

SCHEME OF INSTRUCTION & EXAMINATION**MCA I YEAR****Faculty of Information Technology****With Effect from Academic year 2006-2007****SEMESTER- I**

S. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L/T	D/P		Univ, Exam	Sessionals
THEORY							
1	CS601	Discrete Mathematics	4	-	3	80	20
2	CS602	Probability and Statistics	4	-	3	80	20
3	CS603	Computer Programming Using C++	4	-	3	80	20
4	CS604	Elements of Information Technology	4	-	3	80	20
5		Elective-I (Any One)	4	-	3	80	20
	CS605	Modern Economic Analysis					
	CS606	Elementary Mathematics					
PRACTICALS							
1	CS631	Programming Lab-I(C++ Programming)	-	3	3	50	25
2	CS632	Programming Lab-II(ELT Lab)		3	3	50	25
	Total		20	6		500	150

DISCRETE MATHEMATICS

CS 601

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Mathematical Logic: Statements and notation, connectives, Normal Forms, Disjunctive Normal Forms (DNF), Conjunctive Normal Forms (CNF), Principal DNF, Principal CNF.

Set Theory: Basic Concepts of Set Theory, Relations and Ordering, Functions and Recursion.

UNIT -II

Lattices, Boolean Algebra, Representation and Minimization of Boolean functions.

Semi-groups, Product and Quotients of Semi-group, Groups, Product and Quotients of Groups, Coding of Binary Information and Error Detection, Decoding and Error Correction.

UNIT -III

Combinatorics: Basics, Permutations and Combinations with repetitions and Constrained Repetitions, Binomial and Multinomial Theorems, Principle of Inclusion and Exclusion.

UNIT -IV

Graph Theory-I: Basic Concepts, Isomorphism, Sub-graphs, trees and their Properties. Spanning Tree, Directed Trees, Binary Trees

UNIT -V

Graph Theory-II: Planar Graphs, Euler Formula, Multi-graphs and Euler Circuit, Hamiltonian Circuit, Chromatic Numbers, Four Color Problem.

Suggested Readings:

- 1) Jr. P. Trembley and R. Manohar, "Discrete Mathematical structures with Applications to Computer Science", McGraw Hill, 1987.
- 2) Bernard Kolman, Nadeem Ur Rehaman "Discrete Mathematical Structures" Pearson Education, 2005.
- 3) J .L. Moth, Abraham Kandel and T .P .Parker, "Discrete Mathematics for Computer Scientists and Mathematicians", PHI, 1976.

PROBABILITY AND STATISTICS

MAT 602

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I

Data Validation and information abstraction: Methods of collecting data efficiently, gathering information from data charting.

UNIT -II

Probability: Laws of probability, Probability distributions, Discrete, equiprobable binomial, Poisson.

UNIT -III

Continuous distributions: Rectangular, normal, gamma and beta.

UNIT -IV

Statistical methods: Frequency distributions, mathematical expectation, moments, skewness and kurtosis.

UNIT -V

Correlation and regression, Introduction to tests of significance, u, t, x tests.

Suggested Readings:

- 1) S.C. Gupta and V.K. Kapoor, "Fundamentals of mathematical Statistics", 1989.
- 2) William Mendenhall, Robert J. Beaver, Barbara M.. Beaver, "Introduction to Probability and Statistics", Thomson Brooks/Cole, Eleventh Edition, 2003.
- 3) Richard A. Johnson, "Probability and Statistics for Engineers", Prentice Hall of India, Seventh Edition, 2005.

COMPUTER PROGRAMMING USING C++

CS 603

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I

Introduction to C++ Programming: Programming and Problem Solving – Introduction to C++, Kinds of program errors.

C++ Basics: Variables and assignments, input and output, Data types and expressions.

Functions: Void functions, Call by value parameters, Call by reference parameters, Procedural abstraction, Testing and debugging functions.

UNIT-II

Objects and Classes: Introduction to classes and objects, Streams and Basic File I/O.

Tools for stream I/O and Character I/O.

Defining classes: Structures, Classes, Abstract data types.

Flow of Control: Branching and loops.

UNIT -III

Overloading Functions, Overloading operators, Friend Functions.

Destructors and Copy Constructors.

Separate Compilation and namespaces.

Arrays: Introduction to Arrays - Arrays in Functions, Programming with Arrays, Arrays and Classes.

Strings and Multi-dimensional arrays: String Basics, Multi-Dimensional Arrays.

UNIT-IV

Pointers and Dynamic Arrays: Pointers, Dynamic arrays, Classes and Dynamic arrays.

Recursion: Recursive Functions for Tasks, Recursive Functions for Values, Recursive Design Techniques.

Templates: Function Templates, Class Templates.

UNIT -V

Inheritance: The Concept of Inheritance, Derived Classes, Redefinition of Member Functions vs. Overloading, Assignment Operators and Copy Constructors for Derived Classes, Polymorphism: Overriding and Virtual Functions.

Exception Handling: Basics, Programming techniques for exception handling.

Suggested Readings:

- 1) Walter Savitch, "Problem Solving with C++", Second Edition, Pearson Education Publishing, 2003.
- 2) Al Stevens, "C++ Programming", Seventh Edition, Wiley DreamTech, 2003
- 3) Bjarne Stroustrup, "The C++ Programming Language", 3rd Edition, Addison-Wesley, 1998.

ELEMENTS OF INFORMATION TECHNOLOGY

CS 604

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I

Digital Age: Digital basis of computers, Data/information, Hardware input, output, memory, communication hardware, software, application software, system software, communications, Five kinds of computers, development in communication technology, connectivity and interactivity.

Five Generations of Programming Languages, Programming languages used today, object oriented & visual programming.

Operating Systems: Booting managing storage, resources, files tasks, common operating systems, Windows 95/98, DOS, and Windows-NT.

UNIT -II

Processors: The CPU and main memory, Data representation, micro computer system unit, input & output devices, keyboard, pointing devices, source data entry devices, soft copy output, hardcopy output, more output devices, Diskettes, hard disks, optical disks, flash memory, magnetic tape, compression and decompression.

UNIT -III

Telecommunications: Voice, Video/Voice communication, the internet, the World Wide Web, new internet technologies. Communication channels, networks, conduits of communication, communication networks, local networks, factors affecting communication among devices.

UNIT- IV

Files & Databases: Data storage hierarchy, file management, files management systems, Database management systems, type of database organization, features of a DBMS.

Application Software: Common features of software, word processing, spread sheet, software for cyber space, Internet programming, HTML, XML, & Active X.

UNIT -V

Information Systems: Organizations, departments, tasks, management, Management information systems. Six phases of System Analysis and Design.

Software Development: Programming as a five step procedure.

Security Issues: Threats to computers & Communication systems. Safeguarding computers and communications.

Suggested Readings:

- 1) Williams B.K. Sawyer et.al., "Using information Technology", Sixth Edition, Tata McGraw Hill, 2006.
- 2) Dennis P. Curtin, Kim Folley, et.al., "Information Technology, The breaking Wave", Tata McGraw Hill, 1998.
- 3) ITL Edn Solutions Ltd. "Introduction to Information Technology", Pearson Education, 2005.

MODERN ECONOMIC ANALYSIS

CM 605

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I

The nature and scope of managerial economics, Fundamental concepts of managerial economics.

UNIT -II

Demand analysis, concepts of demand, demand elasticities.

UNIT -III

Production and cost analysis and principles: Production function, single output isoquantum, average cost curve - Laws of returns - Laws of supply, Price determination under perfect competition.

UNIT -IV

National income: Concepts, measurement and determinants.

Planning: The machinery for planning in India, Salient features of India's Five Year plans.

UNIT-V

Indian Financial Systems, Functions and role of Reserve Bank of India. Conventional Banks and Industrial Finance. Term "Lending Financial Institutions - role and functions.

Suggested Readings:

- 1) Dhiraj Bhattacharya & Pranab Chakraborti, "Fundamentals of Business Economics", A. H. Wheeler & Co. (P) Ltd., 1986.
- 2) Barry Keating, J. Holton Wilson, "Managerial Economics", Biztantra, Second Edition, 2003.
- 3) Dominick Salvatore, "Managerial Economics", Thomson, Fourth Edition, 2001.

ELEMENTARY MATHEMATICS

MAT 606

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I

Algebra: Mathematical induction, Logarithms and surds, quadratic expressions, equations and inequalities, summation of series matrices and groups.

UNIT -II

Differential calculus: Integration and simple applications.

UNIT -III

Integral Calculus: Integration and simple applications.

UNIT -IV

Vector Algebra: Vectors and scalars, vector addition, vector equations of line and plane, scalar and vector products of vectors, triple products.

UNIT-V

Trigonometry: Angles and measurement of angles, trigonometric ratios and value of a function at a certain value, compound angles, trigonometric ratios of compound angles, complex numbers and De. Moivre's theorem, Hyperbolic functions.

Suggested Readings:

- 1) BSS Murthy, Venkateswara Rao & V. Krishna Murthy, "Intermediate Mathematics- Part I and II", Chand and Co.

**PROGRAMMING LAB –I
(C++ PROGRAMMING)**

CS 631

Instruction	3 Periods per week
Duration of University Examination	3
Hours University Examination	50 Marks
Sessional	25 Marks

1. Finding maximum minimum and sum of given set of numbers.
2. Sorting programs.
3. Programs for finding the number of words, sentences in the given text as input.
4. Functions for matrix operations.
5. Recursive functions for greatest common divisor
6. Recursive Implementation of Tower of Hanoi.
7. Classes for Bank Account, Student Information, Library Catalogue.
8. Creation of Complex class with operator overloading.
9. Creation of Inheritance hierarchy for graphic shapes. .
10. Template functions for Min() and Max() for finding *minimum* and *maximum* in a list
11. Programs demonstrating pure virtual functions, multiple inheritances and exception handling.

**PROGRAMMING LAB -II
(EIT Lab)**

CS 632

Instruction	3 Periods per week
Duration of University Examination	3
Hours University Examination	50 Marks
Sessional	25 Marks

At the end of the course, students should be able to:

1. Identify and describe the relationships and role of the components of the "Logical" diagram of the computer. (e.g. processor, RAM, ROM, BIOS, input, output, storage.)
2. Relate the "logical" diagram of a computer system to the "physical" system by identifying physical components of a computer and describing their purpose. (e.g. the

- processor, memory chips, motherboard, disk drives, and controller cards such as AGP board, network cards, sound card, as well as parallel and serial ports etc) "-
3. Assemble the computer which they will use and load the OS with partitions for Windows and Linux, configure for network connection
 4. Troubleshoot his/her PC from time to time
 5. Install/Uninstall SW/HW on his/her PC from time to time
 6. Identify and distinguish between various types of application software by describing and using them. (e.g. word processor, spreadsheet, database, browser, mailers etc.)
 7. **MS Word:** Create documents with standard formatting commands, single/multi column, insert pictures/objects, drawings, hyperlinks, header/footer, and tables. No macros.
 8. **MS Power Point:** Create presentations with preset animations, using different layouts, backgrounds, slide master, insert pictures/objects, drawings, hyperlinks, header/footer, tables
 9. **MS Excel:** Creating worksheets with various kinds of data, making charts, conditional formatting, awareness of the various functions - statistical, date/time, math/trig etc, ability to explore (help) and use these functions if needed, demonstration through some common functions like sum, average, standard deviation, logical and information.
 10. **HTML:** Should be able to create their web-page (title, text, frames, hyperlinks to some sites, pictures, lists, tables, fonts and color) without using any web authoring tools.
 11. Distinguish between various commercially available systems by relating the cost to features available on each system
 12. Be able to use the following list of commands in Linux:

alias	cp	ftp	man	talk
banner	date	gv	mkdir	telnet
bc	diff	gunzip	more	unzip
bg	dir	head	mv	vi
cal	display	history	passwd	vim
cat	df	id	pine	vimtutor
cc	du	indent	ps	wall
cd	echo	dill	pwd	wait
chgrp	exit	last	reboot	whereis
chmod	fg	login	rm	who
clear	file	logname	rmdir	whoami
chfn	finger	ln	shutdown	write
chown	find	logout	tail	zip
cmp	gzip	ls	tar	ands
		mail		

SCHEME OF INSTRUCTION & EXAMINATION**MCA I YEAR****Faculty of Information Technology****With Effect from Academic Year 2006-2007****SEMESTER- II**

S. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L/T	D/P		Univ, Exam	Sessionals
THEORY							
1	CS651	Accounting and Financial Management	4	-	3	80	20
2	CS652	Object-Oriented Programming Using Java	4	-	3	80	20
3	CS653	Management Information Systems	4	-	3	80	20
4	CS654	Data Structures Using C++	4	-	3	80	20
5	CS655	Computer Organization	4	-	3	80	20
PRACTICALS							
1	CS631	Programming Lab-III(Java Programming)	-	3	3	50	25
2	CS632	Programming Lab-IV(Data Structures in C++)		3	3	50	25
	Total		20	6		500	150

ACCOUNTING AND FINANCIAL MANAGEMENT

CM 651

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I

An overview of Accounting cycle - Basic concepts and conventions - Books of Account -Terminal statement.

UNIT- II

Financial statement analysis and interpretation - Ratio analysis.

UNIT -III

Working capital -Sources and uses - Funds flow and cash flow analysis - Management of Inventory.

UNIT- IV

Capital Budgeting - Techniques for evaluation - Cost of capital - Computation of specific costs, and weighted average cost of capital

UNIT -V

Analysis of costs and their behaviour - Cost volume - Profit analysis Variable costing and absorption costing.

Budgets - Flexible Budgeting - Long and Short term forecasting.

Suggested Readings:

- 1) James. C. Van Horne, "Fundamentals of Financial Management", Pearson edition, Eleventh edition, 2001.
- 2) Khan MY, Jain PK, "Financial Management", Tata McGraw Hill, Second Edition, 1993.
- 3) Maheswari SN, "Management Accounting and Financial Control", Sultan Chand & Co.
- 4) Gupta G, Radhaswamy M, "Advanced Accountancy", Sultan Chand & Sons.

OBJECT ORIENTED PROGRAMMING USING JAVA

CS 652

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I

Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Oriented Concepts, Benefits of Object Oriented Development.

Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables and Arrays, Operators, Control Statements, Classes, Methods, Inheritance, Packages and Interfaces..

UNIT -II

Exception Handling: Multithreaded Programming, I/O Basics, Reading console input and output, Reading and Writing Files, Print Writer Class, String Handling.

UNIT -III

Exploring java.lang, Collections Overview, Collections Interfaces, Collections Classes, Iterators, Random Access Interface, Maps, Comparators, Arrays, Legacy classes and Interfaces, String Tokenizer, Bit Set, Date, Calendar observable, timer.

UNIT IV

Java I/O classes and Interfaces, Files, Stream and Byte Classes, Character Streams, Serialization.

UNIT -V

GUI and Event Driven Programming: Applet Class, Event Handling, Delegation event model, event classes, event listener Interfaces.

Customizing Frame Windows, GUI Programming Basics, Text Related GUI Components, Layout Managers, Effective use of Nested Panels, Other GUI components, Menus and Handling Mouse Events.

Suggested Readings:

- 1) Patrick Naughton, "JAVA 2, The Complete Reference", Tata McGraw Hill 2005.
- 2) James M. Slack, "Programming and Problem Solving with JAVA", Thomson Learning 2000.
- 3) C Thomas Wu, "An Introduction to Object Oriented Programming with Java", Tata McGraw Hill, 2005

MANAGEMENT INFORMATION SYSTEMS

CS 653

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT I

An Introduction to Concepts of Systems and Organizations, Strategic Uses of Information Technology, Business Process in Engineering and Information Technology

UNIT II

Applications to Operational Information Systems to Business, Tactical and Strategic Information System to Business

UNIT III

Information Systems Planning, Approach to Systems Building, Alternative Application Development

UNIT IV

Managing Knowledge, Knowledge Management in the Organization, Enhancing Management Decision Making, DSS, GDSS, ESS

UNIT V

Management of Information Systems, Information Systems Security and Control, Ethical Issues, Managing Firm Infrastructure and Enterprise System

Suggested Readings:

1. Robert Schultheis, Mary Sumner, "Management Information Systems – The Manager's View", Tata McGraw Hill, Fourth Edition, 1998.
2. Kenneth C Laudon, Jane P Laudon "Management Information Systems", Prentice Hall, 2000.
3. James A. O'Brien, "Management Information Systems", Tata McGraw Hill, Sixth Edition, 2004.

DATA STRUCTURES USING C++

CS 654

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I

Data Representation: Introduction, Linear Lists; Formula-based Representation, Indirect Addressing, Simulating Pointers, Comparisons and Applications.

UNIT -II

Arrays, Matrices, Special and Sparse Matrices

Stacks: Definitions, Operations and Applications, Array and Linked Representation of Stacks.

Queues: Definitions and Operations. Array and Linked Representation of Queues and their Applications.

UNIT- III

Trees: Definitions and Properties, Representation of Binary Trees, Operations. Binary Tree Traversal, AVL Trees and Operations on AVL Trees

UNIT -IV

Sorting: Merge Sort, Selection Sort, heap sort, Complexity Analysis, Sequential Search, binary search, various types of Hashing

UNIT -V

Graphs: Definitions and Representation of Graphs. Graphs Search Methods Applications B-Trees, Operations on B-Trees, Applications

Suggested Readings:

- 1) S Sahani, "Data Structures, Algorithms and Applications in C++", Second Edition, University Press, 2005.
- 2) D S Malik "Data Structures using C++", Thomson Learning, 2003.
- 3) Cormen Leiserson & Rivest, "Introduction to Algorithms", Prentice Hall India, 1996.

COMPUTER ORGANISATION

CS 655

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I:

Digital Logic Circuits: Digital Computers, Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits, Flip Flops, Sequential Circuits.

Digital Components: Integrated Circuits, Decoder, Multiplexers, Registers, Shift Registers, Binary Counter, Memory Unit.

Data Representation: Data Types, Complements, Fixed and Floating Point Representation, Other Binary Codes and Error Detection Codes.

UNIT -II

Register Transfer and Micro operations: Register Transfer language, Register transfer. Bus and Memory Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations and Arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycles, Memory Reference Instructions, Input, Output and Interrupts, Design of Accumulator logic.

UNIT -III

Programming the Basic Computer: Introduction, Machine Language, Assembly Language, The Assembler, Programming Arithmetic and Logic Operations, Subroutines, and Input-Output, Programming.

Micro programmed Control: Control Memory, Address Sequencing, Micro Program Example. Design of Control Unit.

UNIT -IV

Central Processing Unit: Introduction, General Register Organization, Stack Organization. Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, RISC.

Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline

Computer Arithmetic: Addition and Subtraction, Multiplication algorithms, Division Algorithms, Floating Point Arithmetic Operations, Decimal Arithmetic Unit, and Decimal Arithmetic Operations.

UNIT -V

Input-Output organization: Peripheral Devices, I/O Output Interface, Asynchronous Data

Transfer, Modes of Transfer, Priority Interrupt, DMA, Input Output Processor, Serial Communication.

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associate Memory, Cache Memory.

Suggested Readings:

- 1) M. Morris Mano, "Computer System Architecture", Pearson Asia/Prentice Hall, Third edition, 1993.
- 2) Sivarama P Dandamudi, "Fundamentals of Computer Organization and Design", Springer/DreamTech Publishers, 2003.
- 3) William Stallings, "Computer Organization & Architecture", Pearson Education, Sixth Edition, 2003.

PROGRAMMING LAB -III (Java Programming)

CS 681

1. A program to illustrate the concept of Class with Constructors, Methods and Overloading.
2. A program to illustrate the concept of Inheritance and Dynamic Polymorphism
3. A program to illustrate the usage of Abstract Class.
4. A program to illustrate Multithreading.
5. A program to illustrate Thread Synchronization.
6. A program using StringTokenizer.
7. A program using Linkedlist Class
8. A program using TreeSet Class
9. A program using Hash Set and Iterator Classes.
10. A program using Map Classes.
11. A program using Enumeration and Comparator Interfaces.
12. A program to illustrate the usage of Filter and Buffered I/O streams
13. A program to illustrate the usage of Serialization
14. An application involving GUI with different Controls, Menus and Event Handling.
15. A program to implement an Applet.

PROGRAMMING LAB-IV (DATA STRUCTURES IN C++)

CS 682

1. Implementation of Stack, Queues.
2. Infix to Postfix Conversion, Evaluation of Postfix Expression.
3. Polynomial Arithmetic using Linked Lists.
4. Implementation of Binary Search and Hashing.
5. Implementation of Selection, Shell Merge and Quick Sorts.
6. Implementation of Traversal on Binary Trees.
7. Implementation of Heap Sort.
8. Implementation of Operations of AVL Trees.
9. Implementation of Traversal on Graph.
10. Implementation of B-Tree.

SCHEME OF INSTRUCTION & EXAMINATION**MCA II YEAR****Faculty of Information Technology****With Effect from Academic year 2007-2008****SEMESTER- I**

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessionals
THEORY							
1	CS701	Data Communications	4	-	3	80	20
2	CS702	Data Base Management Systems	4	-	3	80	20
3	CS703	Interactive Computer Graphics	4	-	3	80	20
4	CS704	Operating Systems	4	-	3	80	20
5	CS705	Operations Research	4	-	3	80	20
PRACTICALS							
1	CS731	Programming Lab- V(DBMS Programming)	-	3	3	50	25
2	CS732	Programming Lab-VI(OS Lab)	-	3	3	50	25
	Total		20	6		500	150

DATA COMMUNICATIONS

CS-701

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Introduction: Communication model. Data Communication networking, Protocols and Architecture, Standards

Data Transmission: Concepts and terminology. Analog and Digital Transmission, Transmission Impairments, Transmission media.

Data Encoding: Digital Data-Digital Signals, Digital Data-Analog Signals, Analog Data-Digital Signals, Analog Data-Analog Signals.

UNIT-II

Data Communication Interface: Asynchronous and Synchronous Transmission, Line Configuration, Interfacing.

Data Link Controls: Flow Control, Error Detection, Error Control, HDLC, other Data link Control protocols, performance issues.

UNIT -III

Multiplexing: Frequency Division Multiplexing, Synchronous time-Division Multiplexing, Statistical Time-Division Multiplexing. Asymmetric Digital Subscriber Line, xDSL. Circuit Switching, Packet Switching & Frame Relay.

ATM Architecture, Logical Connection, ATM Cells, Transmission of ATM cells

UNIT-IV

Traditional Ethernet: Topologies and Transmission Media, LAN protocol architecture, MAC sublayer, CSMA/CD, Physical Layer, Implementation, Bridged, switched and full duplex Ethernets, Layer 2 and Layer 3 Switches.

Fast Ethernet: MAC sublayer, Physical Layer, Implementation

Gigabit Ethernet: MAC sublayer, Physical Layer, Implementation

UNIT -V

Cellular Wireless Networks: Principles of Cellular Networks, First Generation Analog Second Generation CDMA, Third Generation Systems,

Wireless LANs: Overview, Wireless LAN Technology, IEEE 802.11 Architecture and services, IEEE 802.11 Medium Access Control, IEEE 802.11 Physical Layer

Bluetooth: Architecture, Layers,

Suggested Readings:

1. William Stallings, "Data and Computer Communication", 7th edition, Pearson Education Asia - 2004.
2. Behrouz A. Forouzan, "Data Communications and Networking", 4th Edition, Tata McGraw Hill, 2006.
3. Fred Halsall, "Data Communications, Computer Networks and Open Systems", 4th Edition, Pearson Education, 2000

DATABASE MANAGEMENT SYSTEMS

CS-702

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT I

The Entity-Relationship Model: Overview of Database Design, Entities, Attributes, Relationships, Extended ER Model Features

The Relational Model: Introduction to the Relational Model, Integrity Constraints over relations, ER to Relational, introduction to views. Destroying/Altering Tables and views. Schema Refinement and Normal Forms: Introduction to schema Refinement, functional dependencies, examples motivating schema Refinement, reasoning about functional dependencies, normal Forms, decompositions, normalizations.

UNIT II

Relational Algebra and calculus: Preliminaries, Relational Algebra Relational calculus, expressive, power of algebra and calculus.

SQL: Queries, Programming, Triggers: SQL queries, nested queries. Joins, aggregate functions, null values, embedded SQL, cursors, Dynamic SQL, Triggers and Active database, designing active databases

UNIT -III

File Organizations and Indexes: Cost Model, comparison of three files Organizations, overview of indexes, properties of indexes.

Tree-Structured indexing: Indexed sequential access method (ISAM)

B+ Trees: A dynamic index structure, format of a node, search, Insert, delete, duplicates, B+ Trees in practice.

Hash-Based Indexing: Static Hashing, Extendable Hashing, Linear Hashing, Extendible

Hashing versus Linear Hashing

UNIT-IV

Transaction Management: The Concept of a Transaction, Transactions and schedules, concurrent, execution of transactions, lock-based Concurrency, control. Concurrency Control: Lock management, specialized locking techniques, concurrency control without locking.

UNIT-V

Security: Introduction to database security, access control discretionary Access control, mandatory access control.

Crash Recovery: Log based recovery, Introduction to ARIES, Recovering from a System Crash, Media Recovery.

Suggested Readings:

1. Raghu Ramakrishna, Johannes, Gehrke, Database Management Systems, 3rd Edition, Mc-Graw Hill 2003
2. Ramez Elmasri, Shamkant B. Navathe, Somayajulu, Gupta, Fundamentals of Database Systems, Pearson Education, 2006.
3. Silberschataz, Korth, Sudarshan - Database System Concepts, 5th Edtn. McGraw Hill 2006.

INTERACTIVE COMPUTER GRAPHICS

CS-703

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Overview of Graphics Systems: Video display devices, Raster-Scan System, Random-Scan Systems. Random-Scan Systems Graphics monitors and work stations. Input devices: Hard copy devices. Graphics software

Output primitives: Line drawing algorithms circle generation algorithms. Ellipse Generating Algorithm. Pixel Addressing. Filled-Area Primitives. Fill Area Function, Cell Array, Character Generation.

UNIT -II

Attributes of Output Primitives: Line Attributes, Curve Attributes, Color and Gray-Scale levels. Area-Fill Attributes, Character Attributes. Bundled attributes. Inquiry functions.

Two-dimensional geometric transformations: Basic transformations.

Homogenous coordinates, composite transformations, other transformations. Affine

transformations, transformation functions, Roster methods for transformations

UNIT-III

Two-dimensional viewing: The viewing pipeline, viewing transformation, viewing functions. Line clipping, Cohen Sutherland line clipping, Liang Barsky line clipping

Polygon clipping: Sutherland-Hodgman polygon clipping, Weiler Amerton polygon clipping.

UNIT-IV

Three Dimensional Concepts: Three Dimensional Display Methods.

Three Dimensional Object Representations: Polygon surfaces, curved line and surfaces, spline representations, Bezier Curves & Surfaces, BSP line Curves and Surfaces, Constructive Solid-Geometry Methods, Octrees, BSP trees. Fractal geometry methods.

UNIT-V

Three Dimensional Geometric and, Modeling Transformations

Three Dimensional viewing: Projections

Visible Surface Detection Methods: back face detection method, depth buffer method Basic illumination methods: Phong & Gourand Shading, Texture Mapping.

Computer Animation: Design of Animation Sequences, General Computer Animation, Raster Animations, Computer-Animation Languages, Key-Frame Systems, Motion Specifications

Suggested Readings:

1. D. Hearn, P. Baker, "Computer Graphics - C Version", 2nd Edition, Pearson Education, 1997.
2. Heam Donald, Pauline Baker M: "Computer Graphics", PHI 2nd Edn. 1995.
3. Harrington S: "Computer Graphics - A Programming Approach", 2nd Edn. Mc GrawHill.
4. Shalini Govil-Pai, Principles of Computer Graphics, Springer, 2004.

OPERATING SYSTEMS

CS-704

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Introduction to Operating Systems: OS structure and strategies, Process concept, Interprocess communication, Threads, Multithreaded Programming. Process Scheduling: Scheduling Criteria, Scheduling Algorithms, Multi Processor Scheduling, Thread Scheduling

UNIT-II

Memory Management, swapping, contiguous allocation, paging. Static and dynamic partition, demand paging, page replacement Algorithms, thrashing, segmentation, segmentation with Paging.

File System Interface: File Concept, Access Methods, Directory Structure, File System Mounting, File Sharing, Protection.

File System Implementation: File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, and Free Space management, Efficiency and Performance, Recovery.

UNIT-III

Process Synchronization: Critical Section problem, Semaphores, monitors.

Deadlocks: Necessary conditions, resource allocation graph, methods for handling deadlocks, preventions, avoidance, detection and recovery.

UNIT-IV

Device Management: Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap Space Management, RAID structure. Stable storage Implementation.

I/O System: I/O hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O request to hardware operation, STREAMS.

UNIT-V

Case Studies

Linux System: Design Principles, Kernel Modules, Process Management, Scheduling Memory Management, File Systems, Input and Output, Inter-process Communication, Network Structure, Security.

Windows XP - General Architecture. The NT Kernel, The NT Executive.

Suggested Readings:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Operating System Concepts, Wiley India, 2006.
2. Andrew S. Tanenbaum, Modern Operating Systems, 2nd Edition, Pearson Education, Asia-2001.
3. Robert Love, Linux Kernel Development, Pearson Education, 2004

OPERATIONS RESEARCH

CS-705

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Linear programming problems, graphical solution, simplex method, Degeneracy, Big M-method, Two phase method,

UNIT-II

Revised simplex method, dual linear programming problem, dual simplex method.

UNIT-III

Transportation problem, assignment problem, Transshipment problem.

Traveling salesman problem, Integer programming, Branch & Bound algorithm, cutting plane algorithm.

UNIT -IV

Sequencing problems, two machine sequencing problem, N-job, Three machine problem, Project network, CPM and PERT.

UNIT-V

Decision theory, Minimax decision procedure, Game theory, pure strategies, expected pay off, solution of 2 x 2 games dominance, Solution of 2 x n and m x 2 games. Brown's algorithms.

Suggested Readings:

1. Hamdy A. Taha, Operations Research and Introduction, 8th Edition, Pearson Education, 2007.
2. Billy E. Gillette, Introduction to Operations Research, Tata McGraw Hill, 1979.

**PROGRAMMING LAB-V
(DBMS Programming)**

CS-731

Instruction	3 Periods per week
Duration of University Examination	3
Hours University Examination	50 Marks
Sessional	25 Marks

I. SQL/PL-SQL:

1. Creation of database (exercising the commands for creation)
2. Simple to complex condition query creation using SQL plus
3. Demonstration of blocks, cursors & database triggers.

II. Forms/Reports:

4. Creation of forms for the case study assigned.
5. Creation of Reports based on different queries.
6. Creating password and security features for applications.
7. Usage of file locking table locking, facilities in applications
8. Creation of Small full fledged database application spreading over to 3 sessions.

Note:

- (i) Use Case Studies such as Library Information System, Payroll System, Bank Information system Reservation system. Inventory system etc.
- (ii) The creation of Sample database for the purpose of the experiments is expected to be pre-decided by the instructor based on the case study assigned to the students.
- (iii) Preferably Oracle DBMS package should be used to carry the Lab experiments.

PROGRAMMINGLAB-VI (OPERATING SYSTEMS LAB)

CS-732

Instruction	3 Periods per week
Duration of University Examination	3
Hours University Examination	50 Marks
Sessional	25 Marks

1. Printing file flags for specified descriptor.
2. Print type of file for each command line arguments.
3. Recursively descends a directory hierarchy counting file types.
4. Program using process related system calls.
5. Programs to create threads.
6. Program using Signals.
7. Echo server-using pipes.
8. Echo server-using messages.
9. Producer & Consumer Problem using Semaphores and Shared memory.
10. Producer & Consumer problem using message passing,.
11. Readers and Writers problem using message passing..
12. Dining philosopher's problem using semaphores.
13. Program using File Locking.
14. Understanding and submitting and assignment on RC scripts.
15. Programs using Linux shell script (Note 2 Shell Programs covering the salient features of Shell)

SCHEME OF INSTRUCTION & EXAMINATION**MCA II YEAR****Faculty of Information Technology****With Effect from Academic year 2007-2008****SEMESTER- II**

S. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L/T	D/P		Univ, Exam	Sessionals
THEORY							
1	CS751	Design and Analysis of Algorithms	4	-	3	80	20
2	CS752	Computer Networks	4	-	3	80	20
3	CS753	Software Engineering	4	-	3	80	20
4	CS754	Web Programming	4	-	3	80	20
5		Elective-I (Any One)	4	-	3	80	20
	CS755	Artificial Intelligence					
	CS756	Distributed Systems					
	CS757	Information Retrieval Systems					
PRACTICALS							
1	CS781	Programming Lab-VII (Computer Networks Lab)	-	3	3	50	25
2	CS782	Programming Lab-VIII(Web Programming Lab)		3	3	50	25
	Total		20	6		500	150

DESIGN AND ANALYSIS OF ALGORITHMS

CS-751

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Introduction: What is an Algorithm?, Specification, Performance analysis, randomized algorithms, Elementary data structures, stacks, queues, trees, dictionaries, priority queues, Sets & Disjoint Set Union, Graphs.

UNIT-II

Divide and Conquer: The general method, binary search, finding maximum and minimum, merge sort, quick sort and selection, Strassen's Matrix multiplication.

Greedy Method: knapsack problem, Tree vertex splitting, optimal storage on tapes, Job sequencing with deadlines. Optimal merge pattern, Minimum spanning trees and Single source shortest paths.

UNIT-III

Dynamic Programming and traversal techniques

Multistage Graphs, All Pairs Shortest Path, Optimal Binary Search Trees, 0/1 Knapsack, Reliability Design, Traveling Salesmen Problem

Depth First Search, Breadth First Search, Biconnected Components and DFS,

UNIT-IV

Back-tracking and branch-bound

8-queen's problem, graph colouring, Hamiltonian cycles, knapsack problem. 0/1 Knapsack problem, traveling salesperson problem.

UNIT -V

NP-Hard and NP-completeness

Basic concepts, Cook's theorem, NP-Hard graph problems and scheduling problems. NP-Hard code generation problems, decision problem. Node covering problem.

Suggested Readings:

1. Horowitz, Sahani, Computer Algorithms, Galgotia Publications, 2004.
2. Aho, Hopcroft, Ullman, The Design and Analysis of Computer Algorithms, Addison Wesley, 1974.

COMPUTER NETWORKS

CS-752

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Review of ISO Ref Model, Network Architecture (OSI and TCP/IP)

Network Layer: Design Issues, Services, Internal Organization Comparison of Virtual Circuits and Data Gram Subnets.

Routing Algorithms: The Optimality Principle, Shortest Path Routing Flooding, Flow-based, Distance vector, Link State, Hierarchical, Broadcast and Multicast Routings.

Congestion Control Algorithms: General Principles, Traffic Shaping Congestion Control in Virtual Circuit Subnets, Choke Packets, Load Shedding Jitter Control and Congestion Control for Multitasking.

UNIT-II

Internetworking: How Networks Differ, Concatenated Virtual Circuits Connectionless Internetworking, Tunneling, Internetwork ROUTING Fragmentation and Fire Walling. The Network Layer the Internet: The IP Protocol, IP Addresses, Subnets Internet Control Protocols, Gateway Routing Protocols, and Multitasking. Network layer in ATM Networks.

UNIT-III

Transport Layer: Quality of Service, Primitives. Addressing, Establishing a Connection, Releasing a Connection, flow Control, Buffering, Multiplexing and Cash Recovery. Internet Transport Protocols (TCP and UDP): The TCP Service Model. The TCP Protocol. The TCP Segment Header, TCP Connection Management. Transmission Policy, Congestion Control. Timer Management, UDP, The ATM AAL, Layer Protocols.

UNIT-IV

Socket Programming: Socket address, elementary socket system calls, advanced socket system calls, reserved ports, socket option, asynchronous I/O input/output Multiplexing out-of-band data, sockets and signals, internet super server,

UNIT-V

Application Layer: Network Security, Cryptography, Principle, Secret-Key, Public-Key Algorithms, Authentication, Protocols, Digital Signature Social Issues.

Domain name system: DNS namespace. Resource Records, Name Services

SNMP: SNMP Model.

Electronic Mail: Architecture and Services, the User Agent, Message Formats, Message Transfer. E-mail Piracy, WWW.

Suggested Readings:

1. Andrew S. Tanenbaum, Computer Networks, 4th Edition, Pearson Education, 2003.
2. W. Richard Stevens, Stephen A Rago, Advanced Programming in the Unix Environment, 2nd Edition, Pearson Education, 2005.

SOFTWARE ENGINEERING

CS753

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Introduction to Software Engineering: Software Engineering Challenges, Software Engineering approach

Software Process: Software Process, Characteristics, software development process models - Waterfall, Iterative, Prototype, Incremental, Spiral, win-win Spiral, Comparison. Project Management Process.

UNIT- II

Software Requirement Analysis and specification: Software Requirements, Need for SRS, Problem analysis, Requirements specification, IEEE format of SRS, Requirements Engineering, Requirements Validation, Object-oriented Analysis

Case Studies - Course Scheduling, Personal Investment Management System

Software Architecture: Role of Software Architecture, Architecture views, Component and Connector view. Architectural styles of C&C view. Evaluating Architectures.

UNIT-III

Function Oriented Design: Design Principles, Module-level concepts. Design notations and specifications, structured design methodology. Object-oriented design

Detailed Design: Detailed design and PDL, Verification, Metrics

User Interface Design: Golden rules, User Interface Design, Interface Design Activities, Implementation tools, Risk Engineering – Risk Analysis and Management,

UNIT-IV

Testing Techniques & Strategies: Fundamentals, Test case design, white box, black box, basis path, control structure testing, Strategic approach to software testing, Unit testing, Integration

testing, Validation testing & System Testing.

Software Maintenance: Definition, Maintenance activities, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering.

UNIT-V

Effort & Schedule Estimation: Software Project Estimation, Decomposition techniques, Empirical Estimation Models (COCOMO, Function Point Analysis, Delphi Approach), The Make/Buy decision. Automated Estimation tools.

Problems

Software Configuration Management: Software Configuration Management, SCM Process. Version control, Change Control, Configuration Audit, Status reporting, SCM standards.

Case Tools: Overview.

Suggested Readings:

1. Pankaj Jalote, "An Integrated Approach to Software Engineering", 3rd edition, Narosa Publishing House.
2. Roger S, Pressman, Software Engineering: A Practitioner's Approach, 6th Edition, Tata McGrawHill.
3. James F. Peters, Witold Pedrycz, Software Engineering - An Engineering Approach, John Wiley Inc., 2000.

WEB PROGRAMMING

CS-754

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

HTML: Markup languages, common tags, header, test styling, linking images Formatting text, Unordered lists, nested and ordered list. Tabs and formatting, Basic forms, Complex forms linking, Meta Tags.

Dynamic HTML: Cascading style sheets, in line styles, style element, External Style sheet, text flow and Box model, user style sheets.

UNIT -II

Object model and collections: Object referencing, collections all, children frames, navigator object.

Event model: ONCLICK, ONLOAD, Error Handling, ON ERRORS ONMUOUSEMOVE,

ONMUSEOVER, ONMOUSEOUT, ONFOCUS, ONBLUR, ONSUBMIT.

Dynamic HTML: Filters and transitions. Data binding with Tabular data control binding to IMG, TABLE, Structured graphics. Active controls.

UNIT -III

Introduction to scripting, Java Script, Data types. Arithmetic's Equality relational, assignment increment, decrement operators, Java Script Control Structures - if, if-else, while.

Java Script Control Structures: For, Switch, Do/while, break. Programming modules, recursion, recursion vs iteration global functions arrays, using arrays. Reference and reference parameters, passing arrays to functions, multiple-subscripted arrays, objects-math, string. Boolean and number.

UNIT-IV

Client side scripting with VB script, operations, Data types and control structures, Functions, Arrays, String manipulations, classes and objects.

Web Servers: Personal Web server, internet information server. Apache Web server, Installation of a Web server

UNIT-V

Active Server Pages, Client side Scripting vs Server side Scripting, Server side Active X component, ADO, file system objects, Session tracking, CGI and PERL5, String Processing and Regular Expressions, Server side includes, Cookies and PERL XML Document Type Definitions, XML Parsers, Using XML with HTML.

Suggested Readings:

1. Deitel, Deitel & NIETO, Internet & World Wide Web - How to program, Pearson Education, 3rd Edition, 2004.
2. Steven Hoizner, HTML black Book - Comprehensive Problem Solver, Dream Tech Press, 2000.

ARTIFICIAL INTELLIGENCE (Elective-I)

CS 755

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Definition, Level of model, Criteria for success, Problem as a State space search, Problem

Characteristics, Production system characteristics

UNIT-II

Forward Vs Backward reasoning, problem trees Vs graphs, knowledge representation and the Frame problem, Matching. Heuristic function, Weak methods, The Minimax search procedure. Adding alpha-beta cutoffs. Additional refinements

UNIT-III

Representing simple facts in logic, Augmenting the representation with Computable function and Predicates. Resolution. Natural deduction. Non-monotonic reasoning. Statistical & Probabilistic reasoning. Declarative representation. Procedural representation.

UNIT-IV

PROLOG: Introduction, Facts, Questions, Variables, Conjunctions, Rules, Syntax Character operators, Equality, Matching, Arithmetic, Satisfying goals. Data structures. Trees, Lists and Operations

UNIT-V

Backtracking, Cut, Input & Output operations, Built-in Predicates, Comparative study of List and PROLOG features.

Suggested Readings:

1. Rich E. Artificial Intelligence. TMH. 1983
2. Clocksin WF, Mellish CS. Programming in Prolog, 2nd, Narosa P ublications, 198

DISTRIBUTED SYSTEMS (Elective-I)

CS756

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Introduction to Distributed Systems: Definition, Goals, Hardware and software Concepts and client/server model.

Processes: Threads, Clients, Servers, Code Migration, Software agents.

UNIT-II

Naming; Entities: DNS, X.500, Locating Mobile entities, removing unreferenced entities

Synchronization: clock, logical clock, Global state, election algorithms. Mutual exclusion,

distributed Transaction.

UNIT-III

Consistency and Replication: Data-Centric, Client-Centric Consistency Models, Distribution and Consistency protocols.

Fault Tolerance: Introduction, Process resilience, Reliable client-server and Group communication. Distributed Commit and Recovery.

UNIT-IV

Distributed Object based Systems: CORBA, D-COM & GLOBE. Distributed File System, Case studies: SUN NFS, CODA.

UNIT-V

Distributed shared memory: Implementation algorithms, memory coherence, and Design issues.

Distributed Scheduling: Issues in Load Distributing, Components of Load Distributing Algorithms, Load Distributing Algorithms.

Suggested Readings:

1. Andrew S. Tanenbaum and Van Steen, Distributed Systems, Pearson Education, 2002.
2. Singhal M, Shivaratri N.G: Advanced concepts in Operating Systems. McGraw-Hill, 1994.

INFORMATION RETRIEVAL SYSTEMS (Elective-I)

CS-757

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT -I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital Libraries and Data Warehouses Information Retrieval System Capabilities: Search, Browse, Miscellaneous.

UNIT -II

Cataloging and Indexing: Objectives, Indexing process. Automatic Indexing, Information Extraction.

Data structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, signature file structure, Hypertext data structure.

UNIT - III

Automatic Indexing: Classes of automatic indexing. Statistical indexing Natural Language, Concept indexing, Hypertext linkages

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters

UNIT -IV

User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback. Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext Information

Visualization: Introduction Cognition and perception, Information visualization technologies.

UNIT-V

Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information system Evaluation: Introduction, Measures used in system evaluation, Measurement example - TREC results.

Suggested Readings:

1. Kowalski, Gerlad; Information Retrieval Systems: Theory and Implementation, Kluwer Academic Press, 1997.
2. Frakes, W.B. Rcaedo Baeza-Yates; Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.

PROGRAMMING LAB-VII (COMPUTER NETWORKS LAB)

CS-781

Instruction	3 Periods per week
Duration of University Examination	3
Hours University Examination	50 Marks
Sessional	25 Marks

1. Using and understanding and assignment submission on the following Commands. Ifconfig, net stat, ping, arp, telnet, ftp, finger.
2. Echo Server, Time of day service, connection oriented/connectionless. Iterative/concurrent server.
3. Ping service implementation.
4. Remote program execution.
5. Remote file access using RFC.
6. A program to pass file description.
7. A program to provide a reliable message service using library messages.

8. Rlogin Client, Rlogin Server
9. Implementation of Remote Program execution using Socket system calls.
10. Programs to demonstrate the usage of Advanced Socket System Calls like Getsockopt (), Setsockopt (), Select (), Readv (), getpeername (), Getsockname ().
11. Program to demonstrate the Non-Blocking (Asynchronous) Input-Output.
12. Program to demonstrate the implementation of Pre forked Server Design.

Suggested Readings:

1. Douglas E.Comer, "Hands-on Networking with Internet Technologies", Pearson Education, 2002.

PROGRAMMING LAB -VIII (WEB PROGRAMMING LAB)

CS-782

Instruction	3 Periods per week
Duration of University Examination	3
Hours University Examination	50 Marks
Sessional	25 Marks

1. Creating HTML pages to test different Tags.
 - a). Headers
 - b). Linking Images.
 - c). Images as anchor
 - d). Text Formatting.
2.
 - a). HTML Table Formatting.
 - b). Ordered and Unordered lists.
3. Creating Frames.
4. Examination result in Java Script.
5. Creation of Quiz program.
6. Usage Data and the methods of Date and Time objects.
7. Floating alerts, aligning text and setting box dimension using CSS.
8. Demonstrating object hierarchy using collection children.
9. Using HTML Events.
10. Using Transition & Filters like Flip filter, Chroma filter, Shadow filter etc.,
11. VB script classes and regular expression.
12. Installing Web Server (PWS or IIS),
13. Guest book Active Server pages.
14. Creation of Small full fledged database application using ADO spreading over to 3 sessions

SCHEME OF INSTRUCTION & EXAMINATION

MCA III YEAR

Faculty of Information Technology

With Effect from Academic year 2008-2009

SEMESTER - I

S. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L/T	D/P		Univ, Exam	Sessionals
THEORY							
1	CS801	Software Reuse Techniques	4	-	3	80	20
2	CS802	Middleware Technologies	4	-	3	80	20
3	CS803	Object-Oriented System Development	4	-	3	80	20
		Electives-II (Any One)					
4	CS804	Electronic Commerce	3	-	3	80	20
5	CS805	Data Warehousing & Mining	3	-	3	80	20
6	CS806	Software Quality and Testing	3	-	3	80	20
7	CS807	Neural Networks	3	-	3	80	20
8	CS808	XML and We Services	3	-	3	80	20
		Electives-III (Any One)					
9	CS809	Mobile Computing	3	-	3	80	20
10	CS810	Network Security	3	-	3	80	20
11	CS811	System Administration	3	-	3	80	20
12	CS812	Rich Internet Applications	3	-	3	80	20
PRACTICALS							
1	CS831	Programming Lab-IX (OOSD Lab)	-	3	3	50	25
2	CS832	Programming Lab-X (MWT Lab)	-	3	3	50	25
2	CS833	Seminar	-	3	-	-	25
	Total		20	9		500	175

SOFTWARE REUSE TECHNIQUES

CS801

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Software Reuse Factors, Reuse driven Software Engineering Business, Object oriented Software Engineering, Applications and Components Subsystems, Use Case Components. Object Components.

UNIT-II

Design Patterns - Introduction

Creational Patterns – Factory, Factory Method, Abstract Factory, Singleton, Builder, Prototype.

Structural Patterns – Adapter, Bridge, Composite, Decorator, Facade, Flyweight, Proxy

UNIT-III

Behavioral Patterns - Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template, Visitor, Other Design Patterns-Whole-Part, Master-Slave, View Handler, Forwarder-Receiver, Client-Dispatcher-Server, Publisher-Subscriber.

UNIT-IV

Architectural Patterns – Layers, Pipes and Filters, Black Board, Broker, Model-View Controller, Presentation - Abstraction – Control, Micro Kernel, Reflection.

UNIT-V

Case Studies

Design Patterns in Java: Interface Patterns, Responsibility Patterns, Construction Patterns, Operation Patterns, Extension Patterns.

J2EE Patterns: Overview, Presentation Tier Patterns, Business Tier Patterns, Integration Tier Patterns.

Suggested Readings:

1. Ivar Jacobson, Martin Griss, Partick Johnson - Software Reuse: Architecture, Process and Organization for Business Success, Pearson Education, 2007.
2. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides- Design Patterns Elements in Resuable Object Oriented Software - Pearson Education, 2007.
3. Frank Buschmann etc. – Pattern Oriented Software Architecture – Volume 1, Wiley 2001.
4. Steven John Metsker, William C. Wake-Design Patterns in Java - Pearon Education, 2007.
5. Deepak Alur, John Crupi, Dan Malks – Core J2EE Patterns, Pearson Education, 2006.

MIDDLEWARE TECHNOLOGIES

CS- 802

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT I. CLIENT/SERVER CONCEPTS

Client Server – File Server, Database Server, Group Server, Object Server, Web Server
Middleware – General Middleware – Service specific Middleware.

Client/Server Building Blocks – RPC – Messaging – Peer-to-Peer Web Services – SOA, SOAP, WSDL, REST Services

UNIT II. EJB ARCHITECTURE

EJB – EJB Architecture – Overview of EJB Software Architecture – View of EJB – Conversation – Building and Deploying EJBs – Rules in EJB.

UNIT III. EJB APPLICATIONS

EJB Session Beans – EJB Entity Beans – EJB Clients – EJB Deployment – Building an Application with EJB.

UNIT IV. CORBA

CORBA – Distributed Systems – Purpose – Exploring CORBA alternatives – Architecture Overview – CORBA and Networking Model – CORBA Object Model – IDL – ORB – Building an Application with CORBA.

UNIT V. COM

COM – Data Types – Interfaces – Proxy and Stub – Marshalling – Implementing Server/Client – Interface Pointers – Object Creation, Invocation, Destruction – Comparison COM and CORBA – Introduction to .NET – Overview of .NET Architecture – Marshalling – Remoting

Suggested Books:

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client/Server Survival Guide", Galgotia Publications Pvt. Ltd., 2002. (Unit 1)
2. Tom Valesky, "Enterprise Java Beans", Pearson Education, 2002.(Unit 2 & 3)
3. Jason Pritchard, "COM and CORBA side by side", Addison Wesley, 2000 (Unit 4 & 5)
4. Jesse Liberty, "Programming C#", 2nd Edition, O'Reilly Press, 2002. (Unit 5)
5. Arno Puder, Kay Romer and Frank Pilhofer, Distributed Systems Architecture, Morgan Kaufman 2006.

REFERNCES

1. Mowbray, "Inside CORBA", Pearson Education, 2002.
2. Jeremy Rosenberger, "Teach yourself CORBA in 14 days", Tec media, 2000

OBJECT ORIENTED SYSTEM DEVELOPMENT

CS-803

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT – I**UML Introduction:** Why we Model, Introducing the UML, Hello World**Basic Structural Modeling:** Classes, Relationships, Common mechanisms, Diagrams, Class diagrams,**Advanced Structural Modeling:** Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages, Instances, Object Diagram, Components**UNIT –II****Basic Behavioral Modeling:** Interactions, Use Cases, Use Case Diagrams, Interaction Diagrams, Activity Diagrams**Advanced Behavioral Modeling:** Events and Signals, State Machines, Processes and Threads, Time and Space, State Chart Diagrams**UNIT –III****Architectural Modeling:** Artifacts, Deployment, Collaborations, Patterns and Frame Works, Artifact Diagrams, Deployment Diagrams, Systems and Models.**UNIT – IV****Unified Software Development Process:** The Unified Process, The Four Ps, A Use-Case Driven Process, An Architecture-Centric Process, An Iterative and Incremental Process.**UNIT- V****Core workflows:** Requirements Capture, Capturing Requirements as Use Cases. Analysis, Design, Implementation, Test.**Suggested Readings:**

1. Grady Booch, James Rumbaugh, Ivor Jacobson, "The Unified Modeling language – User guide", Pearson Education, India 1999.

- Ivor Jacobson, Grady Booch, James Rumbaugh, "The Unified Software Development Process", Pearson Education, India, 2008.

ELECTRONIC COMMERCE

CS- 804

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT – I

Electronic Commerce – Frame Work, Anatomy of E-Commerce Applications, E-Commerce Consumer Applications, E-Commerce Organization Applications
Consumer Oriented Electronic Commerce – Mercantile Process Models.

UNIT – II

Electronic Payment Systems – Digital Token – Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.

UNIT – III

Inter Organizational Commerce – EDI, EDI Implementation, Value Added Networks.
Intra Organizational Commerce – Work Flow, Automation, Customization and Internal Commerce, Supply Chain Management

UNIT – IV

Corporate Digital Library – Document Library, Digital Document Types, Corporate Data Warehouse, Advertising and Marketing – Information based Marketing, Advertising on Internet, On-Line Marketing Process, Market Research.

UNIT –V

Consumer Search and Resource Discovery – Information Search and Retrieval, Commerce Catalogues, Information Filtering

Multimedia – Key Multimedia Concepts, Digital Video and Electronic Commerce, Desktop Video Processing, Desktop Video Conferencing

Suggested Readings:

- Ravi Kalakota & A. B. Whinston - "Frontiers of Electronic Commerce", Pearson Education, India, 1999.
- Daniel Minoli, Emma Minoli: "Web Commerce Technology Handbook", Tata McGraw Hill, 2007.

DATAWARE HOUSING AND DATA MINING

CS- 805

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT – I

Elements of Data Warehouse

Dimensional Modeling – Introduction, Data Warehouse Bus Architecture, Dimensional Modeling Techniques.

Extended Dimensional Table Design, Extended Fact Table Design, Advance ROLAP querying and Reporting, Building Dimensional Models.

UNIT – II

Data Warehouse Architecture – Framework and Approach. Backroom Technical Architecture. Architecture for Front Room Infrastructure and Metadata

UNIT – III

Aggregates, Aggregate Navigational System and Algorithm.

Physical Design – Physical Data Model, Initial Index Plan, Design and Build Database Instance, Physical Storage Structure, Usage Monitoring, Data Staging. Building End User Application.

UNIT – IV

Data Mining – Introduction, Definitions, KDD, Data Mining Techniques, Problems, Issues, Challenges, Applications.

Association Rules - Introduction, Methods – Apriori, Partition, Pincer – Search, Dynamic Itemset Counting, FP – Tree Growth, Incremental, Border Algorithms.

Clustering Techniques – Introduction, Algorithms.

UNIT –V

Decision Trees – Introduction, Best Split, Splitting Indices and Criteria, Decision Tree Construction Algorithms, Pruning Techniques.

Neural Networks - Introduction, Learning, Unsupervised Learning.

Temporal Mining – Introduction, Temporal, Association Rules, Sequence Mining Algorithms, Episode Discovery, Event Prediction, Time-Series Analysis.

Spatial Mining – Tasks, Clustering, Trends.

Suggested Readings:

1. Ralph Kimball, Laura Reeve, Margy Ross, Warren Thornthwaite - The Data Warehouse – Life Cycle Tool kit, Wiley, 1998.
2. Arun K Pujari – Data Mining Techniques, University Press 2001.
3. Alex Berson, Stephen J. Smith: "Data Warehousing, Data Mining & OLAP, Tata McGraw Hill, 2004.
4. Pang-Ning Tan, M. Steinback, Vipin Kumar: "Introduction to Data Mining", Pearson Education, 2007.

SOFTWARE QUALITY & TESTING

CS-806

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT – I

Software Quality, Software quality Metrics, Applying Seven Basic Tools in Software Management, Defect Removal Effectiveness, The Rayleigh Model, Exponential Distribution and Reliability Growth Models.

UNIT – II

Quality Management Tools, Complexity Metrics and Models, Metrics for Object Oriented Projects, Availability Metrics, Measuring and Analyzing Customers Satisfaction.

UNIT – III

Conducting Inprocess Quality Assessments, Conducting Software Projects Assessments, Software Process Improvement, Using Function Point Metrics to Measure Software Process Improvement.

UNIT – IV

White Box Testing, Black Box Testing, Integration Testing, System and Acceptance Testing, Performance Testing, Regression Testing, Internationalization Testing, Ad-hoc Testing, Testing of Object-Oriented Systems, Usability and Accessibility Testing.

UNIT – V

Test Management and Automation: Test Planning, Management, Execution and Reporting, Software Test Automation, Test Metrics and Measurements,

Suggested Readings:

1. Stephen H. Khan, "Metrics and Models in Software Quality Engineering", Pearson Education, India, 1995.
2. Srinivasan Desikan, Gopaldaswamy Ramesh, "Software Testing Principles and Practices", Pearson Education, India, 2007.

NEURAL NETWORKS

CS 807

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT –I

Neural Networks: History of Neural Networks Development. Introduction to Expert Systems. Expert System vs Neural Networks. Biological Neurons. Artificial Neurons – Activation Functions. Neural Networks Concepts and Architecture. Knowledge Representation in Neural Networks. Artificial Intelligence and Neural Networks.

UNIT–II

Learning Methods: Categories of Learning – Supervised/Unsupervised and Reinforcement Learning Memory based Learning. Hebbian Learning. Competitive Learning. Boltzman Learning. Statistical Learning.

UNIT –III

Neural Networks Models: Single Layer Perception Least Mean Square Algorithm Perception Convergence Theorem.

UNIT – IV

Multi Layers Perception: Introduction, Back Propagation Algorithm. Stopping Criteria Complexity of Learning Generalization.

UNIT –V

Hopfield Model - The Hopfield Learning Algorithm and its Limitations.
Self Organizing Network: Introduction, The Kohonen Algorithm, Neural Networks Applications.

Suggested Readings:

1. Simon Hayking: Neural Networks - A Comprehensive Foundation, Pearson Education, India, Second Edition, 2001.
2. Limin Fu: Neural Networks in Computer Intelligence, Mc-Graw Hill Publications.

XML AND WEB SERVICES

CS- 808

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT I - INTRODUCTION

Role of XML – XML and Anti-Web XML Language Basics – SOAP – Web Services – Revaluation of XML – Service Oriented Architecture (SOA)

UNIT II – XML TECHNOLOGY

XML – Namespaces – Structuring with Schemas and DID – Presentation Techniques – Transformation – XML Infrastructure

UNIT III - SOAP

Overview of SOAP – HTTP – XML – RPC – SOAP: Protocol – Message Structure – Intermediaries – Actors – Design Patterns and Faults – SOAP with Attachments

UNIT IV – WEB SERVICES

Overview – Architecture – Key Technologies – UDDI – WSDL – ebXML – SOAP and Web Services in E-Com – Overview of .Net and J2EE

UNIT V – XML SECURITY

Security Overview – Canonicalization – XML Security Framework – XML Encryption – XML Digital Signature – XKMS Structure – Guidelines for Signing XML Documents – XML in Practice

Suggested Readings:

1. Frank. P. Coyle, XML, Web Services and the Data Revaluation, Pearson Education, 2002

References:

1. Ramesh Nagappan, Robert Skoczylas and Rima Patel Sriganesh, "Developing Java Web Services", Wiley Publishing Inc., 2004
2. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2005
3. McGovern, et al., "Java Web Services Architecture", Morgan Kaufmann Publishers, 2005

MOBILE COMPUTING

CS- 809

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT-I

Introduction and Applications of Mobile Computing, Wireless Transmission, Frequencies, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Spread Spectrum, Cellular Systems. Medium Access Control, SDMA, FDMA, TDMA, CDMA, Comparisons.

UNIT –II

Telecommunication System, GSM, DECT, TETRA, UMTS & IMT-2000
Satellite Systems: Applications, Basics, Routing, Localization, Handover
Broadcast Systems: Cyclic Representation of Data, Digital Audio Broadcasting. Digital video broadcasting, Convergence of Broadcasting and Mobile Communications

UNIT –III

Wireless LAN: Infrared vs. Radio Transmission, Infrastructure and Ad-hoc Networks, IEEE 802.11, HIPERLAN, Bluetooth

UNIT –IV

Mobile IP, Dynamic Host Configuration Protocol, Mobile adhoc Networks, Mobile Transport Layer, Traditional TCP, Classical TCP Improvements, TCP over 2.5/3G, Wireless Networks, Performance Enhancing Proxies

UNIT –V

Operating Systems for Mobile Devices: Features of Windows CE, Palm OS, Symbian OS, Java Card
Support for Mobility: File System's World Wide Web, Wireless Application Protocol.

Suggested Readings:

1. Jochen, M Schiller, Mobile Communications, Pearson Education, India, 2003.
2. Hansman, Merk, Nicklous, Slober, Principles of Mobile Computing, Second Edition, Springer International Edition, 2003.
3. Dharma P. Agarwal. Qing and Zeng - "Introduction to Wireless and Mobile Systems", Second Edition, Thomson India – 2007
4. Frank Adelstein, Sandeep K. S. Gupta "Fundamentals of Mobile and Pervasive Computing", Tata McGraw Hill, 2005.
5. Ivan Stojmenovic "Handbook of Wireless and Mobile Computing", Wiley India, 2006.

NETWORK SECURITY

CS810

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT –I

Conventional Encryption, Security Attacks, Security, Model for Network Security, Conventional Encryption Model, Encryption Techniques, DES Triple DES Key Distribution, and Random Number Generation.

UNIT –II

Public – Key Cryptology, Principles of Public – Key Cryptosystems, RSA Algorithm, Key Management, Distribution of Public Keys, Public Key Distribution of Secret Keys.

UNIT –III

Authentication and Digital Systems, Authenticate Requirements- Functions Cryptographic Checksum, Hash FUNCTION Digital Signatures Authentication Protocols, Kerberos, x-509 Directory, Authentication Services Diffie-Hellman Key Exchange, Digital Signature Standards.

UNIT – IV

Cryptographic Algorithms, The MD 5 Message Digest Algorithm, Secure Hash Algorithm, International Data Encryption Algorithm.

UNIT – V

LUC Public Key Encryption – Electronic Mail and Management Security – Pretty Good Privacy (PGP), Privacy Enchanted Mail.

Suggested Readings:

1. William Stallings, "Cryptography & Network Security", Pearson Education, 2007.
2. Bruce Schneier, "Applied Cryptography", John Wiley and Sons, 2002.
3. Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw Hill, 2007.

SYSTEM ADMINISTRATION

CS 811

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT –I

Functions of System Administrator, UNIX: Files, Processes Devices, File System, Essential Administrative Tools: Grep, awk, Files and Directory Commands, Starting and Shutdown Process.

UNIT –II

User Accounts, Security, Managing System Resources: System Performance, Managing CPU Usage, Memory, disk I/O Automating Tasks with Scripts.

UNIT –III

File System and Disks: Mounting, Adding Disks, CD-Rom Devices, and Backup and Restore Terminals Modems and Printers.

UNIT–IV

TCP/IP Network Management: TCP/IP Networking, Adding a new Host, NFS/ NIS, Monitoring the Network, E-Mail, Configuring and Building Kernel for Linux.

UNIT –V

Windows NT: Startup, Shutdown, Server Configuration, User Accounts, Managing Processes, Disks and File System Security.

Note: First Four Units are related to UNIX System, Fifth Unit is related to Windows NT.

Suggested Readings:

1. Aeloen Frisch, "Essential System Administration", O'Reilly, 1995, Second Edition.
2. Aeleon Frisch, "Essentail Windows Administration", O'Reilly, 1998, First Edition.
3. Nemeth, "Unix System Administration", Pearson Education.

RICH INTERNET APPLICATIONS

CS- 812

Instruction	4 Periods per week
Duration of University Examination	3
Hours University Examination	80 Marks
Sessional	20 Marks

UNIT I

What is Web 2.0? Folksonomies and Web 2.0, Software as a Service. Multiple Delivery Channels (Voice – VOXML and ANT (HTML), Social Networking

UNIT II

Client-Side Programming – Overview of Javascript, Objects in Javascript, Regular Expressions, Overview of XML, DTD and XML Schema, DOM and SAX Parsers, CSS, XSLT

UNIT III

Web Services – SOA, SOAP, WSDL, Rest Service.
JSON Format – Ajax Introduction, XML HTTP Object Comparison with IFrames

UNIT IV

Building Rich Internet Applications – Flash Player, Flex Framework, MXML Introduction, ActionScript Introduction, Working with Actionscript, Flex Data Binding, Common UI Components using DataGrids, Tree Controls, Popup Controls etc.

UNIT V

Mash up using Flex and Ajax. Web Services in Flex. Semantic Web (Web 3.0), Resource Description Framework, Use and Examples, Ontologies, Web Ontology Language (OWL)

Reference Books:

1. Ivan Bayrossf, "Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI", BPB Publications, 2007
2. Colin Mook: "Essential Actionsript 3.0", O'Reilly Publications, 2007
3. Steven Holzner: "Ajax Bible" Wiley India Education, 2007
4. Justin Gehtland et al: "A Web 2.0 Primer Pragmatic Ajax", SPD Publications, 2006

PROGRAMMING LAB IX OOSD LAB

CS- 831

Instruction	3 Periods per week
Duration of University Examination	3
Hours University Examination	50 Marks
Sessional	25 Marks

Using a particular application, use an object-oriented case tool for:

1. Requirements Management
2. Data Modeling
3. Application and Web Modeling
4. Configuration Management
5. Unit Testing
6. Content Management
7. Functional Testing
8. Reliability Testing
9. Performance Testing
10. Defect and Change Tracking
11. System Documentation

PROGRAMMING LAB X MWT LAB

CS- 832

Instruction	3 Periods per week
Duration of University Examination	3
Hours University Examination	50 Marks
Sessional	25 Marks

1. Create a distributed name server (like DNS) RMI.
2. Create a Java Bean to draw various graphical shapes and display it using or without using BDK
3. Develop an Enterprise Java Bean for Student Information System
4. Develop an Enterprise Java Bean for Library Operations
5. Create an active-x control for time table
6. Develop a component for converting the currency values using COM/.Net
7. Develop a component for browsing CD catalogue using COM/.Net
8. Develop a component for retrieving information from message box using DCOM/.Net
9. Develop a middleware component for retrieving stock exchange information using CORBA
10. Develop a component for retrieving bank balance using CORBA

SCHEME OF INSTRUCTION & EXAMINATION**MCA III YEAR****Faculty of Information Technology****With Effect from Academic year 2007-2008****SEMESTER- I**

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessionals
1	CS851	Project Seminar		3			25
2	CS852	Project		6		Grade	50

PROJECT SEMINAR

CS-851

Instruction 5 Periods per week
Sessional 25 Marks

1. Oral Presentation is an important aspect of Engineering Education. The Objective of the seminar is to prepare the student for systematic independent study of state of the art topics in broad area of his/her specialization.
2. Seminar topics can be chosen by the students with the advice from the faculty members
3. Students are to be exposed to following aspects of seminar presentations

Literature Survey
Organization of Material
Preparation of OHP Slides/ PC Presentation
Technical Writing

Each student is required to

4. Submit one page of synopsis of the seminar talk two days before for display on notice board.
5. Give 20 minutes presentation through OHP, PC and slide projector, followed by 10 minutes discussion.
6. Submit a report on the seminar topic with a list of references and slides used within a week.

Seminars are to be scheduled during the 5th week of the semester and any change in schedule should be discouraged.

The Sessional marks will be awarded to the students by atleast two faculty members on the basis of an oral and a written presentation as well as their involvement in the discussion.

PROJECT

CS-852

Instruction	6 Periods per week
Duration of University Examination	Viva Voce
University Examination	Grade
Sessional	25 Marks

Sixth semester of MCA course is exclusively meant for project work. Project has to be carried out by each student individually in a period of 15 weeks of duration. Students should submit a synopsis at the end of 4th week in consultation with the project guide. The synopsis should consist of definition of the problem, scope of the problem, and plan of action. After completion of 8 weeks, students are required to present an internal assessment as a seminar on the topic conversing the aspects of analysis, design and implementation of the project work. A committee to faculty that includes guide will award the Sessional.

At the end of the seminar, the students are required to present themselves for a university viva-voce examination in which each student will be awarded with a grade.

- Excellent/Very Good/Good/Satisfactory/Unsatisfactory

Note: Three periods of contact load will be assigned to each project guide.