization, Vertical memory organization. I/O ORGANISATION: Introduction to Peripherals & their interfacing. Strobe based and handshake-based communication, DMA based data transfer, I/O processor.

References:

1. M. Mano, "Computer System Architecture", PHI India Pvt. Ltd.
2. Tannenbaum, " Structured Computer Organization", PHI India Pvt. Ltd.
3. Stallings, "Computer Organization", PHI India Pvt. Ltd.
4. D.Sima, T. Fountain, P. Kacsuk. "Advance computer Architectures: A Design Space Approach", Addision Wesley, 1997.
5. M.J. Flynn, "Computer Architecture: Pipelined and Parallel Processor Design", Narosa Publishing House/Jones

DATABASE MANAGEMENT SYSTEMS

Course/Paper: 05BCS-103
BCS Semester V

Unit	Content
I	INTRODUCTION TO DATABASE SYSTEMS: Overview and History of DBMS. File System vs DBMS .Advantage of DBMS Describing and Storing Data in a DBMS. Queries in DBMS. Transaction management and Structure of a DBMS.
II	ENTITY RELATIONSHIP MODEL: Overview of Data Design Entities, Attributes and Entity Sets, Relationship and Relationship Sets. Features of the ER Model-Key Constraints, Participation Constraints, Weak Entities, Class Hierarchies, Aggregation, Conceptual Data Base, Design with ER Model-Entity vs Attribute, Entity vs Relationship Binary vs Ternary Relationship and Aggregation vs ternary Relationship Conceptual Design for a Large Enterprise.
III	RELATIONSHIP ALGEBRA AND CALCULUS**:** Relationship Algebra Selection and Projection, Set Operations, Renaming, Joints, Division, Relation Calculus, Expressive Power of Algebra and Calculus.
IV	SQL QUERIES PROGRAMMING AND TRIGGERS: The Forms of a Basic SQL Query, Union, Intersection and Except, Nested Queries ,Correlated Nested Queries, Set-Comparison Operations, Aggregate Operators, Null Values and Embedded SQL, Dynamic SQL, ODBC and JDBC, Triggers and Active Databases.
V	SCHEMA REFINEMENT AND NORMAL FORMS: Introductions to Schema Refinement, Functional Dependencies, Boyce-Codd Normal Forms, Third Normal Form, Normalization-Decomposition into BCNF Decomposition into 3-NF.

References:

1. Date C J, “An Introduction To Database System”, Addision Wesley
2. Korth, Silbertz, Sudarshan, “Database Concepts”, Mc Graw Hill
3. Bipin C. Desai, “An introduction to Database Systems”, Galgotia
4. F. H. Lochousky, DC Tsichritzis"DBMS" NewYork Academic Press
5. N. Goodman, V. Hadzilacos "Concurrency Control and Recovery in Data Base System" Addison Wesley.

COMPUTER GRAPHICS

Course/Paper: 05BCS-104

BCS Semester V

Unit	Content
I	Introduction to Raster scan displays, Storage tube displays, refreshing, flicking, interlacing, color monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball , tablets and joysticks, graphical input techniques, positioning techniques, rubber band techniques, dragging etc.
II	Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham’s Algorithm, Circle drawing, general method, symmetric DDA, Bresenham’s Algorithm, curves, parametric function, Beizier Method, Bsp- line Method.
III	2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen.
IV	Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.
V	Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia data and file formats, RTF, TIFF, MIDI, JPEG, DIB, MPEG, Multimedia Tools, Presentation tools, Authoring tools, presentation.

References:

1. Donald Hearn, M. Pauline Baker, “Computer Graphics”, Pearson
1. Rogers, "Procedural Elements of Computer Graphics", TMH
2. Asthana, Sinha, "Computer Graphics", Addison Wesley
3. Steven Harrington, "Computer Graphics", A Programming Approach

4. Udit Agarwal, “Computer Graphics”, S.K. Katariya.

TELECOMMUNICATION FUNDAMENTALS

Course/Paper: 05BCS-105
BCS Semester V

Unit	Content
I	Electromagnetic Spectrum, Frequency Spectrum-Bandwidth-Allocation, Time domain and Frequency domain analysis, Transmission media, , Twisted pair, UTP cables, Coaxial and optical fiber cables, wireless, microwave and satellite transmission, Transmission impairments. Serial and parallel transmission, Simplex, half duplex or full duplex transmission mode. Network, LAN, MAN, WAN, Internet, Intranet, Extranet, Network Topology, Protocols, Layered Architecture, OSI and TCP/P protocol Architecture.
II	Physical Layer : Convention and terminology (bit rate, channel capacity, bandwidth, Signal strength, SNR) Physical transmission media interface(Mechanical, Electrical and Radio interface specification) Modulation (ASK, FSK and PSK, PCM, PAM, Delta Modulations), Line coding (NRZ-L, NRZ–I , Bipolar AMI, Manchester and differential Manchester), Multiplexing (FDM, Synchronous and Statistical TDM) Brief Introduction to Ethernet, SONET/SDH.
III	Data Link Layer: Channel allocation problem, pure and slotted ALOHA Protocols, Persisted And Non-Persisted CSMA, Collision Free Protocols, Digital Cellular Radio and CDMA. Logical Link Sub Layer, MAC Sub layer. Brief Introduction: Frame Relay, PPP.
IV	Switching Networks: Circuit switching Networks, Space and Time division switching, Routing circuit switched networks, control signaling packet switching principles, fixed, flooding and adaptive routing strategies, Brief Introduction: Broadband and Narrowband ISDN, ADSL.
V	Network Devices: Gateway, Router, Bridge, Switch, Hub, Repeater, Multilayer Switch, Protocol Converter, Router, Proxy, Firewall, Multiplexer, Network Card, Modem. Network Technology: DSL, GSM, Bluetooth, Infrared. Brief Introduction to Servers : File Server, Print Server, Mail Server, Proxy Server, Remote Access Server (RAS), Application Server, Web Server, Backup Server

References:
1. William Stallings, “Data and Computer communication”(PHI,5edi)
2. James Martin, “Telecommunication and the computer”-(PHI ,3edi)
3. A.S.Tanenbaum, “computer networks”-(PHI 3 edi)
4. R.P.Yadav , “Telecommunication Engg Fundamentals” , Genius Publications.
5. T. Vishwanathan, “Telecommunication switching system & Network”, PHI
ELECTIVE:--

LOGICAL AND FUNCTIONAL PROGRAMMING

Course/Paper: 05BCS-106.1
BCS Semester V

Unit	Content
I	PROPOSITIONS: Fully parenthesized propositions, Evaluation of constant propositions, Evaluation of proposition in a state. Precedence rules for operators, Tautologies, Propositions a sets of states and Transforming English to prepositional form.

II	REASONING USING EQUIVALENCE TRANSFORMATIONS: The laws of equivalence, rules of substitution and transitivity, formal system of axioms and Inference rules. NATURAL DEDUCTION SYSTEM: Introduction to deductive proofs, Inference rules, proofs and sub-proofs, adding flexibility to the natural deduction system and developing natural deduction system proofs.
III	PREDICATES: Extending the range of a state, Quantification, Free and Bound Identifiers, Textual substitution, Quantification over other ranges and some theorems about textual substitution and states.
IV	LOGIC PROGRAMMING: Introduction to prepositional and predicate calculus, First-order predicate calculus, Format logical systems, PROLOG programming-Facts, Rules and queries, Implementations, Applications, Strengths and Weaknesses.
V	FUNCTIONAL PROGRAMMING: Introduction to lambda calculus-Syntax and semantics, Computability and correctness. Features of Functional Languages-Composition of functions, Functions as first-class Objects, no side effects and clean semantics, LISP Programming-Data types and structures, Scheme dialect, primitive functions, functions for constructing functions and functional forms. Applications of functional languages and comparison of functional and imperative languages.

Reference:

1. Foundations of Logic and Functional Programming: Workshop, Trento, Italy, December 15-19, 1986. Proceedings (Lecture Notes in Computer Science) by Mauro Boscarol, Luigia Carlucci Aiello, and Giorgio Levi
2. Second Fuji International Workshop on Functional and Logic Programming: Shonan Village Center, Japan Nov 1996 by Tetsuo Ida, Atsushi Ohori, and Masato Takeichi
3. Functional and Logic Programming: 8th International Symposium, FLOPS 2006, Fuji-Susono, Japan, April 24-26, 2006, Proceedings (Lecture Notes in Computer Science / Programming and Software Engineering) by Masami Hagiya and Philip Wadler

INFORMATION THEORY & CODING

Course/Paper: 05BCS-106.2
BCS Semester V

Unit	Content
I	Elements Of Information Theory: Measure of information, average information, entropy, information rate. Communication channel, discrete and continuous channel
II	Shannon-Hartley theorem and its implications. Channel capacity, Gaussian channel and bandwidth-S/N tradeoff.
III	Introduction of Coding: types of efforts, types of codes, error control coding, methods of controlling errors
IV	Linear Block and Binary Cyclic Codes: matrix decryption of linear block codes, error detection and error correction capabilities of linear block codes. Hamming codes, structure of cyclic codes, encoding using an (n-k) bit shift register syndrome calculation, its error detection & correction, special classes of cyclic codes bch.
V	Burst and Convolution Codes: burst and random error correcting codes, encoders for convolution codes. Decoders for convolution codes

Reference:

1. Coding and Information Theory (Graduate Texts in Mathematics) by Steven Roman
2. Information and Coding Theory (Springer Undergraduate Mathematics Series) by Gareth A. Jones and J. Mary Jones
3. Information Theory and Network Coding (Information Technology: Transmission, Processing and Storage) by Raymond W. Yeung
4. Fundamentals of Information Theory and Coding Design (Discrete Mathematics and Its Applications) by Roberto Togneri and Christopher J.S deSilva
5. Anoop Singh Poonia, "Information Theory of Coding", Genius Pub.

ADVANCED DATA STRUCTURES

Course/Paper: 05BCS-106.3
BCS Semester V

Unit	Content
I	ADVANCED TREES: Definitions Operations on Weight Balanced Trees (Huffman Trees), 2-3 Trees and Red- Black Trees. Augmenting Red-Black Trees to Dynamic Order Statistics and Interval Tree Applications. Operations on Disjoint sets and its union-find problem Implementing Sets. Dictionaries, Priority Queues and Concatenable Queues using 2-3 Trees.
II	MERGEABLE HEAPS: Merge able Heap Operations, Binomial Trees Implementing Binomial Heaps and its Operations, 2-3-4. Trees and 2-3-4 Heaps. Amortization analysis and Potential Function of Fibonacci Heap Implementing Fibonacci Heap. SORTING NETWORK: Comparison network, zero-one principle, bitonic sorting and merging network sorter.
III	GRAPH THEORY DEFINITIONS: Definitions of Isomorphic Components. Circuits, Fundamental Circuits, Cut-sets. Cut-Vertices Planer and Dual graphs, Spanning Trees, Kuratovski's two Graphs.
IV	GRAPH THEORY ALGORITHMS: Algorithms for Connectedness, Finding all Spanning Trees in a Weighted Graph and Planarity Testing, Breadth First and Depth First Search, Topological Sort, Strongly Connected Components and Articulation Point. Single Min-Cut Max-Flow theorem of Network Flows. Ford-Fulkerson Max Flow Algorithms
V	NUMBER THEORITIC ALGORITHM: Number theoretic notation, Division theorem, GCD recursion, Modular arithmetic, Solving Linear equation, Chinese remainder theorem, power of an element, RSA public key Crypto system, primality Testing and Integer Factorization.

References:
1. **Coreman, Rivest, Lisserson**, : "Algorithm", **PHI.**
2. Motwani and Raghavan "Randomized Algorithms", Cambridge University Press
3. Preparata and Shamos "Computational Geometry", Springer Verlag
4. Mehlhorn "Data Structures and Algorithms: 1, Searching and Sorting", Springer Verlag EATCP
5. Monograph on Theoretical Computer Science
Laboratories:--

SOFTWARE ENGINEERING LAB

Course/Paper: 05BCS-201
BCS Semester V

In this lab first 8 experiments are to practice software engineering techniques. Use any open source CASE tool. Many of them are available at www.sourceforge.net. You can choose any other CASE tool, as per choice.

Language : C++ / JAVA Design Approach : Object Oriented

These designing can be done on any automation system e.g. library management system, billing system, payroll system, bus reservation system, gas agency management system, book-shop management system, students management system.

1. Do a feasibility study
2. Document all the requirements as specified by customer in Software Requirement Specification
3. Design sequence diagrams for project
4. Design Collaboration diagram
5. Design Data Flow Diagram for the project
6. Design Entity Relation Diagram for the project
7. Design Class diagram
8. Design at least 10 test cases for each module.
9. -10: Code and test the project, which you have designed in last 8 labs.

COMPUTER ARCHITECTURE LAB

Course/Paper: 05BCS-202
BCS Semester V

This lab will be based on assembly programming on of RISC processor simulator SPIM. SPIM simulator is available at site http://pages.cs.wisc.edu/~larus/spim.html.

SPIM exercises

1. Read an integer from the keyboard and print it out if (n => n_min AND n <= n_max).
2. Read an integer from the keyboard and print out the following as per switch-case statement

    Switch (n)
    { n <= 10 print "not a lot"
    n == 12 print "a dozen"
    n == 13 print "a baker's dozen"
    n == 20 print "a score"
    n >= 100 print "lots and lots"
    n != 42 print "integer"
    Otherwise print "you have the answer!"

3. Read a string from the keyboard and count the number of letters. Use the equivalent of following for loop to count number of chars.

    for (s1=0; str[s1] != '\n'; ++s1)

4. Print out a line of characters using simple procedure call.
5. Print out a triangle of characters using recursive procedure call.
6. Print factorial of a number using recursion.

7. Print reverse string after reading from keyboard.

8. Print a string after swapping case of each letter.

9. Print an integer in binary and hex.

10. Implement bubble sort algorithm.

11. Print Pascal Triangle of base size 12.

12. Evaluate and print Ackerman function.

DATABASE MANAGEMENT LAB

Course/Paper: 05BCS-203
BCS Semester V

Student can use My Sql (preferred open source DBMS) or any other Commercial DBMS tool (MS-Access / ORACLE) at backend and C++ (preferred) VB/JAVA at front end.

1. (a) Write a C++ program to store students records (roll no, name, father name) of a class using file handling.

(Using C++ and File handling).

(b) Re-write program 1, using any DBMS and any compatible language.(C++/MySQL) (VB and MS-Access)

2. Database creation/ deletion, table creation/ deletion.

(a) Write a program to take a string as input from user. Create a database of same name. Now ask user to input two more string, create two tables of these names in above database.

(b) Write a program, which ask user to enter database name and table name to delete. If database exist and table exist then delete that table.

3. Write a program, which ask user to enter a valid SQL query and display the result of that query.

4. Write a program in C++ to parse the user entered query and check the validity of query.
(Only SELECT query with WHERE clause)

5 - 6. Create a database db1, having two tables t1 (id, name, age) and t2 (id, subject, marks).

(a) Write a query to display name and age of given id (id should be asked as input).

(b) Write a query to display average age of all students.

(c) Write a query to display mark-sheet of any student (whose id is given as input).

(d) Display list of all students sorted by the total marks in all subjects.

7 - 8. Design a Loan Approval and Repayment System to handle Customer's Application for Loan and handle loan repayments by depositing installments and reducing balances.

9 -10. Design a Video Library Management System for managing issue and return of Video tapes/CD and manage customer's queries.

COMPUTER GRAPHICS LAB

Course/Paper: 05BCS-204
BCS Semester V

1. Implementation of line generation using slope's method, DDA and Bresenham's algorithms.

2. Implementation of circle generation using Mid-point method and Bresenham's algorithm.

3. Implementation of ellipse generation using Mid-point method.

4. Implementation of polygon filling using Flood-fill, Boundary-fill and Scan-line algorithms.

5. Implementation of 2D transformation: Translation, Scaling, Rotation, Mirror Reflection and Shearing (write a
menu driven program).

6. Implementation of Line Clipping using Cohen-Sutherland algorithm and Bisection Method.

7. Implementation of Polygon Clipping using Sutherland-Hodgman algorithm.

8. Implementation of 3D geometric transformations: Translation, Scalind and rotation.

9. Implementation of Curve generation using Interpolation methods.

10. Implementation of Curve generation using B-spline and Bezier curves.

11. Implementation of any one of Back face removal algorithms such as Depth-Buffer algorithm, Painter's
algorithm, Warnock's algorithm, Scan-line algorithm)

VI semester

OPERATING SYSTEMS

Course/Paper: 06BCS-101
BCS Semester VI

Unit	Content
I	Introduction to Operating Systems, Operating system services, multiprogramming, time-sharing system, storage structures, system calls, multiprocessor system. Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling I/0 devices organization, I/0 devices organization, I/0 devices organization, I/0 buffering.
II	Process concept, process scheduling, operations on processes, threads, inter-process communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization. Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling.
III	Concepts of memory management, logical and physical address space, swapping, contiguous and non-contiguous allocation, paging, segmentation, and paging combined with segmentation.
IV	Concepts of virtual memory, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation. Security threads protection intruders-Viruses-trusted system.
V	Disk scheduling, file concepts, file access methods, allocation methods, directory systems, file protection, introduction to distributed systems and parallel processing case study.

References:

1. **Milenekovie**, "Operating System Concept", **TMH.**
2. **Petersons**, "Operating Systems", **Addision Wesley**.
3. **Tannenbaum**, "Operating System Design and Implementation", **PHI.**
4. **Gary Nutt**, "Operating System, A Modern Perspective", **Addision Wesley**.
5. **Silveschatza, Peterson J**, "Operating System Concepts", **Willey**.

COMPUTER NETWORKS

Course/Paper: 06BCS-102
BCS Semester VI

Unit	Content
I	Network, Network Protocols, Edge, Access Networks and Physical Media, Protocol Layers and their services models, Internet Backbones, NAP's and ISPs.
II	Application Layer: Protocol and Service Provided by application layer, transport protocols. The world wide web. HTTP, Message formats, User Server Interaction and Web caches. FTP commands and replies. Electronic Mail, SMTP, Mail Message Formats and MIME and Mail Access Protocols DNS The internet's directory service DNS records and Message.
III	Transport Layer: Transport Layer Service and Principles, Multiplexing and De multiplexing applications, connectionless Transport. UDP Segment structure and UDP Checksum. Principles of Reliable Data Transfer-Go back to N and Selective Repeat. Connection Oriented Transport TCP Connection and Segment Structure, Sequence Numbers and acknowledgement numbers, Telnet, Round trip time and timeout. TCP connection management.
IV	Network Layer and Routing: Network service model, Routing principles. Link State routing Algorithm, A distant Vector routing & OSPF algorithm. Router Components; Input Prot, Switching fabric and output port. IPV6 Packet format. Point To Point Protocol (PPP), transition States, PPP Layers-Physical Layer and Data Link Layer, Link Control Protocols. LCP Packets and options. Authentication PAP and CHAP, Network Control Protocol (NCP).
V	Sonet/SDH: Synchronous Transport Signals. Physical configuration-SONET Devices, Sections, Lines and Paths. SONET Layers-Photonic Layer, section layer, line layer, path layer and device layer relationship. Sonet Frame format. Section overhead, Line overhead and path overhead. Virtual Tributaries and types of VTs.

References:

1. **Forouzen**, "Data Communication and Networking", **TMH**
2. **A.S. Tanenbaum**, “Computer Networks”, 3rd Edition, **PHI**
3. **S. Keshav**, “An Engineering Approach on Computer Networking”, **Addison Wesley**
4. **W. Stallings**, “Data and Computer Communication”, **Macmillan Press**

DESIGN & ANALYSIS OF ALGORITHMS

Course/Paper: 06BCS-103
BCS Semester VI

Unit	Content

I	BACKGROUND: Review of Algorithm Complexity and Order Notations and Sorting Methods. DIVIDE AND CONQUER METHOD: Binary Search, Merge Sort, Quick sort and strassen's matrix multiplication algorithms. GREEDY METHOD: Knapsack Problem, Job Sequencing, Optimal Merge Patterns and Minimal Spanning Trees.
II	DYNAMIC PROGRAMMING: Matrix Chain Multiplication. Longest Common Subsequence and 0/1 Knapsack Problem. BRANCH AND BOUND: Traveling Salesman Problem and Lower Bound Theory. Backtracking Algorithms and queens problem.
III	PATTERN MATCHING ALGORITHMS: Naïve and Rabin Karp string matching algorithms, KMP Matcher and Boyer Moore Algorithms. ASSIGNMENT PROBLEMS: Formulation of Assignment and Quadratic Assignment Problem.
IV	RANDOMIZED ALGORITHMS. Las Vegas algorithms, Monte Carlo algorithms, randomized algorithm for Min-Cut, randomized algorithm for 2-SAT. Problem definition of Multi commodity flow, Flow shop scheduling and Network capacity assignment problems.
V	PROBLEM CLASSES NP, NP-HARD AND NP-COMPLETE: Definitions of P, NP-Hard and NP-Complete Problems. Decision Problems. Cook's Theorem. Proving NP-Complete Problems - Satisfiability problem and Vertex Cover Problem. Approximation Algorithms for Vertex Cover and Set Cover Problem.

References:

1. **Coreman, Rivest, Lisserson**, : “Algorithm", **PHI.**
2. **Basse,** "Computer Algorithms: Introduction to Design & Analysis", **Addision Wesley.**
3. **Horowitz & Sahani**, "Fundamental of Computer Algorithm", **Galgotia.**
4. Motwani and Raghavan "Randomized Algorithms", Cambridge University Press
5. Preparata and Shamos "Computational Geometry", Springer Verlag
6. Mehlhorn "Data Structures and Algorithms: 1, Searching and Sorting", Springer Verlag EATCP

EMBEDDED SYSTEMS

Course/Paper: 06BCS-104
BCS Semester VI

Unit	Content
I	Overview of Embedded System: Embedded System, Categories and Requirements of Embedded Systems, Challenges and Issues in Embedded Software Development, Applications of Embedded Systems in Consumer Electronics, Control System, Biomedical Systems, Handheld computers, Communication devices.

II	Embedded Hardware & Software Development Environment: Hardware Architecture, Micro-Controller Architecture, Communication Interface Standards, Embedded System Development Process, Embedded Operating systems, Types of Embedded Operating systems.
III	Design quality and Microcontroller: Quality matrix, software and hardware, Estimation , 8 Bit microcontrollers Architecture, on chip peripherals, instruction set/programming of Intel MCS51 family (8 bit) Inter facing of 8051 with LCD, ADC, sensors, stepper motor, key board, DAC, memory .
IV	Real Time & Database Applications: Real- Time Embedded Software Development, Sending a Message over a Serial Link, Simulation of a Process Control System, Controlling an Appliance from the RTLinux System, Embedded Database Applications using examples like Salary Survey, Energy Meter Readings.
V	Programming Languages for Embedded Systems: Tools for building embedded systems - with case studies. Microchip PIC16 family PIC16F873 processor features architecture memory organization register file map I/O ports PORTA - PORTB PORTC Data EEPROM and flash program memory Asynchronous serial port SPI mode I2C mode.

References:

1**. R. Gupta**, "Co-synthesis of Hardware and Software for Embedded Systems", **Kluwer**

THEORY OF COMPUTATION

Course/Paper: 06BCS-105
BCS Semester VI

Unit	Content

I	Finite Automata & Regular Expression: Basic Concepts of finite state system, Deterministic and non-deterministic finite automation and designing regular expressions, relationship between regular expression & Finite automata minimization of finite automation mealy & Moore Machines.
II	Regular Sets of Regular Grammars**:** Basic Definition of Formal Language and Grammars. Regular Sets and Regular Grammars, closure proportion of regular sets, Pumping lemma for regular sets, decision Algorithms for regular sets, Myhell_Nerod Theory & Organization of Finite Automata.
III	Context Free Languages& Pushdown Automata: Context Free Grammars – Derivations and Languages – Relationship between derivation and derivation trees – ambiguity – simplification of CEG – Greiback Normal form – Chomsky normal forms – Problems related to CNF and GNF Pushdown Automata: Definitions – Moves – Instantaneous descriptions – Deterministic pushdown automata – Pushdown automata and CFL - pumping lemma for CFL - Applications of pumping Lemma.
IV	Turing Machines: Turing machines – Computable Languages and functions – Turing Machine constructions – Storage in finite control – multiple tracks – checking of symbols – subroutines – two way infinite tape. Undecidability: Properties of recursive and Recursively enumerable languages – Universal Turing Machines as an undecidable problem – Universal Languages – Rice's Theorems.
V	Linear bounded Automata Context Sensitive Language: Chomsky Hierarchy of Languages and automata, Basic Definition& descriptions of Theory & Organization of Linear bounded Automata Properties of context-sensitive languages.

References:

1. **Hopcroft, Ullman**, "Introduction to Automata Theory, Language and Computation",Nerosa Publishing House
2. **K.L.P. Mishra and N.Chandrasekaran**, "Theory of Computer Science (Automata, Languages and Computation)", **PHI**
3. **Martin J. C**., "Introduction to Languages and Theory of Computations", **TMH**

ELECTIVE:--

DIGITAL SIGNAL PROCESSING

Course/Paper: 06BCS-106.1
BCS Semester VI

Unit	Content

I	Flow Graph and Matrix Representation of Digital Filters: Signal flow graph representation of digital network, matrix representation, basic network structures for IIR and FIR systems, Telligen's theorem for digital filters and its applications.
II	Digital filter Design Techniques: Design of IIR and FIR digital filters, computer aided design of IIR and FIR filters, comparison of IIR and FIR digital filters.
III	Computation of the Discrete Fourier Transform: Goertzel algorithm, FT algorithms, decimation in time and frequency, FFFT algorithm for N a composite number, Chirp Z transforms (CZT).
IV	Discrete Random Signals: Discrete time random process ,averages spectrum representations of infinite energy signals, response of linear system to random signals
V	Power Spectrum Estimation: Basic principles of spectrum estimation, estimates of the auto covariance, power spectrum, cross covariance and cross spectrum.

ADVANCED SOFTWARE ENGINEERING

Course/Paper: 06BCS-106.2
BCS Semester VI

Unit	Content
I	SOFTWARE CONFIGURATION MANAGEMENT: SCM Process, Objects in Software configuration, Version control, Change control, Configuration audit, Status reporting, SCM standards .SOFTWARE QUALITY ASSURANCE: Quality Concepts, Quality Movement, SQA Activities and Formal Approaches to SQA.
II	SOFTWARE TESTING AND DEBUGGING: Software Testing Fundamentals .Text Case Design ,White –Box Testing, Basis Path testing, Control Structure Testing, Black Box Testing and Testing for Specialized Environments, Architectures and Applications. Program Error, Debugging Process (Information Gathering, Fault Isolation, Fault Confirmation, Documentation, Fixing fault, Testing) Debugging Example.
III	MANAGING TEAM: Understanding behavior and selecting right person for the job, Motivation, working in groups, decision making, leadership and organizational structures. INTERNATIONAL STANDARDS: Importance and defining software quality, ISO 9126, BS 6079 planning steps, ISO 12207 approach to software lifecycle data.
IV	WEB ENGINEERING**:** Attributes of Web-Based Applications. Process, Modeling activity, Analysis modeling for WebApps, Design- functional, information & interaction, testing WebApps- content, navigation, configuration, and performance testing.

V	PROJECT MANAGEMENT FOR SPECIAL CLASSES OF SOFTWARE PROJECTS: Using CASE tools, CBSE, Re-engineering, forward engineering, client/server software engineering, outsourcing, Software project management standards. Change and Content Management of Web Engineering.

References:

1**. R. S. Pressman**, Software Engineering: A Practitioners Approach, **TMH**
2. **Carlo Ghezzi, M. Jarayeri, D. Manodrioli**, Fundamentals of Software Engineering, **PHI**
3. **Pankaj Jalote**, Software Engineering, **Narosa Publication**
4**. Slini puri** "Advance Software Engineering", **Genius Publication.**
5.**Archna Jain/Nikita Jain/Prinka Panjabi** "Advance Software Engineering", **Ashirwad Publication.**

MICROWAVE AND SATELLITE COMMUNICATION

Course/Paper: 06BCS-106.3
BCS Semester VI

Unit	Content
I	Microwave Transmission System: General representation of E M field in terms of TEM, TE and TM components, Uniform guide structures, rectangular wave guides, Circular Wave guides, Solution in terms of various modes, Properties of propagating and evanescent modes, Dominant modes, Normalized model voltages and currents, Power flow and energy storage in modes frequency range of operation for single mode working, effect of higher order modes, Strip line and micro strip lines-general properties, Comparison of coaxial, Micro strip and rectangular wave guides in terms of band width, power handling capacity, economical consideration etc.
II	Origin and brief history of satellite communication; Elements of a satellite communication link; Current status of satellite communication. Orbital Mechanism and Launching of Satellite***:*** Equation of orbit, Describing the orbit, Location the satellite in the orbit, Locating the satellite with respect to earth, Orbital elements, Look angle determination, Elevation and Azimuth calculation, Geostationary and other orbits, Orbital perturbations, Orbit determination, Mechanics of launching a synchronous satellite, Selecting a launch vehicle.
III	Space Craft: Satellite subsystems, Altitude and Orbit Control (AOCS), Telemetry, Tracking and Command (TT&C). Communication subsystems, Transponders, Spacecraft antennas, Frequency re-use antennas.
IV	Satellite Channel and Link Design: Basic transmission theory, Noise temperature, Calculation of system noise temperature, Noise figure, G/T ratio of earth stations, Design of down links and uplinks using C/N ratio, FM factor for multi-channel signals, Link Design for FDM/FM, TV signals and Digital Signals.
V	Earth Station Technology: Earth station design, Basic antenna theory, antenna noise temperature; Tracking; Design of small earth station antennas, Low noise amplifiers, High power amplifiers, FDM and TDM systems.

Laboratories:--

SHELL PROGRAMMING LAB

Course/Paper: 06BCS-201
BCS Semester VI

1. Practice commands: cp, mv, rm, ln, ls, who, echo, cat, mkdir, rmdir. Wildcards (?, *) ,
   I/O redirection (<, >, >>), pipelines (|)
2. Practice commands: xargs, alias, set-unset, setenv-unsetenv, export, source, ps, job, kill.
3. Practice commands: head, tail, cut, paste, sed, grep, sort, uniq, find , locate, chmod.
4. Writing a simple shell script to echo who is logged in.
5. Write a shell script to display only executable files in a given directory.
6. Write a shell script to sort a list of file either in alphabetic order or largest file first according to user response.
7. Write a shell script to count the lines. Words and characters in its input (Note : Don't use wc).
8. Write a shell script to print end of a glossary file in reverse order using array. (Hint: use awk tail).
9. Modify cal command to accept more than one month (e.g. $cal Oct, Nov,)(Hint : use alias too)
10. Write a shell script to check whether Ram logged in, continue checking every 60 seconds until success.

NETWORK LAB

Course/Paper: 06BCS-202
BCS Semester VI

1. The lab is to be conducted in Perl programming language, Perl works on all platforms (including windows)
2. Write few basic programs of Perl.
   a. A Hello World Program
   b. Write a program to add to 10 numbers.
   c. Write a program of reading input from the keyboard and displaying them on monitor.
   d. Write a program to take two strings as input and compare them
   3. To understand advance constructs of Perl
   e. Write a program to create a list of your course (all theory courses in current semester) using array and print them.
   f. Write a program to accept ten number, store it into a hash table (Perl have itself) and when asked by user tell him that
   number exists or not. (do not store duplicate numbers)
   g. Write a program to compute the number of lines in a file.
4. Find the IP address of a host or turn an IP address into a name.
5. Connect to an FTP server and get or put files. Automate the one-time transfer of many files to download the file everyday,

which have changed since yesterday. (use Net:FTP)

6. Write a program to send mail. The programs should monitor system resources like disk space and notify admin by mail when
disk space becomes dangerously low. (use Net:mail)

7. Fetch mail from a POP3 server (use Net:pop3)

8. Find out who owns a domain (use Net:whois , Whois is a service provided by domain name registration authorities to identify
owners of domain names)

9. Test whether a machine is alive. machine can be specified using IP address or domain name of machine.

10. You have a URL that fetch its content from a Perl script, convert it to ASCII text (by stripping html tags) and display it.

11. Writing a TCP Client, Writing a TCP Server and Communicate some data over TCP

WEB PROGRAMING LAB

Course/Paper: 06BCS-203
BCS Semester VI

1. Develop a static html page using style sheet to show your own profile.
    Add a page to show 5 photos and
    Add a page to show your academics in a table
    Add a page containing 5 links to your favorite website
    Add navigational links to all above pages (add menu).

2. Update your homepage, by creating few html file (e.g. header, footer, left-sidebar, right), in these file you will put all
html code to be shown on every page.

3. Use Cascading Style Sheets to format your all pages in a common format.

4. Basic Php programs:

Write a simple "hello word" program using php.

Write a program to accept two strings (name and age) from user. Print welcome statement e.g. " Hi Ram, yourage is 24."

Write a program to create a calculator, which can support add, subtraction and multiply and division operation.

Write a program to take input parameters for a table (no. of rows and no. of columns), and create the desired
table.

    Create a "Contact Me" page -
    Ask user to enter his name, email ID,
    Use Java-Script to verify entered email address.
    Store submitted value in a MySql database.
    Display latest 5 submitted records in contact me page.

Display above record with navigation support. e.g. (next, previous, first, last).

MICROCONTROLLER LAB

Course/Paper: 06BCS-204
BCS Semester VI

1. Write a program to add two 2-byte numbers with a 3-byte sum.

2. Write a program to add an array of 8 numbers using loop.

3. Write a program to convert temperature from Fahrenheit to Centigrade.

4. Implement a sequencer traffic light controller.

5-6. Implement real time interrupt.

7-8. Interface microcontroller with stepper motor and move motor by given steps.

9-10. Interface, test and control LED display with Microcontroller.

11-12. Implement a watchdog timer and test the same to check infinite loop.

VII SEMESTER

COMPILER CONSTRUCTION

Course/Paper: 07BCS-101
BCS Semester VII

Unit	Content
I	Compiler, Translator, Interpreter definition, Phase of compiler introduction to one pass & Multipass compilers, Bootstrapping, Review of Finite automata lexical analyzer, Input, buffering, Recognition of tokens, Idea about LEX: A lexical analyzer generator, Error handling.
II	Review of CFG Ambiguity of grammars, Introduction to parsing. Bottom up parsing Top down parsing techniques, Shift reduce parsing, Operator precedence parsing, Recursive descent parsing predictive parsers. LL grammars & passers error handling of LL parser. LR parsers, Construction of SLR, Conical LR & LALR parsing tables, parsing with ambiguous grammar. Introduction of automatic parser generator: YACC error handling in LR parsers.
III	Syntax directed definitions; Construction of syntax trees, L-attributed definitions, Top down translation. Specification of a type checker, Intermediate code forms using postfix notation and three address code, Representing TAC using triples and quadruples, Translation of assignment statement. Boolean expression and control structures.
IV	Storage organization, Storage allocation, Strategies, Activation records, Accessing local and non local names in a block structured language, Parameters passing, Symbol table organization, Data structures used in symbol tables.
V	Definition of basic block control flow graphs, DAG representation of basic block, Advantages of DAG, Sources of optimization, Loop optimization, Idea about global data flow analysis, Loop invariant computation, Peephole optimization, Issues in design of code generator, A simple code generator, Code generation from DAG.

References:

1. **Aho, Sethi & Ullman**, "Compiler Design", **Addision Wesley**.
2. **Adesh kumar pandey "**compiler concept", **KATSON.**
3. **Neetu choudhary/Deepika Sharma** "Compiler Design", Genius publication.
4. **Neelam Sharma/Yetendra Sharma** "Compiler Design", Ashirwad publication.
5. **A.A. Puntanbekar** "Compiler Design",Technical Publication Pune.

DATA MININIG AND WAREHOUSING

Course/Paper: 07BCS-102
BCS Semester VII

Unit	Content
I	Overview, Motivation(for Data Mining),Data Mining-Definition & Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data, (Binning, Clustering, Regression, Computer and Human inspection), Inconsistent Data, Data Integration and Transformation. Data Reduction:-Data Cube Aggregation, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation.
II	Concept Description:- Definition, Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisons, Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean Association rules from Transactional Databases– Apriori Algorithm, Mining Multilevel Association rules from Transaction Databases and Mining Multi- Dimensional Association rules from Relational Databases.
III	What is Classification & Prediction, Issues regarding Classification and prediction, Decision tree, Bayesian Classification, Classification by Back propagation, Multilayer feed-forward Neural Network, Back propagation Algorithm, Classification methods K-nearest neighbor classifiers, Genetic Algorithm. Cluster Analysis: Data types cluster analysis, Categories of clustering methods, Partitioning methods. Hierarchical Clustering- CURE and Chameleon. Density Based Methods- DBSCAN, OPTICS. Grid Based Methods- STING, CLIQUE. Model Based Method –Statistical Approach, Neural Network approach, Outlier Analysis
IV	Data Warehousing: Overview, Definition, Delivery Process, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting.
V	Aggregation, Historical information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse.

References:

1. **M.H. Dunham**,"Data Mining:Introductory and Advanced Topics" **Pearson**

Education

2. **Jiawei Han, Micheline Kamber**, "Data Mining Concepts & Techniques" **Elsevier**

3. **Sam Anahory, Dennis Murray**, "Data Warehousing in the Real World : A

Practical Guide for Building Decision Support Systems, 1/e " **Pearson Education**

4**. Mallach,**"Data Warehousing System", **TMH**

5. **Gajendra Sharma,** Data Mining And Warehousing, **Katson**

LOGIC SYNTHESIS

Course/Paper: 07BCS-103
BCS Semester VII

Unit	Content
I	Introduction to VLSI, circuits Asics and Moore's Law. Microelectronic Design, Styles, four phases in creating Microelectronics chips computer Aided Synthesis and Optimization. Algorithms Review of Graph Definitions and Notations Decision and Optimization Problems, Shortest and Longest Path Problems, Vertex Cover, Graph, Coloring, Clique covering and partitioning Algorithms Boolean Algebra and Representation of Boolean Functions, binary Decision diagrams. Satisfiability and cover problems.
II	Hardware Modeling: Introduction to Hardware Modeling Language, State Diagrams. Data flow and Sequencing Graphs. Compilation and Behavioral Optimization Techniques. Circuits Specifications for Architectural Synthesis Resources and constraints. Fundamental Architectural Synthesis Problems Temporal Domain Scheduling Spatial Domain Binding Hierarchical Models and Synchronization Problem. Area and performance estimation-Resource Dominated circuits and General Circuits.
III	Scheduling Algorithms: Model for Scheduling Problems, Scheduling without Resource, Constraints-Unconstrained Scheduling ASAP Scheduling Algorithms Latency. Constrained Scheduling. ALAP scheduling. Under Timing Constraints and Relative Scheduling with Resource Constraints Integer Linear Programming Model, Multiprocessor Scheduling, Heuristic Scheduling Algorithms (List Scheduling). Force Directed Scheduling.
IV	Two Level Combination Logic Optimization: Logic Optimization Principles-Definitions, Exact Logic Minimization, Heuristic, Logic Minimization, and Testability Properties Operations on Two level logic Cover-positional Cube Notation, Functions with Multivolume inputs and list oriented manipulation. Algorithms for logic minimization.
V	Sequential logic optimization: Introduction, Sequential circuit optimization using state based models- state minimization, state encoding. Sequential circuit optimization using network models. Implicit finite state machine traversal methods. Testability consideration for synchronous circuits.

ARTIFICIAL INTELLIGENCE

Course/Paper: 07BCS-104
BCS Semester VII

Unit	Content
I	Meaning and definition of artificial intelligence, Various types of production systems, Characteristics of production systems, Study and comparison of breadth first search and depth first search. Techniques, other Search Techniques like hill Climbing, Best first Search. A* algorithm, AO* algorithms etc, and various types of control strategies.
II	Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and non-monotonic reasoning.
III	Probabilistic reasoning, Baye's theorem, semantic networks scripts schemas, frames, conceptual dependency and fuzzy logic, forward and backward reasoning.
IV	Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing.
V	Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural networks, common sense, reasoning, some example of expert systems.

References:

1. **Charnick** "Introduction to A.I.", **Addision Wesley**
2. **Rich & Knight**, "Artificial Intelligence"
3. **Elamie,** "Artificial Intelligence", **Academic Press**
4. **Amit Konar**, Artificial Intelligence and Soft Computing, **CRC**
5. **Archana Jain, Mukesh Verma**, Artificial Intelligence & Expert System, **Ashirwad**

MULTIMEDIA SYSTEMS

Course/Paper: 07BCS-105
BCS Semester VII

Unit	Content
I	Introduction to Multimedia, Multimedia Information, Multimedia Objects, Multimedia in business and work. Convergence of Computer, Communication and Entertainment products and Stages of Multimedia Projects, Multimedia hardware, Memory & storage devices, Communication devices, Multimedia software's, presentation tools, tools for object generations, video, sound, image capturing, authoring tools, card and page based authoring tools.
II	Multimedia Building Blocks Text, Sound MIDI, Digital Audio, audio file formats, MIDI under windows environment Audio & Video Capture.
III	Data Compression Huffman Coding, Shannon Fano Algorithm, Huffman Algorithms, Adaptive Coding, Arithmetic Coding Higher Order Modeling. Finite Context Modeling, Dictionary based Compression, Sliding Window Compression, LZ77, LZW compression, Compression, Compression ratio loss less & lossy compression.
IV	Speech Compression & Synthesis Digital Audio concepts, Sampling Variables, Loss less compression of sound, loss compression & silence compression.

V	Images: Multiple monitors, bitmaps, Vector drawing, lossy graphic compression, image file formatic animations Images standards, JPEG Compression, Zig Zag Coding, Multimedia Database. Content based retrieval for text and images, Video: Video representation, Colors, Video Compression, MPEG standards, MHEG Standard Video Streaming on net, Video Conferencing, Multimedia Broadcast Services, Indexing and retrieval of Video Database, recent development in Multimedia

References:

1. **Tay Vaughan** "Multimedia, Making IT Work" **Osborne TMH.**
2. **Buford** "Multimedia Systems" **Addison Wesley.**
3. **Aagrawal & Tiwari** "Multimedia Systems**" Excel**.
4. **Sleinreitz** "Multimedia System" **Addison Wesley**.

ELECTIVE:--

SERVICE ORIENTED ARCHITECHURE

Course/Paper: 07BCS-106.1
BCS Semester VII

Unit	Content
I	SOA Fundamentals: Defining SOA, Business Value of SOA, Evolution of SOA, SOA characteristics, concept of a service in SOA, misperceptions about SOA, Basic SOA architecture, infrastructure services, Enterprise Service Bus (ESB), SOA Enterprise Software models, IBM On Demand operating environment.
II	Web services Technologies: XML technologies – XML, DTD, XSD, XSLT, XQuery, XPath Web services technologies - Web services and SOA, WSDL, SOAP, UDDI WS Standards (WS-*) - Web services and Service oriented enterprise (SOE), WS-Coordination and WS-Transaction, Business Process Execution Language for Web Services (BPEL4WS), WS-Security and the Web services security specifications, WS-Reliable Messaging, WS Policy, WS-Attachments.
III	SOA Planning and Analysis: Stages of the SOA lifecycle, SOA Delivery Strategies, service-oriented analysis, Capture and assess business and IT issues and drivers, determining non-functional requirements (e.g., technical constraints, business constraints, runtime qualities, non-runtime qualities), business centric SOA and its benefits, Service modeling, Basic modeling building blocks, service models for legacy application integration and enterprise integration, Enterprise solution assets(ESA) .
IV	SOA Design and implementation: service-oriented design process, design activities, determine services and tasks based on business process model, choosing appropriate standards, articulate architecture, mapping business processes to technology, designing service integration environment (e.g., ESB, registry), Tools available for appropriate designing, implementing SOA, security implementation, implementation of integration patterns, services enablement, quality assurance.
V	Managing SOA Environment: Distributing service management and monitoring concepts, operational management challenges, Service-level agreement considerations, SOA governance (SLA, roles and responsibilities, policies, critical success factors, and metrics), QoS compliance in SOA governance, role of ESB in SOA governance, impact of changes to services in the SOA lifecycle.

Reference:

1.SOA Design Patterns (The Prentice Hall Service-Oriented Computing Series from Thomas Erl) by Thomas Erl
2.SOA Principles of Service Design by Thomas Erl
3.Service-Oriented Architecture (SOA): Concepts, Technology, and Design by Thomas Erl
4.SOA in Practice: The Art of Distributed System Design (Theory in Practice) by Nicolai M. Josuttis

5.Service Oriented Architecture (SOA) For Dummies, 2nd Edition (For Dummies (Computer/Tech)) by Judith Hurwitz, Robin Bloor, Marcia Kaufman, and Fern Halper

OPTICAL COMMUNICATION

Course/Paper: 07BCS-106.2
BCS Semester VII

Unit	Content
I	Introduction to optical communication principles of light transmission optical fiber modes and configurations, Mode theory for circular wave-guides, Single-mode fibers, Multimode fibers, Numerical aperture, Mode field diameter, Vnumber, fiber materials, Fiber fabrication techniques.
II	Optical sources, LED'S, LASER diodes, Model reflection noise, Power launching and coupling, population inversion, fiber splicing, optical connectors, Photo-detectors, PIN, Avalanche detector, Response time, Avalanche multiplication noise.
III	Signal degradation in optical fibers, Attenuation losses, Signal distortion in optical wave guides, Material dispersion, Wave guide dispersion, Chromatic dispersion, Inter-modal distortion, Pulse broadening in Graded index fibers, Mode coupling, Advance fiber designs: dispersion shifted, Dispersion flattened, Dispersion compensating fibers, Design optimization of single mode fibers.
IV	Coherent optical fiber communication, Modulation techniques for Homodyne and Heterodyne systems, Optical filter link design. Rise time budget and link power budget, Long haul systems bit error rate, line coding, NRZ, RZ, Block Codes eye pattern.
V	Advance system and techniques, wavelength division multiplexing, optical amplifiers semiconductor amplifier, EDFA, Comparison between semiconductor and optical amplifier, Gain band width, Photonic switching, Optical Networks. Optical fiber bus, Ring topology, Star architectures, FDDI, SON-ET.

Reference:

1.Optical Communication Networks by Biswanath Mukherjee

2.Optical Fiber Communications: Principles and Practice (3rd Edition) by John Senior

3.Introduction to Optical Communication, Lightwave Technology, Fiber Transmission, and Optical Networks by Lawrence Harte and David Eckard

4.OFDM for Optical Communications by William Shieh and Ivan Djordjevic

5.Optical Communications (Wiley Series in Telecommunications and Signal Processing) by Robert M. Gagliardi and Sherman Karp

REAL TIME SYSTEMS

Course/Paper: 07BCS-106.3
BCS Semester VII

Unit	Content
I	Introduction: Definition, Typical Real Time Applications: Digital Control, High Level Controls, Signal Processing etc., Release Times, Deadlines, and Timing Constraints, Hard Real Time Systems and Soft Real Time Systems, Reference Models for Real Time Systems: Processors and Resources, Temporal Parameters of Real Time Workload, Periodic Task Model, Precedence Constraints and Data Dependency.
II	Real Time Scheduling: Common Approaches to Real Time Scheduling: Clock Driven Approach, Weighted Round Robin Approach, Priority Driven Approach, Dynamic Versus Static Systems, Optimality of Effective-Deadline-First (EDF) and Least-Slack-Time-First (LST) Algorithms, Offline Versus Online Scheduling, Scheduling Aperiodic and Sporadic jobs in Priority Driven and Clock Driven Systems.
III	Resources Access Control: Effect of Resource Contention and Resource Access Control (RAC), Non-preemptive Critical Sections, Basic Priority-Inheritance and Priority-Ceiling Protocols, Stack Based Priority-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption Ceiling Protocol, Access Control in Multiple-Unit Resources, Controlling Concurrent Accesses to Data Objects.
IV	Multiprocessor System Environment: Multiprocessor and Distributed System Model, Multiprocessor Priority-Ceiling Protocol, Schedulability of Fixed-Priority End-to-End Periodic Tasks, Scheduling Algorithms for End-to-End Periodic Tasks, End-to-End Tasks in Heterogeneous Systems, Predictability and Validation of Dynamic Multiprocessor Systems, Scheduling of Tasks with Temporal Distance Constraints.
V	Real Time Communication: Model of Real Time Communication, Priority-Based Service and Weighted Round- Robin Service Disciplines for Switched Networks, Medium Access Control Protocols for Broadcast Networks, Internet and Resource Reservation Protocols, Real Time Protocols, Communication in Multicomputer System, An Overview of Real Time Operating Systems.

References:

1. Real Time Systems by **Jane W. S. Liu, Pearson Education Publication**.
2. Real-Time Systems: Scheduling, Analysis, and Verification by **Prof. Albert M. K.Cheng, John Wiley and Sons Publications.**
3. Real Time System, **Poonam Singh, Dhanpat Rai**

PRINCIPLES AND PRACTICE OF MANAGEMENT

Course/Paper: 07BMD101
MBA Semester-VII

Objective:

This course provides the student with an understanding of how the philosophy of management underlies the MBA course taught on the program. The objective of this paper is to familiarize the student with basic management concepts and behavioral processes in the organization. The course will be an introduction to the way in which a firm can develop its

managerial thinking, mission and strategy. It will enable students to evaluate and analyze a firm's management.
Philosophy, to understand the impact this philosophy has on the organization and operation of the business.

Section A
Management an Overview, Management Defined, Functions of Management, Managerial Roles and responsibilities, System and Contingency Approach for understanding organizations, Management Thought-Classical Perspective, Scientific Management, Administrative Management, Bureaucratic Management, Behavioral Perspective. Managerial processes, functions, skills and rules in an organization, social responsibilities of Business.
Fundamentals of Planning - Objectives, Strategies, Policies, Decision-making.
Fundamentals of Organizing- Nature and purpose, departmentation, Span of Management, Strategic organizing design, line and staff authority and decentralization.
Direction-concept, Leadership- Meaning and Importance, transitions in leadership theories, trait theories, behavioral theories, contingency theories, leadership styles and skills, managerial culture and leadership. Coordination.
Control- concept, nature and purpose, control technique, control of overall performance, span of control.

Section-B

Case Study

References:

1. Management, Stonner, James & Others, Pearson Education N.D.
2. Management, Robbins & Coulter, Pearson Education N.D.
3. Principles of management, R.L. Nolakha , R.B.D. Jaipur
4. Principle of Management, Parthasarathy, Vrinda N.D.
5. Principle & practise of management, P.Subharao, Hari Shanker Pandey, Ramesh Book Depot
6. Management, G.S.Sudha, R.B.D. Jaipur

MANAGERIAL ECONOMICS

Course/Paper: 07BMD102
MBA Semester-VII

Objective:
With economies becoming increasingly market oriented, it is becoming important for players in the market place to learn to conduct them in a manner that will assure them of success. The objective of the course is to provide insights into these aspects. Students of management must be exposed to the time tested tools and techniques of managerial economics to enable them to appreciate their relevance in decision-making.

Section-A
Nature and Scope of Managerial Economics, role and Responsibility of a Managerial Economist. The fundamental concepts of Managerial Economics, theory of the firm and the role of profits
Theory of Demand- concept, determinants of Demand, Demand Function and econometric techniques. Theory of Supply- concept, determination, analysis, supply function. Elasticity of Demand- concept, measurement. Concept of Consumer's surplus.
Analysis and costs estimation-economic Concept of Cost, Different Types of Cost: Managerial uses of cost Function; Production Function to cost function-long run and short run total cost, Break-even Analysis. Make or Buy Decisions.

Market structure and pricing decisions-the competitive and monopoly model, monopolistic competition and oligopoly, pricing of multiple products.
National income-concept and measurement. Business cycles, fiscal policy, Inflation. The new economy-definition and characteristics.

Section-B

Case study.

References:

1. Business Economics, Adhikary, manab, Excel books, N.D.
2. Economic Theory & Operation Analysis, Baumol, William J, N.D. PHI.
3. Business Economics, Agarwal & Deo, N.D. PHI.
4. Managerial Economics, D.N. Dwivedi, N.D. PHI.
5. Managerial Economics, Jhingen & Stephen, N.D. PHI.
6. Managerial Economics, Mote Others, N.D. PHI
7. Managerial Economics, Saraswat lodha, Ajmera Book depot.
8. Managerial Economics, Nair, Banerjee & Agarwal, Pragati Prakashan, Meerut.

INTERNATIONAL BUSINESS MANAGEMENT

Course/Paper: 07BMD103
MBA Semester-VII

Objectives:
To develop an integrated understanding of International management aspects for devising and implementing Global management Strategies.

Section A
International business concept, nature, importance, dimensions, domestic and international business, process of internationalization-decision framework for internationalization. International trade theories, foreign direct investment theories, international business environment social, political, cultural and legal Globalization, rationalization: regional economic integration in Europe, NAFTA, role of regional and international institution: WTO, IMP, UNCTAD, SAARC in international trade, intellectual property in global business, role of WIPO.
Foreign exchange market, international monitory system
Method of entry in foreign markets, licensing, franchising, joint venture, subsidiaries, acquisition, strategic alliances, contract manufacturing.
International business: product decisions, market selection, distribution, promotion international pricing-factors, process and method, prerequisites. Transfer pricing, dumping, Control in international business: need objectives and approaches.

Section-B

Case Study

References:

1. International Business, K.Aswathappa, Tata McGraw Hill.
2. International Business, Charles W L hill, Arun K Jain, TataMcGraw Hill.
3. International Management, Managing in a Diverse & Diverse & Dynamic Global Environment, Arvind V Phatak, Rabi S. Bhagat. Tata Mc Graw Hill.
4. International Business, Donald Ball, Michael Geringer, Michael Minor, Tata Mc Graw Hill.
5. International Business management, Pragati Agarwal, Pragati prakashan, , Meerut.

Laboratories:--

COMPILER DESIGN LAB

Course/Paper: 07BCS-201
BCS Semester VII

1. Develop a lexical analyzer to recognize a few patterns in PASCAL and C.
    a. (ex: identifiers, constants, comments, operators etc.)
2. Write a program to parse using Brute force technique of Top down parsing.
3. Develop on LL (1) parser (Construct parse table also).
4. Develop an operator precedence parser (Construct parse table also)
5. Develop a recursive descent parser.
6. Write a program for generating for various intermediate code forms
    a. i) Three address code ii) Polish notation
7. Write a program to simulate Heap storage allocation strategy
8. Generate Lexical analyzer using LEX
9. Generate YACC specification for a few syntactic categories.
10. Given any intermediate code form implement code optimization techniques

DATA MINING AND WAREHOUSING LAB

Course/Paper: 07BCS-202
BCS Semester VII

The objective of the lab exercises is to use data mining techniques to use standard databases available to understand DM processes using any DM tool)

2. Gain insight for running pre- defined decision trees and explore results using MS OLAP Analytics.

6. Using IBM OLAP Miner – Understand the use of data mining for evaluating the content of multidimensional
cubes.

7. Using Teradata Warehouse Miner – Create mining models that are executed in SQL.

(Portal work : The objective of this lab exercises is to integrate pre-built reports into a portal application)

8. Publish and analyze a business intelligence portal.

Metadata & ETL Lab: The objective of this lab exercises is to implement metadata import agents to pull metadata from leading
business intelligence tools and populate a metadata repository. To understand ETL processes

9. Import metadata from specific business intelligence tools and populate a meta data repository.

8. Publish metadata stored in the repository.

9. Load data from heterogeneous sources including text files into a pre-defined warehouse schema.

Case study

3. Design a data mart from scratch to store the credit history of customers of a bank. Use this credit profiling to process
future loan applications.

4. Design and build a Data Warehouse using bottom up approach titled 'Citizen Information System'.

LOGIC SYNTHESIS LAB

Course/Paper: 07BCS-203
BCS Semester VII

1. Write a program which reads simple digital circuit (of size up to 10 gates) in blif / Boolean equation and display
schematic in graphics format.
2. Write a program to convert Blif format into Boolean equation.
3. Write a program that estimate area of circuit (specified as Blif or Boolean equation) using library binding technique of
simple circuit (up to 10 gates).
4. Write a program to implement state machine up to 5 states.
5. Write a program to count 4-input lookup table in a simple circuit (up to 10 gates specified as Blif or Boolean equation).
6. Write a program to obtain sequencing graph for a given set of arithmetic expression (up to 10 nodes)
7. Write VHDL Codes for all gates with all Modeling.
8. Write VHDL Codes & Test bench for half adder and full adder

PROJECT STAGE-I

Course/Paper: 07BCS-204
BCS Semester VII

Here students have to submit synopsis and then a detailed analysis of their project with literature survey.

PRACTICAL TRAINING SEMINAR

Course/Paper: 07BCS-205
BCS Semester VII

Here students have to submit training reports as well as they are required to give a brief presentation of there training in external and internal.

VIII SEMESTER

INFORMATION SYSTEM AND SECURITIES

Course/Paper: 08BCS-101
BCS Semester VIII

Unit	Content

I	Introduction to security attacks, services and mechanism, introduction to cryptography. Conventional Encryption: Conventional encryption model, classical encryption techniques- substitution ciphers and transposition ciphers, cryptanalysis, stereography, stream and block ciphers. Modern Block Ciphers: Block ciphers principals, Shannon's theory of confusion and diffusion, fiestal structure, data encryption standard(DES), strength of DES, differential and linear crypt analysis of DES, block cipher modes of operations, triple DES, IDEA encryption and decryption, strength of IDEA, confidentiality using conventional encryption, traffic confidentiality, key distribution, random number generation.
II	Introduction to graph, ring and field, prime and relative prime numbers, modular arithmetic, Fermat's and Euler's theorem, primality testing, Euclid's Algorithm, Chinese Remainder theorem, discrete logarithms. Principals of public key crypto systems, RSA algorithm, security of RSA, key management, Diffle-Hellman key exchange algorithm, introductory idea of Elliptic curve cryptography, Elganel encryption.
III	Message Authentication and Hash Function: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions and MACS, MD5 message digest algorithm, Secure hash algorithm(SHA). Digital Signatures: Digital Signatures, authentication protocols, digital signature standards (DSS), proof of digital signature algorithm.
IV	Authentication Applications: Kerberos and X.509, directory authentication service, electronic mail security-pretty good privacy (PGP), S/MIME.
V	IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management. Web Security: Secure socket layer and transport layer security, secure electronic transaction (SET). System Security: Intruders, Viruses and related threads, firewall design principals, trusted systems.

References:

1. **William Stallings**, "Cryptography and Network Security: Principals and Practice", **Prentice Hall, New Jersy.**
2**. Johannes A. Buchmann,** "Introduction to Cryptography", **Springer-Verlag**.
3. **Bruce Schiener**, "Applied Cryptography".

CAD FOR VLSI DESIGN

Course/Paper: 08BCS-102
BCS Semester VIII

Unit	Content
I	Modern digital systems, complexity and diversity of digital systems, productivity gap and need for CAD tools. Introduction to steps and CAD flow for designing with ASIC and FPGA.
II	Introduction to VHDL, background, VHDL requirement, Elements of VHDL, top down design, convention and syntax, basic concepts in VHDL i.e. characterizing H/W languages, objects, classes, and signal assignments.
III	Structural specification of H/W- Parts library, Wiring, modeling, binding alternatives, top down wiring. Design organization and parameterization. Type declaration, VHDL operators.
IV	VHDL subprogram parameters, overloading, predefined attributes, user defined attributes, packaging basic utilities. VHDL as a modeling language- bi-directional component modeling, multi mode component modeling,

V	Examples of VHDL synthesis subsets- combinational logic synthesis, sequential circuit synthesis, state machine synthesis. VHDL language grammar. Introduction to synthetic circuits and circuit repositories.

ADVANCED COMPUTER ARCHITECTURES

Course/Paper: 08BCS-103
BCS Semester VIII

Unit	Content
I	INTRODUCTION**:** Parallel Computing, Parallel Computer Model, Program and Network Properties, Parallel Architectural Classification Schemes, Flynn's & Feng's Classification, Performance Metrics and Measures, Speedup Performance Laws: Multiprocessor System and Interconnection Networks; IEEE POSIX Threads: Creating and Exiting Threads, Simultaneous Execution of Threads, Thread Synchronization using Semaphore and Mutex, Canceling the Threads.
II	PIPELINING AND MEMORY HIERARCHY: Basic and Intermediate Concepts, Instruction Set Principle; ILP: Basics, Exploiting ILP, Limits on ILP; Linear and Nonlinear Pipeline Processors; Super Scalar and Super Pipeline Design; Memory Hierarchy Design: Advanced Optimization of Cache Performance, Memory Technology and Optimization, Cache Coherence and Synchronization Mechanisms.
III	THREAD AND PROCESS LEVEL PARALLEL ARCHITECTURE: Introduction to MIMD Architecture, Multithreaded Architectures, Distributed Memory MIMD Architectures, Shared Memory MIMD Architecture, Clustering, Instruction Level Data Parallel Architecture, SIMD Architecture, Fine Grained and Coarse Grained SIMD Architecture, Associative and Neural Architecture, Data Parallel Pipelined and Systolic Architectures, Vector Architectures.
IV	Parallel Algorithms: PRAM Algorithms: Parallel Reduction, Prefix Sums, Preorder Tree Traversal, Merging two Sorted lists; Matrix Multiplication: Row Column Oriented Algorithms, Block Oriented Algorithms; Parallel Quicksort, Hyper Quick sort; Solving Linear Systems: Gaussian Elimination, Jacobi Algorithm; Parallel Algorithm Design Strategies.
V	Developing Parallel Computing Applications: OpenMP Implementation in 'C': Execution Model, Memory Model; Directives: Conditional Compilation, Internal Control Variables, Parallel Construct, Work Sharing Constructs, Combined Parallel Work-Sharing Constructs, Master and Synchronization Constructs; Run-Time Library Routines: Execution Environment Routines, Lock Routines, Timing Routines; Simple Examples in 'C'. Basics of MPI.

References:

1. **Kai Hwang**," Advance Computer Architecture", **TMH**
2. **Hennessy and Patterson**," Computer Architecture: A Quantitative Approach", **Elsevier**
3. **Dezso and Sima,** "Advanced Computer Architecture", **Pearson**
4. M.J. Flynn, " Computer Architecture: Pipelined and Parallel Processor Design", Narosa Publishing House/Jones

ELECTIVE:--

DISTRIBUTED SYSTEMS

Course/Paper: 08BCS-104.1
BCS Semester VIII

Unit	Content
I	CHARACTERIZATION OF DISTRIBUTED SYSTEMS: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. System Models: Architectural models, Fundamental Models Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks, Causal ordering of messages, global state, termination. Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.

II	DISTRIBUTED DEADLOCK DETECTION: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms. Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database system.
III	DISTRIBUTED OBJECTS AND REMOTE INVOCATION: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study. SECURITY: Overview of security techniques, Cryptographic algorithms, Digital signatures Cryptography pragmatics, Case studies: Needham Schroeder, Kerberos, SSL & Millicent. DISTRIBUTED FILE SYSTEMS: File service architecture, Sun Network File System, The Andrew File System, Recent advances.
IV	TRANSACTIONS AND CONCURRENCY CONTROL: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control. DISTRIBUTED TRANSACTIONS: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault - tolerant services, highly available services, Transactions with replicated data.
V	DISTRIBUTED ALGORITHMS: Introduction to communication protocols, Balanced sliding window protocol, Routing algorithms, Destination based routing, APP problem, Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm. CORBA CASE STUDY: CORBA RMI, CORBA services.

References:

1. **Coulouris, Dollimore, Kindberg,** "Distributed System: Concepts and Design", **Pearson Ed.**
2. **Gerald Tel**, "Distributed Algorithms", **Cambridge University Press**
3.**William Stalling**, Distributed System, **Addision Wesley**

IMAGE PROCESSING

Course/Paper: 08BCS-104.2
BCS Semester VIII

Unit	Content
I	Introduction and Fundamentals: Motivation and Perspective, Applications, Components of Image Processing System, Element of Visual Perception, A Simple Image Model, Sampling and Quantization. Image Enhancement Spatial Domain: Introduction; Basic Gray Level Functions – Piecewise-Linear Transformation Functions: Contrast Stretching; Histogram Specification; Histogram Equalization; Local Enhancement; Enhancement using Arithmetic/Logic Operations – Image Subtraction, Image Averaging; Basics of Spatial Filtering; Smoothing – Mean filter, Ordered Statistic Filter; Sharpening – The Laplacian.
II	Image Enhancement in Frequency Domain: Fourier Transform and the Frequency Domain, Basis of Filtering in Frequency Domain, Filters – Low-pass, High-pass; Correspondence Between Filtering in Spatial and Frequency Domain; Smoothing Frequency Domain Filters – Gaussian Low pass Filters; Sharpening Frequency Domain Filters – Gaussian High pass Filters; Homomorphic Filtering. Image Restoration: A Model of Restoration Process, Noise Models, Restoration in the presence of Noise only Spatial Filtering – Mean Filters: Arithmetic Mean filter, Geometric Mean Filter, Order Statistic Filters – Median Filter, Max and Min filters; Periodic Noise Reduction by Frequency Domain Filtering – Band pass Filters; Minimum Meansquare Error Restoration.
III	Color Image Processing: Color Fundamentals, Color Models, Converting Colors to different models, Color Transformation, Smoothing and Sharpening, Color Segmentation. Morphological Image Processing: Introduction, Logic Operations involving Binary Images,

	Dilation and Erosion, Opening and Closing, Morphological Algorithms – Boundary Extraction, Region Filling, Extraction of Connected Components, Convex Hull, Thinning, Thickening.
IV	Registration: Introduction, Geometric Transformation – Plane to Plane transformation, Mapping, Stereo Imaging – Algorithms to Establish Correspondence, Algorithms to Recover Depth. Segmentation: Introduction, Region Extraction, Pixel-Based Approach, Multi-level Thresholding, Local Thresholding, Region-based Approach, Edge and Line Detection: Edge Detection, Edge Operators, Pattern Fitting Approach, Edge Linking and Edge Following, Edge Elements Extraction by Thresholding, Edge Detector Performance, Line Detection, Corner Detection.
V	Feature Extraction: Representation, Topological Attributes, Geometric Attributes. Description: Boundary-based Description, Region-based Description, Relationship. Object Recognition: Deterministic Methods, Clustering, Statistical Classification, Syntactic Recognition, Tree Search, Graph Matching.

Reference:

1.Digital Image Processing (3rd Edition) by Rafael C. Gonzalez and Richard E. Woods
2.Practical Algorithms for Image Analysis with CD-ROM by Lawrence O'Gorman, Michael J. Sammon, and Michael Seul
3.The Image Processing Handbook by John C. Russ
4.Feature Extraction & Image Processing, Second Edition by Mark Nixon and Alberto S Aguado
5.Digital Image Processing: An Algorithmic Introduction using Java by Wilhelm Burger and Mark James Burge

NATURAL LANGUAGE PROCESSING

Course/Paper: 08BCS-104.3
BCS Semester VIII

Unit	Content
I	Introduction to Natural Language Understanding: The study of Language, Applications of NLP, Evaluating Language Understanding Systems, Different levels of Language Analysis, Representations and Understanding, Organization of Natural language Understanding Systems, Linguistic Background: An outline of English syntax.
II	Introduction to semantics and knowledge representation, Some applications like machine translation, database interface.
III	Grammars and Parsing: Grammars and sentence Structure, Top-Down and Bottom-Up Parsers, Transition Network Grammars, Top-Down Chart Parsing. Feature Systems and Augmented Grammars: Basic Feature system for English, Morphological Analysis and the Lexicon, Parsing with Features, Augmented Transition Networks.
IV	Grammars for Natural Language: Auxiliary Verbs and Verb Phrases, Movement Phenomenon in Language, Handling questions in Context-Free Grammars. Human preferences in Parsing, Encoding uncertainty, Deterministic Parser.
V	Ambiguity Resolution: Statistical Methods, Probabilistic Language Processing, Estimating Probabilities, Part-of- Speech tagging, Obtaining Lexical Probabilities, Probabilistic Context-Free Grammars, Best First Parsing. Semantics and Logical Form, Word senses and Ambiguity, Encoding Ambiguity in Logical Form

Reference:

1.Foundations of Statistical Natural Language Processing by Christopher D. Manning and Hinrich Schuetze
2.Natural Language Processing with Python by Steve Bird, Ewan Klein, Edward Loper, and Bird Steven
3.Natural Language Processing and Text Mining by Anne Kao and Steve R. Poteet
4.Speech and Language Processing (2nd Edition) by Daniel Jurafsky and James H. Martin
5.Natural Language Processing for Online Applications: Text Retrieval, Extraction and Categorization by Peter Jackson and Isabelle Moulinier

HUMAN RESOURCE MANAGEMENT

Course/Paper: 08BMD101
MBA Semester-VIII

Objective:
To become a successful manager of people, students need to understand behavior of human resources in various organizational situations. In a complex world of industry and business, organizational efficiency is largely dependent on the contribution made by the human resources of the organization. The objective of this course is to sensitize students to various facts of managing people and to create an understanding of the various policies and practices of human resource management.

Section-A
Human Resource Management-. Introduction and Scope, HRD-Concept, Need, Human Resource
Planning-Concept, Process, job design-Concept approaches, job analysis, job description, job specification. Human Resource Procurement-Recruitment. Selection and induction.
Training, Training phases, Need Assessment, Establishment, Establishment of Training Objectives, Training method Lecture, case method, Role-playing. Business in Basket T-Group, Incident, Syndicate, Evaluation of a training Program. Performance measurement and reward systems-introduction, performance drivers, leadership and performance, reward management performance appraisals. Discipline. The grievance procedure.
Employee compensation-purpose and importance, components. non monetary rewards, workers participation in Management Employee. Strategic challenges for leadership, career management, SHRM Mergers and acquisitions.

Section-B
Case/Problems.

References:

1. Human Resource & Personal Management, Aswathappa K, TMH N.D.
2. Human Resource Mangement, L.M.Prasad, S.Chand
3. Human Resource Management, V.S.P.Rao, Excel books, N.D
4. International Human Resource management, Chris Brewster, University Press
5. Human Resource Management, Mizra S Saiyadain, Tata McGraw Hill.
6. Human Resource management, H.John Bernardin, Tata McGraw Hill

MARKETING MANAGEMENT

Course/Paper: 08BMD102
MBA Semester-VIII

Objective:
Marketing is no longer a company department charged with a limited number of tasks- it is a company wide undertaking. It drives the company's vision, mission and strategic planning.

Marketing succeeds only when all departments work together to achieve goals. The student will be able to understand these concepts.

Section-A

Understanding Marketing Management-Importance and scope. Marketing strategies and plans marketing and customer value. Marketing insights-information and scanning the environment, analyzing the macro environment. Rural Marketing: The profile of rural market of India. The main problem area in rural marketing, channel Management in rural markets, marketing communication in Rural Markets, Market Segmentation in rural market.

Consumer Behavior and market segmentation- Targeting and positioning as per the changing pattern of Indian consumers-levels of market segmentation, segmenting consumer markets, market targeting. Product Life Cycle Strategy, New Product Development Strategy.

Management of Marketing Efforts: building brands dealing with competition, competitive brand strategy. Product Policy and Pricing decision, Channels of distribution.

Managing the Marketing program-advertisement, sales promotion, direct marketing and Personal selling, interactive marketing (E-Marketing) Marketing Research and Information System.

Section-B
Case Study
References:

1. Marketing Management, Kotler Philip Keller.
2. Marketing Management Planning & Implementation, Ramaswamy & Namakumari,
3. Principle of Marketing, Kotler & Aemstrong, Pearson Education N.D.
4. Marketing Management, Datta & Datta, Pearson Education N.D.
5. Marketing management, Kumar meenakshi, vikas publishing house.
6. Marketing management, kothari Sharma Mehta, RBD
7. Marketing management, P.K. Agarwal, Pragati prakashan, Meerut.

FINANCIAL MANAGEMENT

Course/Paper : 08BMD103
MBA Semester-VIII

Objective:

The focus in this paper would be on issues related to financial management in the Indian Corporate Sector. The contents are related to the practices observed in Indian Corporate Sector. The objective is to enable and equip the manager with basic tools for applying financial analysis.

Section-A

Meaning, Importance and Objectives of Financial Management; Time value of money; Conflicts in profit versus value maximization principle; Functions of chief financial officer.

Risk and Return- overview of capital market theory, Beta Estimation, CAPM, and APT.

Management of working capital; Cash and Marketable securities management; Treasury Management, Receivables management, Inventory management, Financing of working capital.

Investment decisions: Capital budgeting- concept, theory. Cost of capital. Risk analysis in capital budgeting.

Financing decisions: Concepts of operating and financial leverage; Capital structure Theory and Policy; Dividend Policy. Different sources of finance: Asset Based financing- Lease, Hire Purchase and Project Financing. Corporate Restructuring, Merger and Acquisition.

Section-B

Case/Problems

Note: 50% of the question will be numerical.

References:

1. Principle of Corporate Finance, Brealy & Hyres, TMH N.D
2. Financial Management & policy, Horne James C. Van, TMH N.D
3. Financial Management, Khan Jain, TMH N.D
4. Financial Management, M.R.Agarwal, Garima Publication.
5. Financial Management, Prasan Chandra, Tata Mc graw hill.
6. Financial Management(Strategy Implementation & Control), Kapil Sheeba, Kapil K.N., Pragati Prakashan, Meerut.

MANAGEMENT INFORMATION SYSTEM

Course/Paper: 08BMD104
MBA Semester-VIII

Objective:
The course is an introduction of computer architecture, networks and software tools. This will help students to understand the role of information systems and technology with current business and management application.

Section-A
Information & System Concepts-Introduction --Concepts, Classification of Information, Methods of Data & Information Collection, Value of Information, Organization and Information, System: A Definition. Types of Systems, System Decomposition, Integration of Sub Systems, Elements of a System, Human as an Information Processing System. International Business and IT.
Management Information System-MIS: Definition, Nature & Scope, MIS Characteristics, Functions, Structure of MIS, Role of MIS, MIS as a Control System, Process of Management, Application of MIS, ERP & IT's Benefits.
Internet-Introduction to Internet, Why We Need Internet, Internet Tools & Services, www, Internet in India, Security, Web Browser, Future of Internet, E-Comm. an Introduction, E-Business Fundamentals.
New Information Technology: Interconnection and networking, Multimedia, Neural Networks, Artificial Intelligence, Executive Information System, Decision Support System (DSS) and Expert Systems.
Issues for Senior Management: Management Control, Management Issues, Security Issues: Viruses, Worms and other creatures, I T issues for Management, Management in a Technological Environment, the changing world of Information.

Section-B
Case Study.

References:

1. Computer Fundamental Concepts & system, P. K. Sinha, BPB PUB. N.D.
2. Management Information System, Jawadekar, macgraw Hill, N.D.
3. Management Information System, Lucas, macgraw Hill, N.D.
4. Management Information System, Davis, TMH
5. Information System Solutions: A Project Approach, Van Horne.TMH
6. Management Information System , O'Brien, TMH
7. Management Information System, Haag, TMH.
8. Managemnet Information System, James O' Brain, Tata McGrawHill.
9. Managemnet Information System, Dharminder Kumar/Sunita, Excel Books, Delhi.
10. Managing With Information, Jerome Kanter, Prentise Hall Of India.
11. Management Information System: managing the digital firm, laudon & laudon, pearson education.
12. Information system for modern management, Murdick, Ross & Clagget, Prentice hall/pearson

13. Business Information System, Muneesh Kumar, Vikas Publishing house.

Laboratories:--

INFORMATION SYSTEM AND SECURITIES LAB

Course/Paper: 08BCS-201
BCS Semester VIII

List of Projects are as follows (Implement any one)

1. Shopping cart project using ADO.NET: This sample project has all basic features required for a shopping cart web site including Login, Registration, Add to Cart, Checkout etc. A good ASP.NET learning project using C#, ASP.NET, SQL Server.
2. Personal Assistant: This is a small project for managing personal details. Current version of this project support Address Book feature - Add, Edit and Manage contacts and addresses using VB.NET.
3. Address Book: This is a small project for managing contact details. This is a C# version of the 'Personal Assistant' project.
4. School Management System: This is a project for managing education institutes using C#.
5. Library Management System: This is an academic project for students using Java.
6. spider Alerts & Web services: This project communicates with web services and downloads Alerts from the web server using Java & XML.
7. Patient Information System: This software can be used to keep track of the patients' information and treatment details in a hospital or clinic. Some of the advanced features include patient consulting, lab information, billing etc using JSP, Servlet & JDBC.
8. Web based Address Book: This application can be used to keep track of your contacts/addresses. N Tier architecture is used to separate data layer, business layer and UI layers.

VLSI DESIGN LAB

Course/Paper: 08BCS-202
BCS Semester VIII

Simple Design exercises:

01 Half adder, Full adder, Subtractor Flip Flops, 4bit comparator.
02 Parity generator
03 Bit up/down counter with load able count
04 Decoder and encoder
05 8 bit shift register
06 8:1 multiplexer
07 Test bench for a full adder
08 Barrel shifter
09 N by m binary multiplier
10 RISC CPU (3bit opcode, 5bit address)

TOOLS :

Xilinx Tools/ Synopsis Tools/ Cadence Tools/ Model SIM/ Leonardo Spectrum Tools/VIS/SIS Tools to be used.

X-WINDOWS PROGRAMING LAB

Course/Paper: 08BCS-203
BCS Semester VIII

1. To understand x-windows, x-lib, x-toolkit and x network protocol and learn it's commend line argument.

Programs in C/C++ language.

2. Write a program to establish connection with x server and get the sender and protocol information.

3. Using X library of the server, write a program to create a new window of a given size, title, border, foreground and background
colors.

4-5 To implement keyboard event handling/marking using x library.

6-7 To implement mouse event handling/marking using x library and interface with windows managers and drawing applications.

8. To implement a multiple windows application.

9-10 To implement various drag and drop based GUI components in Visual Basic.

11-12 To implement various drag and drop based GUI components in Motif and Lesstif.

PROJECT STAGE-II

Course/Paper: 08BCS-204
BCS Semester VIII

Here students have to submit detailed project report with there implementation in external viva as well as internal viva.

SEMINAR

Course/Paper: 08BCS-205
BCS Semester VIII

Here students have to submit a synopsis of recent topic in research and on approval they have to submit detailed report and give viva both in external and internal examination.

BUSINESS POLICY AND STRATEGIC MANAGEMENT (COMPULSORY PAPER)

Course/Paper: 09BMD101
MBA Semester-IX

Objective:
The objective of the course to equip the students with analytical tools for Cracking case studies by scanning the business environment and coming to a decision. The students will benefit by acquiring new ways and means of developing strategic decision-making skills.

Section-A
Business policy-evolution of the concept. Difference between business policy and strategic management. Corporate governance- concept, issues, models, evolution and significance.

Introduction to Strategic Management-Concept importance of strategic Management, types of Strategy. Strategy & Competitive Advantage, Strategy Planning & Decisions, strategic Management Process.
Establishing company direction-developing strategic vision, setting objectives and crafting a strategy-Internal, Operating & External Environment, Formulating Long Term objective & Strategy, Strategic Analysis & Choice. Industry and competitive analysis, strategy and competitive advantage, Principles of Competitive Advantage-Identifying Value Activities, Competitive Scope and the Value Chain, the Value Chain and Generic Strategies, Mergers & Acquisitions Strategies.
Strategy Implementation & Structure of strategy, Resource Management and Control, Ethics, Public Values & Social Responsibility
Strategy Evaluation & Control.

Section-B
Case Study.

References:

7. Strategic Management, P.K.Ghosh, S.Chand New Delhi.
8. Business Policy & Strategic Management, Dr. S.S. Chawhan, Proff. B.K.Garg. ABD
9. Business Policy & Strategic Management, Azahar Kazmi, TMH N.D..
10. Strategic Planning Formulation of Corporate Strategy, Ramaswamy & Namakumari, Macmillian N.D.
11. Business Policy & Strategic Planning, Tauch & Glueck, Frank Bros & Co
12. Cases in Strategic Management, Amita Mital, Tata Mc Graw Hill.
13. Cases in Strategic Management, Budhiraja, Tata Mc Graw Hill.

Business policy & Strategic Management, Nair, Banerjee & Agarwal, Pragati prakashan

OPERATIONS AND PRODUCTION MANAGEMENT

Course/Paper: 09BMD102

MBA Semester-IX

Objective:
The Course is designed to acquaint the students with decision making in: Planning, scheduling and control of Production and Operation functions in both manufacturing and services; Productivity improvement in operations thought layout engineering and quality management etc; Effective and efficient flow, replenishment and control of materials with reference to both manufacturing and services organizations.

Section-A
Operation Management-Introduction. Operation Research and operation strategy, forecasting demand and Linear regression, transportation and assignment problems, allocation of resources.
Nature and Scope of Production Management- process planning and design Facility Location; Types Manufacturing Systems & Layouts; Layout Planning and Analysis Material Handling-Principals-Equipments, Line Balancing-Problems Operations decisions-Production Planning and Control -In Mass Production in Batch/Job Order Manufacturing.
Capacity Planning -Models, Process Planning-Aggregate Planning-Scheduling Maintenance Management Concepts-Work Study, Method Study, Work Measurement, Work Sampling Work Environment-Industrial Safety; Computer aided Manufacturing (CAM), Artificial Intelligence & expert systems.
Material Management -an Overview, production control, storage and retrieval System. Inventory Control- JIT. Network Techniques-Simulation Concept of total Quality (TQ). International Quality Certification and other standards and their applicability in design manufacturing Humanistic and Marketing Aspects of TQ. Total Quality of services. Total

Quality and safety. ERP and Business process engineering maintenance Management, project management-PERT & CPM.

Section-B
Case study.

References:

1. Operation Research : Introduction, Taha,Handy A, Delhi, Pearson Education
2. Operation Research - Theory & Applications, J.K.Sharma, Macmillian India Ltd. N.D
3. Production & operation management, S.N.Chary, TMH
4. Production & operation management, Ranjit Singh, Jaipur Publishing.
5. Operation & production Management, K. Aswathapa, Himalaya publication.
6. Operation Research, S.D. Sharma, Kedar Nath & Ram Nath.
7. Production & Operation Management, Nair, Banerjee & Agarwal., Pragati prakashan.

RESEARCH METHODS IN MANAGEMENT

Course/Paper: 09BMD103
MBA Semester-IX

Objective:
The objective of the course is to enable the students, in developing the most appropriate Methodology for their research studies and to make familiar with the art of using different research methods and techniques. To understand the concept and process of Business research in business environment. To know the use of tools and techniques for exploratory, conclusive and causal research. To understand the concept of measurement in empirical systems & its validity and reliability. To use statistical Techniques for analysis of research data. To realize the applications of Business research

Section –A
Concept of Scientific Enquiry - Formulation of Research Problem Hypothesis Building Characteristic and Testing, Review of Literature, Research Design-Exploratory, Descriptive and Experimental research Design. Qualitative Research Design. Data Collection -Sources, Constructing a questionnaire. The Interview, Observation and Survey. Sampling Decisions, Probability and Sampling.
Parametric and Nonparametric test, level of Significance, using software for analysis Grouping and displaying data to convey meaning: Tables and Graphs, measures of Central tendency and dispersion in frequency distributions, Probability distributions, and Testing hypotheses One sample test and two sample tests, chi-square and analysis of variance, Simple regression and correlation, Non-Parametric methods - the sign test for paired data, the rank sums test. The mann-whittney U test, the one sample Runs test, rank correlation.
Attitude Measurement- Motivational Research, Focus Group; Scaling Techniques- Socio Metric and Rating Scale, Scalograms, Internal Consistency Scales. Report Writing Organization Presentation, Bibliography and References.

Section-B
Cases and Problems.

References:

1. Business Research Method, Cooper Schindler, TMH
2. Research Methodology, C.R.Khothari, New Age Publisher
3. Marketing Research, Beri, TMH
4. Research Methods, Susmit Jain.
5. Marketing Research – Text & Cases, Nargundkar, TMH.
6. Marketing Research within a changing, Hair, TMH.

7. Research Methods For Business: A Skill Building Approach, Sekaran, Wiley, India.

SUMMER TRAINING PROJECT REPORT

(COMPULSORY MAJOR PAPER I)

Course/Paper: 09BMD104
MBA Semester-IX

Objective:
The summer training project report will be evaluated on internal and external basis.
Evaluation and presentation of the report will be done by internal and external Examiners. The student will submit written report and make an oral presentation before a panel of internal examiner (Director/ principal of the institute or his or her nominee) and external examiner (to be appointed by director/principal of the institute from a panel proposed by the board of studies and approved by the vice chancellor of BU.) The assessment of the report and its presentation will be jointly done by the internal and external examiner.

GROUP A - FINANCE

INTERNATIONAL FINANCIAL MANAGEMENT

Course/Paper:**09BMD105**
MBA Semester-IX

Objective:
The new economic environment has changed the total concept of business in the country. Financial markets of the world are increasingly integrating. Financial opportunities have increased manifold across markets. Almost all products and services face global competition. To introduce the environment of international finance and its implications on international business. To explore the sources of long term finance and design financial strategies. To integrate the global developments with the changing business environment in India.

Section A
International financial management: Genesis international flow of funds. Developments in international monetary system, Emergence of multinational financial management.
Balance of payment. Risk: political and country risk. Raising capital: Domestic & International Introduction of Financial Management: Functions, Profit V/S Wealth Principle, Foreign Direct Investment.
Parity conditions in International Finance- Purchasing Power Parity, Covered Interest Parity, Real Interest Parity, Parity Conditions and Managerial Implications. Analysis of International Capital Budgeting, Cost of Capital of a Foreign Investment, International financing and investment strategies, managing short term assets and liabilities. Country Risk Analysis.

Section B
Case and Problems

References:

1. Multinational Financial Management, Shapiro, PHI N.D.
2. International Financial management, Madhu vij, Excel books, N.D.
3. International Finance, Thomas J. O'Brien.
4. International Financial Management, Apte, Tata Mc Graw Hill.
5. International Financial Management, Eun, Tata McGraw Hill.

GROUP B - MARKETING

INTERNATIONAL MARKETING

Course/Paper:**09BMD106**
MBA Semester-IX

Objectives:
To develop an integrated understanding of International marketing aspects for devising and implementing Global Marketing Strategies.

Section A
An Overview to International Business and Trade Theories - Introduction to Marketing Communication, Free Trade v/s Protection, Classical, Modern Theories, Gain and Terms of Trade.
International Business Management - The Economic Environment, Social & Cultural, Political Legal and Regulatory Environment, Competitive Advantage in Global Environment, Market Entry Expansion and Partnership.
International Finance & Institutional Systems - Foreign exchange, Balance of payments, Importing and Exporting, Trade Blocks, International Monetary Fund & World Bank, The Triad and other manner.
Strategic issue for international Marketing - Marketing Information System & Research, Segmentation, Targeting & Positioning, Planning process.
International Marketing Mix Elements - Product Decisions, Pricing Decisions, Marketing channel & place Decision Promotion decisions, Organizing & Controlling.

Section B

Case and Problems

References:

1. International Marketing, Yuvraj
2. International marketing, Kothari, Jain, Rbd.
3. International Marketing, Cateora, Tata Mc Graw Hill.
4. Global Marketing, Johansson, Tata Mc Graw Hill.
5. International Marketing, Paul, Tata Mc Graw Hill.

GROUP C - HUMAN RESOURCE MANAGEMENT

STRATEGIC HUMAN RESOURCE MANAGEMENT

Course/Paper:**09BMD107**
MBA Semester-IX

Objectives:
The purpose of this course is to Understand Strategic HRM, Aligning HR systems with business strategy, Strategy formulation, Strategies for performance and development with knowledge of global economy factors. The score card approach is also gaining its importance.

Section A
Understanding Strategic HRM: Traditional vs. strategic HR, Typology of HR activities, “best fit” approach vs. “best practice” approach, HR strategy and the role of national context, and organizational context on HR strategy and practices, investment perspective of human resources.
Aligning HR systems with business strategy: Sustained competitive advantage - how HR adds value to the firm - HR as scarce resource – non-substitutable resource, linking HRM practices to organizational outcomes – assessing and reducing costs – behavioral impact of HR practices –linking strategy to HRM practices – corporate HR philosophy and company wide HR standards – HRM leading strategy formulation.

HR Strategy in work force utilization: Efficient utilization of human resource – cross training and flexible work assignment – work teams – non unionization, strategies for employee shortages, strategies for employee surpluses. Strategies for performance and development: Typology of performance types – marginal performers – under achievers – stars – solid citizens, managing employee ability – recruitment and selection strategy typology, incentive alignment, psychological contracting.
Evaluating HR Function: Overview of evaluation – scope – strategic impact – level of analysis – criteria – level of constituents – ethical dimensions, quantitative and qualitative measures – out come and process criteria, balanced score card perspective, bench marking, accounting for HRM – purpose of measuring cost and benefits of HRM – approaches to HRM performances – employee wastage and turn over rates – cost of absenteeism – measuring human resource cost.

Section B
Case and Problem

References:

1. Strategic Human Resource Management, Rajiv Lochandhar, Excel books, N.D.
2. Human Resource Strategy A Behavioral perspective for the general Manager, George Dreher, Thomas w Dougherty. Tata Mc Graw Hill.
3. Human Resource Strategy, James W Walker, Tata Mc Graw Hill.
4. Human Resource strategy, Dreher, Tata Mc Graw Hill.
5. Strategic Human Resource: Frameworks for general managers, Baron,Wiley India.
6. Strategic Human Resource management, Schuler, Wiley India.

GROUP A - FINANCE

INVESTMENT MANAGEMENT & SECURITY ANALYSIS

Course/Paper: 09BMD108
MBA Semester-IX
Objective:
The focus of Security Analysis is on how others analyze your company's securities on their own. Whereas, that of Portfolio Management is on how investors analyze your company's securities in comparison with other's on the security market. The course is designed with a view: _To acquaint the students with the working of security market and principles of security analysis; and _To develop the skills required for portfolio management so as to be able to judge the competitive position of firms in capital market and review the related business decisions.

Section A
The Role of Security Markets in Economy. The Organization and Mechanics of Indian Security Markets- Various Securities and their Characteristics, Objective of the Security Analysis, functions of an Organized Security Market, Mechanics of Security Trading.
Various Types of Security Markets and their Functions- Stock Exchanges, Depository. Role of SEBI with regard to Secondary Markets. Capital asset pricing model, arbitrage pricing theory, efficient market hypothesis, technical and fundamental analysis. Concept and trends of savings and investment in India. Stock market: concept, functions, regulations, working and reforms. Instruments of mobilizing investment: Types and characteristics. Comparison of investment options. IPO and secondary markets: reforms and trends, trading mechanism: on line trading, settlement period. Transaction cost in secondary markets, clearing settlement and depositories, integration of stock exchange and consolidation of intermediaries, listing requirements.

Section B
Case and Problems

References:

1. Investment Management & portfolio management, V.K. Bhalla,
2. Security Analysis & portfolio Mgmt., Punithavan Pandian
3. Security Analysis & Investment Management M.R.Agarwal, Garima Publication.
4. Investment Managemnet, Aswathappa, Himalaya Publication.
5. Investment : An Indian Perspective, Bodie & Mohanty
6. Investment : Analysis & Behavious, Hirschey, Tata McGraw Hill.

GROUP B - MARKETING

ADVERTISING MANAGEMENT

Course/Paper: 09BMD109
MBA Semester-IX

Objectives:
The objective of this course is to develop the understanding about the marketing communication tools and implement them in designing Advertisement strategies.

Section A
Introduction of Marketing Communication-Overview of marketing communication, Factors affecting the marketing communication mix, Integrated Marketing Communication, Ethical issues in marketing communication. Marketing Communication Planning-Models of marketing communication, Developing & control of marketing communication, marketing communication-planning procedure. Advertising objectives and planning - Meaning Definition and objectives of Advertising, Types of advertising, The advertising agency: Function & types, Advertising Agency compensation Creative strategy - Target market & creative objective, advertising Appeals, Creative format & creation stage, Copy testing and diagnosis.
Media planning & promotion - Environment analysis media object, Media strategy & media planning modes, Indoor media, out door media, Measuring Advertisement Performances, Current developments in advertising.

Section B
Case and Problems

References:

1. Advertisement Management, Batra & others, PHI N.D.
2. Advertisement Management(In Indian Perspective), P.K.Agarwal, Pragati Prakashan.
3. Advertising Sales Promotion & CRM , P.K.Agarwal, Pragati Prakashan.
4. Advertisement Management: Concepts & Cases, Mohan, Tata Mc Graw Hill.
5. Advertising & Promotion, Belch, Tata McGraw Hill.

GROUP C - HUMAN RESOURCE MANAGEMENT

TRAINING AND DEVELOPMENT

Course/Paper: 09BMD110
MBA Semester-IX

Objective:
The Purpose of this paper is to provide an in-depth under-standing of the role of training in the HRD and to enable the course participants to manage the Training system and processes.

Section A
Introduction to Training & Development - Training and Training needs Assessment, Training Design and Administration, Training methods, Technique & Aids, Training Strategy Performance Appraisal & Training - Learning through training, Adult Learning (Andragogy), Learning theories and learning Curve, Learning Styles
Training Process: An Overview; Role Responsibility and Challenges to Training Managers; Organization and Management of Training Function; Training Needs Assessment and Action Research; Instruction Objectives and Lesson Planning; Learning Process; Training Climate and Pedagogy; Developing Training Modules.
Trainer & Training Institutions - Trainers Profile, Types of Training Institutions, Trainer as a change Agent, MDP.
Evaluation of Training - Training evaluation & ROI, Trainer of Training, Measurement Tools & Technique, Feedback Mechanism Training Methods and Techniques: Facilities Planning and Training Aids; Organizing the training Department, controlling training, Training Communication; Training Evaluation;
Training and Development in India.

Section –B
Case Study.

References:

1. Training Instruments for HRD & O.D., Udai Pareek, Tata Mc Graw Hill.
2. Employee Training & Development, Raymond A Noe, The Ohio State University, Tata Mc Graw Hill.
3. Training in Practise, Stephen Truelove, Tata Mc Graw Hill.
4. Employee Training & Development, Noe, Tata McGrawHill
5. Training & Development, Janakiram, Wiley India.

SOCIAL RESPONSIBILITY & BUSINESS EHICS & LAW

Course/Paper: 10BMD101
MBA Semester-X

Objective:
This course aims at helping students think about some of the important ethical Implications of the day-to-day happenings and practices of Indian industry and business. It is designed to stimulate discussion and debate rather than to formulate principles, and to raise further questions rather than to dictate answers. The following objectives are underlined: To improve ethical reasoning by correlating moral concepts to business practices - clarification of the values that determine managerial behavior To sensitize the fundamental human values in analyzing social problems and appraising global issues. To recognize the variables in most ethically complex business situations through an understanding of the more subtle criteria for making sound decisions.

Section- A
The Concept: The dream of an Indian Style of Management, Abiding Values is Universal, Individualistic: Rational Brain Vs Holistic-Spiritual Brain. Total Quality Mind for Total Quality Management: The Imperative of Human Values. Group Ethics- Ethical Attitudes of Indian Managers, Managers Facing Unethical Management,
Ethics & the Organization: Unity: The Basis of Ethics, Science & Ethics, Technology & Ethics, Business Ethics, Normative Ethics, Managing Ethics, Cooperative Ethics, Indian Ethos for Management.
Relevance of Gita to Modern Management.

Business Law

Indian Contract Act, 1872-Essential Elements of Contract, Void Agreements; Breach of Contracts & Remedies, Amendments. Negotiable Instruments. Act, 1881-Promissory Notes, Cheques, Bills of Exchange Sale of Goods Act, 1930-Contract of Sale, Transfer of Property; Sale by Non-Owner, Performance of Contract. Indian Company's Act, 1956-Meaning and Nature of Company, Kinds of companies, Registration and Incorporation, Share and Share Capital.

Section –B

Case study

References:

14. Business Ehics & indian ethos, Dr. G.N. Purohit Dr. Gaurav Bissa, Ajmera Book depot.
15. Business Law & regulatory framework,Dr. S.S.Chawhan & Mohit Sharma,ABD..
16. Business law, Dr. R.L.Nolakha, Ramesh Bk Depot
17. Company law, S.S.Gulshan, Excel Books.
18. Business Ethics, Ronald D Francis, Mukti Mishra, Tata Mc graw Hill.
19. Perspectives of Business Ethics, Laura Hartman & Abha Chatterjee. , Tata Mc graw Hill.
20. An Introduction to Business Ethics, Joseph Des Jardins, Tata Mc Graw Hill.
21. Indian Ethos & Values of Managers, Khandelwal N.M., Pragati Prakashan

Project Management

Course/Paper: 10BMD102
MBA Semester-X

GROUP A – FINANCE

MANAGEMENT OF FINANCIAL SERVICES

Course/Paper: 10BMD103
MBA Semester-X

Objective:

In The Fast Changing Scenario of the Indian Economy, With Deregulation, Competition, Free Market Orientation, And Globalization flows And Outflows of Funds Increased and the FFIs and FIIs have started operations in the Indian financial markets. This course shall enable the student to look into the various perspectives and understand the importance.

Section A

Introduction to financial services marketing: Concept of financial services, financial services and GDP, reforms in financial sector, recent issues and challenges in financial services in India. Indian financial system: an overview of Indian financial institutions, types of financial services – fund and fee based. An overview of the different activities performed by a bank. Risk in financial services and changing perception of intermediaries regarding financial services.

Capital markets: government securities market, monetary money market.

Merchant banking: nature and scope, regulation, overview of current Indian merchant banking scene-structure of merchant banking industry, primary market in India and abroad, SEBI guidelines, pricing and timing of public issues, pre-issue management-advertising and marketing, post issue management-rights issues.

Introductory, conceptual, evaluation, marketing and legal aspects of the following financial services: Lease, Hire purchase, consumer finance, factoring, bill financing, credit cards.

Section B
Case and Problems

ReferencEs:
1. Financial Markets & Services, Gorden Natrajen, Himalaya Publication
2. Marketing of Fianacial Services, jain rathi thakur solanki, RBD, jaipur.
3. Financial Services, tripathy, PHI.
4. Financial Institutions & markets, kohn, oxford.
5. Financial markets & financial services, vasant desai, Himalaya publication.

GROUP B - MARKETING
SALES & DISTRIBUTION MANAGEMENT

Course/Paper: 10BMD104
MBA Semester-X

Objectives:
To provide an understanding of the concepts, attitudes, techniques and approaches required for effective decision making in the areas of Sales and Distribution. To pay special emphasis on the practicing manager's problems and dilemmas. To develop skills critical for generating, evaluating and selecting sales and distribution strategies.

Section A
The Sales Management - Introduction to sales management and sales organization, Sales function & policies, Personal selling - nature, scope & objectives, Formulating Personal selling strategy.
Planning the Sales Effort - Sales planning and Budgeting, Estimating Market Potential and Sales forecasting, Setting the sales territory & quotas, Sales and cost Analysis.
Organizing and Directing the sales Force - Recurring and training sales personnel, Designing & compensating sales Personnel, Motivating and Leading the sales force, Evaluating sales force performance.
Distribution Management - Managing marketing logistics & channels, Channel Integration - VMS, HMS, Channel Management, and Marketing channel Policies & legal issue.
Channel Institutions & control, Wholesaling &- Retailing, Channel Information systems, Managing & Evaluating Channel Performance Case & future trends in sales & distribution management.

Section B
Case and Problems

References:
1. Sales Management, Still & Cundiff, Pearson Pentrice Hall.
2. Sales & Distribution Management, Hawalder, TMH.
3. Sales & Distribution Management,Panda.
4. Sales & Distribution Management, G.S. Sudha. RBD.
5. Sales & Distribution Management, Nair, Banerjee & Agarwal, Pragati Prakashan.
6. Sales & Distribution Management, P.K.Agarwal, Pragati Prakashan.

GROUP C - HUMAN RESOURCE MANAGEMENT

LEADERSHIP SKILLS AND CHANGE MANAGEMENT

Course/Paper: 10BMD105
MBA Semester-X

Objectives:
The course will let the student understand the impact and importance of becoming a leader, effective leadership behaviour and styles. Understanding the change, its role and implementation

Section A
The nature and importance of leadership: The meaning of leadership – leadership as a partnership – leadership vs. management – the Impact of leadership on organizational performance – leadership roles – the satisfactions and frustrations of being a leader. Traits, Motives, and characteristics of leaders: Personality traits of effective leaders' leadership motives-cognitive factors and leadership.
Effective leadership behaviour and attitudes: task-related attitudes and behaviours – relationship-oriented attitudes and behaviours – super leadership: leading others to lead themselves – 360-degree feedback for fine-tuning leadership approach.
Leadership styles: the leadership continuum: classical leadership styles – the boss-centered vs. employee-centered leadership continuum – the autocratic participative free rein continuum- the leadership grid styles – the entrepreneurial leadership style – gender differences in leadership style – selecting the best leadership style.
Understanding change: nature of change – forces of change – perspective on change: contingency perspective – population ecology perspective institutional perspective – resource-dependence perspective
Types of change: continuous change – discontinuous change – participative change – directive change. Implementing change: assemble a change management team – establish a new direction for change – prepare the organization for change ,systems and resources to support change – identify and to remove road blocks to change – absorb change into the culture of the organization

Section B
Case and Problems

References:

1. Leadership: Enhancing The Lessons of Experience, Richard L Huges, Robert c Ginnette, Gordon J Curphy, Tata McGraw Hill.
2. Leaders & the leadership process, Jon Pierce & John Newstorm, Tata McGraw Hill.
3. Art of Leadership, George Manning, Kent Curtis, Tata McGraw Hill.
4. Leadership, Hughes, tata Mc Graw Hill
5. Leadership Research Findings, Practise & Skills, DuBrin, Wiley India.
6. Practising Leadership Principles & Applications, Shriberg, Wiley, India.

GROUP A – FINANCE

FINANCE FOR STRATEGIC DECISIONS

Course/Paper: 10BMD106
MBA Semester-X

Objective:
The modern industrial or service firm must conduct its business in a rapidly changing and highly competitive environment. A premium is placed on the ability to react quickly and correctly to constantly changing market conditions. The objective of the course is to make student aware of the strategic decisions to be undertaken to familiarize with finance function.

Section A
An Overview of the Financial System- Saving and Investment, Money, Inflation & Interest, Banking and Non Banking Financial Intermediaries.

Financial Markets and Instruments- Money market and Capital Markets, Financial Instruments: REPO, Equities, Bonds, Derivatives etc. Characteristics of Financial Instruments:
Central Banking, Monetary Policy & Regulation- The RBI as a Central Bank: Structure, Functions and Working, Reforms, the Current Regulatory Structure. Concept of strategic decisions-changing global economic environment. Theory of Merger & Accuisitionn. Strategic decisions regarding securitization factoring and forfeiting,

Section B
Case and Problems

References:

1. Finance for Strategic Decision, Jain & Rathi, RBD.
2. Financial Markets & Corporate Strategy, Grinblatt, Tata McGraw Hill.
3. Capital Markets, GuruSamy, TataMc Graw Hill.
4. Financial Services, Guruswamy, Tata McGraw Hill.

GROUP B - MARKETING

PRODUCT & BRAND MANAGEMENT

Course/Paper: 10BMD107
MBA Semester-X

Objectives:
To help the students appreciate the relationship between Corporate Strategy and Product and Brand Management. To equip the students with the various dimensions of product management such as product-line decisions, product platform and product life cycle. To provide a framework to understand the new product development process, the organizational structures for new product development and product management functions within an organization-To explore the various issues related to Brand Management and to enhance the understanding and appreciation of this important intangible strategic asset including brand associations, brand identity, brand architecture, leveraging brand assets, brand portfolio management etc.

Section A
Introduction to Product Management - What is Product & Product - Service Continuum, Individual Product Decisions, Product attributes, Product and product Lives, Special issues in Product Management - Product Life cycle & Strategy, Product Differentiation, New Product development.
Introduction to Brand Management and Crafting of Brand Elements. Consumer Brand Knowledge. Brand Identity, Personality and Brand Associations. Managing Brand Architecture and Brand Portfolios. Corporate Branding and Tools for Building Brand Equity. Leveraging Brand Equity. Measurement of Brand Equity.
Brand as a Concept - Value & Significance of Brand, Brand Name, Symbol & Slogan, Brand Strategic Decision, Line Expensing & Brand Extension
Concept of Brand Equity & Association - Brand Loyalty; Awareness, Creating and Managing Brand Equity, Selecting, Creating and Maintain Associate.
Brand Strategic - Brand Rejuvenation, Brand Relations, Brand Proliferation, Multi Branding, Global Brand.

Section B
Case and Problems

References:

1. Managing Indian Brands, Ramesh Kumar, Vikas Pub. N.D.
2. Product & Brand Management, Sharma Pareek, Ramesh Book Depot.
3. Product Development &Design, tarun soota, Pragati Prakashan.

4. Product Management, Anandan, Tata Mc Graw Hill.
5. Product Management, Lehmann, tata mc graw hill.
6. Product Design & Development, Ulrich, Tata Mc Graw Hill.

GROUP C - HUMAN RESOURCE MANAGEMENT

HUMAN RESOURCE PLANNING

Course/Paper: 10BMD108
MBA Semester-X

Objectives:
To understand the purpose, process and applications of human resource planning in the context of different organizational strategies. To create a critical appreciation and knowledge of understanding the determinants of human resource requirements. And the means for meeting those requirements. To create practical awareness about the current trends in human resource planning in global companies.

Section A
Introduction: definition and concept of HRP, benefits, process. HRP components.
HR planning and corporate strategies: HR planning as a strategic process-employees as resources-goal attainment, linking HR process to strategy, involvement in strategic planning process, strategic HR Planning model, staffing system.
Job analysis: meaning and definition, job analysis process, techniques of job analysis, methods and practice of job analysis, competency based approach.
HR Forecasting: Forecasting Manpower Needs, the Forecasting Process, Inventorying available talent, Projecting Future Talent Supply, forecasting Staffing Requirements. Index analysis-expert forecasts-delphi technique-nominal group technique-HR budget and staffing table, scenario forecasting, regression analysis.
Career planning and succession management: definitions, concepts, stages of career development process and organizational HR Policies, career processes Succession management process and Management development programmes, objectives of MDP's, Job rotation, Auditing MDP's management development methods, challenges of succession management, Replacement analysis.

Section B
Case and Problems

GROUP A – FINANCE

BANKING SERVICES & OPERATION

Course/Paper: 10BMD109
MBA Semester-X

Objective:
The objective of the course is to develop the skills required for understanding India's most challenging and important financial services sector. Banking services operation will enable the management student to have an insight to the banking sector and how it works.

Section A
Indian financial system: the financial system – nature – evolution and structure – the functions of financial intermediaries – financial instruments – the role of financial system in economic development the Indian financial system.
Deposit products: types of bank deposits, deposit schemes, composition of bank deposits. Credit policy: Need for credit policy, credit policy components of credit policy, credit policy pursued by the government. Retail banking: basics of retail banking, forms of retail banking. Corporate banking: The nature of corporate banking, loan syndication.

Rural banking and Micro finance: sources of rural finance, credit delivery mechanism in rural finance to co-operative agricultural and rural development banks (CARDB) – regional rural banks (RRBS), service area approach (SAA) – National Bank for Agriculture and Rural Development (NABARD), microfinance.
Fee-based services: the fee-based services of banks, letter of credits, bank guarantees.
Introduction to banking operations: Importance of customer relationship management in banks – different types of products and services offered to customers – role of technology in banking operations Introduction to electronic banking.

Section B
Case and Problems

References:

1. Banking Service & Operation, Jain & Rathi Sharma, RBD, Jaipur.
2. Banking theory Law & Practise, Gurusamy, Tata Mc Graw Hill.
3. Merchant Banking & Financial services, Gurusamy, Tata Mcgraw Hill.
4. Banking & Financial System, B.L.Ojha, Ajmera Book Company.
5. Financial Services, M.Y.Khan, Tata Mc Graw Hill.

GROUP B - MARKETING

MARKETING OF SERVICES

Course/Paper: 10BMD110
MBA Semester-X

Objectives:
Planning and implementing the marketing strategy for service products requires a different sort of approach, which is different from the traditional goods marketing. The objective of this course is to acquaint the students to the uniqueness of the services characteristics and its marketing implications. The intent of the course is to discuss measure and analyze several facets in the area of services marketing essential for the success of a service sector firm.

Section A
Introduction to Service Marketing - Understanding Service, The Nature of Service Marketing, Classification of service. Service Consumer Behavior - Understanding Consumer Behaviors, Customer expectations & perceptions, managing & exceeding customer service exportations, Strategic for influencing customer perception.
Strategic Issues in Services Marketing - Market Segmentation & Targeting; Individualized Service and Mass Customization, Differentiation and Positioning of Services; Steps in developing a positioning strategy, Developing and maintaining demand & capacity.
The marketing mix and services - The marketing mix dements, Traditional marketing mix - Product, price place, promotion & communication services, extended marketing mix – people, process physical evidence in services.
Challenges of service marketing - Developing & managing the customer service function, Marketing planning for service; Developing & maintain quality ill services, Relationship marketing, Service marketing - specific Industries, Tourism, Travel, Transportation service marketing, financial services; Education & Professional service, Telecom & Courier, Media Service.

Section B
Case and Problems

References:

1. Service marketing, Lovelock, Pearson Education N.D.
2. Services Marketing: Text & Cases, Nargundkar, Tata Mc Graw Hill.
3. Service Marketing, Zeithaml, Tata Mc Graw Hill.

GROUP C - HUMAN RESOURCE MANAGEMENT

PERFORMANCE MANAGEMENT & RETENTION STRATEGIES

Course/Paper: 10BMD111
MBA Semester-X

Objectives:
The objective of this paper is to introduce the basic concept of performance management and to widen the knowledge of the students in selecting and implementing the various performance measurement methods for better designing of reward system associated with it.

Section A

Performance Appraisal – A Conceptual Framework, Concept & Definitions of performance appraisal, and Objectives of performance appraisal: Process of performance appraisal, Performance Appraisal v/s Performance Management System, Concept of performance management, Process & elements 0f performance management.
Behavioral Performance Management - Learning Theories; Principles of Learning: Reinforcement and Punishment, Role of Organizational Reward Systems, Behavioral Performance Management or OB Mod.
Potential Appraisal & HRD - Meaning & objectives of Potential Appraisal, Potential Appraisal & Performance Appraisal, Concept of HRD; Objectives and challenges of HRD Mechanisms and HRD outcomes.
Performance Planning & Measuring Performance - Meaning & need or Performance Planning, Planning Individual Performance, Principles of Measurement.; Classification of Performance Measures, Measurement issues; Approaches &: tools to measure organizational performance, Traditional and modern performance appraisal methods
Competency Analysis and Competency Mapping - Meaning of competency, Competency Analysis and Approaches to competency Analysis, Competency mapping; Need development and assessment of competency models, Competency and performance, Tools to identify the competencies of the employees.

Section B

Case and Problems

References:

1. Performance management, Dixit Varsha, Vrinda Publication.
2. Performance Appraisal & Compensation Management: A Modern Approach, Goel, PHI.