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EIILM University

Directorate OF DISTANCE LEARNING

**SYLLABUS BOOKLET
Semester-I TO VI**

**MASTER OF COMPUTER
ADMINISTRATION
PROGRAM**

JAN 2010 ONWARDS

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – I**

**UNDERSTANDING COMPUTERS & PROGRAMMING
FUNDAMENTALS**

Sub. Code: MCA - 101

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION TO COMPUTERS

Evolution of computer, Data, Instruction and Information, Characteristics of computers, Various fields of application of computers, Advantages and Limitations of computer. Block diagram of compute, Classification of computers - Micro, Mini, mainframe and Super, Types of software (System and Application),

UNIT 2: DATA REPRESENTATION:

Different Number System (Decimal, Binary, Octal and hexadecimal) and their inter conversion (Fixed Point Only), Binary Arithmetic (Addition, Subtraction, Multiplication and Division)

UNIT 3: INSIDE COMPUTERS

Functional units of computer, I/O devices, primary and secondary memories; BIOS, ROM BIOS.

BLOCK II

UNIT 4: INTRODUCTION TO PROGRAMMING FUNDAMENTALS

Assembler, Compiler, Macros, Tokens, Parsers

UNIT 5: PROBLEM SOLVING

Problem solving techniques (Trial & Error, Brain storming, Divide & Conquer), Steps in problem solving (Define Problem, Analyze Problem, Explore Solution), Algorithms and Flowcharts (Definitions, Symbols), Characteristics of an algorithm, Conditionals in pseudo-code, Loops in pseudo code, Time complexity: Big-Oh notation, efficiency, Simple Examples: Algorithms and flowcharts, Step-wise refinement, Algorithms for searching, sorting (exchange and insertion), merging of ordered lists.

UNIT 6: REPRESENTATION

Representation of integers, characters, real Data types: constants and variables; Arithmetic Expressions, Assignment statement, Logical expression, Sequencing, Alteration and iteration; ring processing;

BLOCK III

UNIT 7: FUNCTION

What is a Function, Passing value between Functions, Scope Rule of Function, Calling Convention, Sub Programs.

UNIT 8: POINTERS

Introduction to Pointers, Pointers Notations; Recursion, Recursion & Stack

UNIT 9: STRUCTURED ROGRAMMING

Structured programming concepts; Top down Design, Development of efficient program; Program correctness; Debugging and testing of Programs.

TEXT BOOK:

- 1) Alfred V. Aho, Ravi Sethi & Jeffrey. D. Ullman, Compilers Principles, Techniques & Tools.

REFERENCES:

- 1) Aho. A.V & Ullman J.D Principles of Compiler Design .
- 2) S.S. Muchnick Harcourt Asra (Morgan Kaufman),Advanced Compiler Design implementation, 1997
- 3) Modern Compiler Implementation in C , Cambridge Uty. Press 1997.
- 4) Alan Holub, Compiler Design in C, PHI
- 5) Kenneth C. Loudon, Compiler Construction, Principle and Practice, Thomson Books
- 6) Leland L.Beck, "System Software An Introuction to System Programming", Addison Wesley
- 7) D.M.Dhamdhere, "System Programming and Operating Systems", 2ond Ed., Tata Mcgrawhill

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – I**

OFFICE AUTOMATION AND COMPUTER INTERNALS

Sub. Code: MCA - 102

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: MS – WORD

Office-MS Word. Its features & applications

UNIT 2: MS- EXCEL

MS Office –MS Excel. Its Features & Applications.

UNIT 3: MS - POWERPOINT

MS Office –MS PowerPoint Its features & applications.

BLOCK II

UNIT 4: INPUT AND OUTPUT DEVICES:

Keyboard, Mouse, Joystick, Digitizer, Scanner, MICR, OCR, OMR, Light Pen, Touch Screen, Bar Code Reader, Voice Input Device, Monitor and its type (VGA, SVGA and XGA), Printer and its type (Impact and Non-Impact with example), Plotter, Primary Memory (ROM and its type – PROM, EPROM, RAM) Magnetic Disks – Floppy disks, Hard disks, Optical disks – CD ROM and Cache Memory.

UNIT 5: OPERATING SYSTEM CONCEPT:

Introduction to operating system; Function of OS, Types of operating systems, Booting Procedure, Start-up sequence, Details of basic system configuration, Important terms like Directory, File, Volume, Label, Drive name, etc.

UNIT 6: INTRODUCTION TO GUI USING WINDOWS OPERATING SYSTEM:

All Directory Manipulation: Creating directory, Sub directory, Renaming, Coping and Deleting the directory **File Manipulation:** Creating a file, deleting, coping, renaming a file

BLOCK III

UNIT 7: CONCEPT OF NETWORKING:

Networking Concepts, Types of networking (LAN, MAN AND WAN), Communication Media, Mode of Transmission (Simplex, Half Duplex, Full Duplex),

UNIT 8: ANALOG AND DIGITAL TRANSMISSION:

Analog and Digital Signals. Synchronous and Asynchronous Transmission, Different Topologies.

UNIT 9: INTERNET

Introduction to Internet, its working. Internet tools, browsers, protocols & plug-ins. world wide web(www), search engines & security issues on the internet.

TEXT BOOKS:

1. Leon and Leon; Introduction to Information Technology, Leon Tech World.
2. 1.Sinha, Kr. Pradeep and Preeti Sinha; Foundations of Computing, BPB Publication.
3. Jain, V.K.; Computers and Beginners

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – I**

BUSINESS COMMUNICATION

Sub. Code: MCA - 103

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: BASICS OF COMMUNICATION

Definition; methods; types; and principle of effective communication; barriers of Communication; business letters and layout

UNIT 2: TYPES OF COMMUNICATION

Written - Oral - Face-to-face - Silence - Merits and limitations of each type

UNIT 3: BUSINESS LETTERS

Need and functions of business letters; Planning & layout of business letter; Kinds of business letters; Essentials of effective correspondence.

BLOCK II

UNIT 4: ORAL COMMUNICATION

Meaning; nature and scope - Principles of effective oral communication - Techniques of effective speech - Media of oral communication (Face-to-face conversation - Teleconferences - Press Conference - Demonstration - Radio Recording - Dictaphone - Meetings - Rumor - Demonstration and Dramatisation - Public address system - Grapevine - Group Discussion - Oral report - Closed circuit TV). The art of listening - Principles of good listening.

UNIT 5: KINDS OF BUSINESS LETTER

Interview letter; appointment letter; Acknowledgement; promotion; enquiries; replies; orders; sales; circular; complaints.

UNIT 6: EFFECTIVE CORRESPONDENCE

Bank correspondence; insurance correspondence; Agency and correspondence with shareholders and directors

BLOCK III

UNIT 7: EFFECTIVENESS OF REPORT

Report writing; Agenda; minutes of meeting; memorandum; office; order; circular; notes

UNIT 8: MODERN COMMUNICATIONS

Modern forms of communication; Fax; mails; Video conferencing; internet; websites and their use in business.

UNIT 9: APPLICATION OF COMMUNICATION SKILLS

Group Decision-Making; Conflict and Negotiations; Presentation and Interviews; Speeches

SUGGESTED READINGS:

- 1) Business Communication - K. K. Sinha - Galgotia Publishing Company; New Delhi.
- 2) Media and Communication Management - C. S. Rayudu – Himalaya publishing House; Bombay.
- 3) Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons; New Delhi.
- 4) Business Communication (Principles; Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd.; New Delhi.
- 5) Business Communication - Dr. S.V. Kadvekar; Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications; Pune.
- 6) Business Correspondence and Report Writing - R. C. Sharma; Krishna Mohan – Tata Mc Graw-Hill Publishing Company Limited; New Delhi.
- 7) Communicate to Win - Richard Denny - Kogan Page India Private Limited; New Delhi.
- 8) Modern Business Correspondence - L. Gartside - The English Language Book Society and Macdonald and Evans Ltd.
- 9) Business Communication - M. Balasubrahmanyam - Vani Educational Books.
- 10) Creating a Successful CV - Siman Howard - Dorling Kindersley.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – I**

UNDERSTANDING C

Sub. Code: MCA - 104

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1 WHAT IS 'C'?

Review of Flow chart, History of C, Basic structure of C Programs, The C Character set, Constants, Variables and Keywords, Types of C Constants, Rules for Constructing Integer Constants, Rules for Constructing Real Constants, Rules for Constructing Character Constants, Types of C Variables, Rules for Constructing Variable Names, C Keywords, Data Types Integers Long Short, Integers Signed and Unsigned, Floats and Doubles, The First C Program

UNIT 2 C INSTRUCTIONS

C Instructions, Type Declaration Instruction, Arithmetic Instruction, Integer and Float, Conversions, Type Conversion in Assignments, Hierarchy of Operations, Associativity of Operators, Control Instructions in C

UNIT 3 OPERATORS AND FUNCTION

Types of operators, Precedence and Associativity, Expression Statement and types of statements, Console based I/O and related built-in I/O function, printf(), scanf(), getch(), getchar(), putchar(), Concept of header files, Preprocessor directives : #include, #define

BLOCK II

UNIT 4 THE DECISION CONTROL STRUCTURES

Need for Decisions, The if Statement, The Real Thing , Multiple Statements within if The if-else Statement, Nested if-else, Forms of if Use of Logical Operators The else if Clause Nested if-else, Use of Logical Operators, The else if clause

UNIT 5 LOOP CONTROL STRUCTURES

Loops, While loop, For loop, Nesting of loops, Odd loop, Do-while, Other Statements: Break Continue

UNIT 6 THE CASE CONTROL STRUCTURE

Deciaion Using Switch, Switch Versus If-else ladder, Go to Keyword

BLOCK III

UNIT 7 FUNCTIONS & POINTERS

Basic types of function, Declaration and definition, Function call, Types of function, Parameter passing, Call by value, Call by reference, Introduction to Pointers, Pointer Notation, Recursion.

UNIT 8 STORAGE CLASS

Automatic Storage Class, Register Storage Class, Static Storage Class, External Storage Class

UNIT 9 ARRAYS

What are Arrays, A Simple Program Using Array, More on Arrays, Array Initialization, Bounds Checking, Passing Array Elements to a Function, Pointers and Arrays, Passing an Entire Array to a Function, The Real Thing, Two Dimensional Arrays, Initializing a 2-Dimensional Array, Memory Map of a 2-Dimensional Array, Pointers and 2-Dimensional Arrays, Pointer to an Array, Passing 2-D array to a Function, Array of Pointers, Three Dimensional Array

REFERENTIAL BOOKS:-

1. Let us C-Yashwant Kanetkar.
2. Programming in C- Balguruswamy
3. The C programming Lang., Pearson Ecl – Dennis Ritchie
4. Structured programming approach using C-Forouzah &Ceilberg Thomson learning publication.
5. Pointers in C – Yashwant Kanetkar
6. How to solve it by Computer – R. G. Dromy
7. Introduction to algorithms – Cormen, Leiserson, Rivest, Stein

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – I**

FUNDAMENTALS OF DIGITAL ELECTRONICS

Sub. Code: MCA - 105

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: BOOLEAN ALGEBRA

Basics Laws of Boolean Algebra, Demorgan's Law, Boolean Laws, Logic Gates OR, AND, NOR, NAND, XOR & XNOR., Simplifications of Boolean equations using K-maps.

UNIT 2: CONVERSION

Code Conversion, (Binary, Octal, Hexadecimal), Overview of Gray codes and Excess – 3 codes. Complements – (r-1)'S complement – (r' S) complement, Sub. Of Unsigned number, Fixed-Point, Integer, Arithmetic Addition and Subtraction, Overflow, Floating Point, Error detection codes.

UNIT 3: ARITHMETIC CIRCUITS

Adder, Subtractor, Parallel binary adder/ Subtractor, binary multiplier and divider.

BLOCK II

UNIT 4: COMBINATIONAL CIRCUITS

Multiplexers, De-Multiplexers, decoders, encoders, Design of code converters.

UNIT 5: FLIP-FLOPS

S-R, D, J-K, T, Clocked Flip-flop, Race around condition, Master slave Flip-Flop, Realization of one flip-flop using other flip-flop

UNIT 6: SHIFT REGISTERS

Serial-in-serial-out, serial-in-parallel-out, parallel-in-serial-out and parallel-in-parallel-out, Bi-directional shift register.

BLOCK III

UNIT 7: COUNTERS

Ripple counter, Synchronous Counter, Modulo Counters, Ring Counter, Twisted Ring Counter.

UNIT 8: STORAGE DEVICES

Primary Memory (ROM and it's type – PROM, EPROM, RAM, PAL, PLA) Magnetic Disks – Floppy disks, Hard disks, Magnetic Tape, Pen Drive, Optical disks – CD ROM and Cache Memory.

UNIT 9: DIGITAL INTEGRATED CIRCUITS

Special Characteristics, Bipolar-Transistor Characteristics, RTL and DTL Circuits, Transistor-Transistor Logic (TTL), Emitter-Coupled Logic (ECL), Metal-Oxide Semiconductor (MOS), Complementary MOS (CMOS), CMOS Transmission Gate Circuits.

TEXT BOOKS

1. Moris Mano, "Digital Logic and Computer Design", PHI Publications, 2002
2. R. P. Jain, "Modern Digital Electronics", TMH, 3rd Edition, 2003.

REFERENCES:

- 1 R.L.Tokheim, "Digital Electronics, Principles and Applications", Tata McGraw Hill, 1999.
- 2 W.Gothman, "Digital electronics", PHI.
- 3 S. Salivahanan & S. Arivyhgan. "Digital circuits and design", Vikas Publication, 2001
- 4 Malvino Leach, "Digital Principles and Application", TMH, 1999.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – I**

PERSONALITY DEVELOPMENT & COMMUNICATION SKILLS -I

Sub. Code: MCA - 106

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: BASICS OF PERSONALITY DEVELOPMENT

Basics of Personality Development, Practical grammar basic fundamental of grammar and usage, how to improve command over spoken and written English with stress on Noun, Verb Tense and Adjective.

UNIT 2: EFFECTIVE COMMUNICATION

Sentence errors, Punctuation, Vocabulary building to encourage the individual to communicate effective and diplomatically, common errors in business writing.

UNIT 3: INTRODUCTION TO BUSINESS COMMUNICATION

Introduction to Business Communication: Basic forms of communication, Process of communication. Principles of effective Business Communication, 7 Cs.

BLOCK II

UNIT 4: MEDIA OF COMMUNICATION

Media of Communication: Types of communication: Barriers of communication

UNIT 5: BUSINESS LETTER WRITING:

Business letter writing: Need, Functions and Kinds. Layout of letter writing. Types of letter writing: Persuasive letters, Request letters, Sales letters, Complaints and Adjustments.

UNIT 6: DEPARTMENTAL COMMUNICATION:

Departmental Communication: Meaning, Need and types: Interview letters, Promotion Letters, resignation letters, newsletters, Circulars, Agenda, Notice, Office memorandums, Office orders, Press release.

BLOCK III

UNIT 7: BUSINESS WRITING

Aids to correct Business writing, Practical Grammar (basic Fundamentals), Sentence errors-Punctuation, Vocabulary building.

UNIT 8: BUSINESS ETIQUETTES

Business manners. Body language gestures, Etiquette of the written word, Etiquette of the telephone.

UNIT 9: HANDLING BUSINESS MEETINGS

Handling business meetings. Role plays on selected topics with case analysis and real life experiences.

TEXT BOOKS:

1. Wren & Mertin; *English grammar and composition*, 2003.
2. Sinha, K. K.; *Business Communication*, Galgotia Publishers, 2003.
3. Robinson, David; *Business Etiquette*, Kogan Page.
4. Rogets Thesaurus.

REFERENCE BOOKS:

1. .Hand Book of Practical Communication Skills-Chrissie Wrought,published by Jaico Publishing House.
2. Ray, Reuben; *Communication today – Understanding Creative Skills*, Himalaya Publishing House, 2001.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – I**

PRACTICAL – 1

Sub. Code: MCA - 107

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – II**

COMPUTER ARCHITECTURE

Sub. Code: MCA - 201

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION

Introduction to Computer Architecture, Architectural developments, Technological Developments, Performance Issue, Memory Locations & Memory Operations, Addressing Modes, Immediate Mode, Direct Mode, Indirect Mode, Indexed Mode, Other Mode.

UNIT 2: REGISTER TRANSFER AND MICRO-OPERATIONS:

Register transfer and Micro-operations, Register Transfer Language, Bus and Memory. Transfers, Arithmetic, Logic Micro-operations, Shift Micro-operations.

UNIT 3: BASIC COMPUTER ORGANIZATION AND DESIGN :

Instruction and instructions Codes, Computer instructions, Timing and Control, instruction Cycle, Memory Reference Instructions, Input-output and Interrupts; Complete Computer Description.

BLOCK II

UNIT 4: PROGRAMMING THE BASIC COMPUTER

Machine Language, Assembly Language, The assembler, program loops, programming Arithmetic and Logic, Subroutine, Inputs-Outputs programming.

UNIT 5: CONTROL

Micro-Programmed Control; Control Memory, Address Sequencing, Micro- programmed Example, Design of Control Unit.

UNIT 6: CENTRAL PROCESSING UNIT

General Register Organization Stack Organization Instruction Formats, Addressing Modes, Data and Transfer Manipulation, Program Control, Reduced Instruction Set Computer, Pipeline and Vector Processing parallel processing pipelining, Arithmetic Pipeline, RISC vs. CISC, Vector Processing, Arrays Processors.

BLOCK III

UNIT 7: COMPUTER ARITHMETIC

Addition and Subtraction, Multiplication Algorithms, Division algorithm, Floating-Point Arithmetic Operations, Decimal arithmetic Unit, Decimal Arithmetic Operations.

UNIT 8: INPUT-OUTPUT ORGANIZATION

Peripheral Devices, Input-Output interface, Asynchronous Data Transfer, Modes of Transfer, Priority interrupt, Direct Memory Access (DMA), input-output processors (IOP).

UNIT 9: PROCESS COMMUNICATION

Serial communication multiprocessors, Inter-connection structures, Inter-processor, Inter-processor Communication and Synchronization, Cache Coherence.

RECOMMENDED REFERENCE BOOKS

1. V.C. Hamacher, Z.C. Vranesic, and S.G. Zaky: Computer Organization, Mc Graw Hill International Edition.
2. John D. Carpinlli: Computer Systems Organization & Architecture Person Education Asia, 2001.
3. M. Morris Mano : Computer System Architectue, Prentice Hall of India.
4. John P. Hayes, Computer Architecture and Organization, Mc Graw Hill International Edition.
5. Vincent JP. Heuring and Harry f. Jorden : Computer Systems Design & Architecture, Addison Wesley, Pearson Education Asia, 2001.
6. James L. Antonakos: An Introduction to the Intel Family of Microprocessors, Pearson Education Asia, 2001.
7. Peter Norton's Introduciton to Computers, Third Edition, Mc Graw Hill.
8. Karen Miller: An Assembly Language Introduction to Computer Architecture, Oxford Universiry Press.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – II**

SYSTEM PROGRAMMING

Sub. Code: MCA - 202

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION TO SYSTEMS PROGRAMMING:

Introduction to Systems Programming, Introduction to Assembly Language Programming. Background - System software machine architecture - The simplified instructional computer – Traditional machines - RISC machines. Introduction to Instruction Formats, Data formats - Role of Base Register, Index Register.

UNIT 2: ASSEMBLERS

Assemblers - Basic Assembler functions - Machine dependent and machine independent - Assembler features - Assembler design - Assembler design options – Implementation-examples–AIX-Assembler

UNIT 3: LOADERS AND LINKERS

Loaders and linkers - Basic loader functions - Machine dependent features – relocation and program linking. Machine independent features - automatic library search, loader features - Loader design options – Linkage editors, Dynamic linking.

BLOCK II

UNIT 4: BOOT STRAP LOADERS

ROM, ROM-BIOS, Boot strap loaders and Implementation examples- MS-DOS.

UNIT 5: MACRO PROCESSORS

Macro Processors - Basic macro processor functions - Machine-independent macro processor features– Macro processor Algorithm and Data structures, Conditional Macro expansion, Recursive Macro expansion.

UNIT 6: GENERAL PURPOSE MACRO PROCESSORS:

General purpose macro processors. implementation examples - MASM Macro processor, ANSI C Macro language. Introduction to Software Tools, Text editors, Interpreters, Program Generators, Debug Monitors.

BLOCK III

UNIT 7: BASICS OF COMPILERS

Basics of Compilers: Basic compiler functions, different phases of compilers (Introduction only), Interpreters, P- code compilers.

UNIT 8: INTRODUCTION TO OPERATING SYSTEMS

Introduction to Operating systems - Basic principles – Batch processing - Multiprogramming – Timesharing systems and real-time systems - Parallel and distributed systems .

UNIT 9: COMPUTER SYSTEM STRUCTURE

Computer system structure – Computer system operation - I/O structure - structure - Storage Hierarchy - Hardware protection-General system architecture – Overview of the UNIX Operating System

TEXT BOOKS

1. Beck L.L., System Software - An introduction to Systems Programming, Addison Wesley (First 3 Modules)
2. Silberschatz, Galvin, Operating system (5th edition), Addison Wesley (4th Module)
3. Aho, Revi sethi, Compilers Principles, techniques & Toolss , Pearson edn. (4th module)

REFERENCE BOOKS

1. Dhamdhare D.M., Systems Programminmg & Operating Systems, Tata McGraw Hill
2. Bach M.J., The Design of the Unix Operating System, Prentice Hall India (module IV)
3. Godbole S., Operating Systems, Tata McGraw Hill

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – II**

OBJECT ORIENTED DESIGN & MODELING

Sub. Code: MCA - 203

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: OBJECT-ORIENTED ANALYSIS AND DATA MODELING

Object-Oriented Analysis and Data Modeling: Object Oriented Concepts, Object-Oriented Analysis Modeling, Data Modeling.

UNIT 2: OBJECT ORIENTED DESIGN:

Object Oriented Design: Origins Of Object Design, Object Oriented Design Concepts, Object Oriented Design Methods, Class and Object Definition, Refining Operations, Program Components and Interfaces, annotation for Object Oriented Design, Implementation of Details Design, An alternative Object Oriented Design Strategy, integrating OOD with SA/SD.

UNIT 3: OOPS CONCEPT & C++

OOPS concept, User Defined Types, Polymorphism, And Encapsulation. Getting Started With C++- Syntax, Data-Type, Variables, Strings, Functions, Exceptions and Statements, Namespaces And Exceptions, Operators, Flow Control, Functions, Recursion. Arrays and Pointers, Structures.

BLOCK II

UNIT 4: ABSTRACTING MECHANISMS

Abstracting Mechanisms: Classes, Private, Public, Constructors, Destructors, Member Functions, Static Members, References Etc. Class Hierarchy Derived Classes.

UNIT 5: INHERITANCE

Inheritance: Simple Inheritance, Polymorphism, Object Slicing, Base Initialization, Virtual Functions.

UNIT 6: OPERATORS

Prototypes, Linkages, Operator Overloading, Ambiguity, Friends, Member Operators, Operator Function, I/O Operators etc.

BLOCK III

UNIT 7: MEMORY MANAGEMENT

Memory Management: New, Delete, Object Copying, Copy Constructors, Assignment Operator, This Input /Output.

UNIT 8: EXCEPTION HANDLING

Exception Handling: Exceptions and Derived Classes, Function Exception Declarations, Unexpected Exceptions, Exceptions When Handling Exceptions, Resource Capture and Release etc.

UNIT 9: TEMPLATES AND STANDARD TEMPLATE LIBRARY

Templates and Standard Template library: Template Classes, Declaration, Template Functions, Namespaces, String, Iterators, Hashes, Iostreams and Other Type.

SUGGESTED BOOKS :

1. Herbert Schildts : C++ - The Complete Reference, Tata McGraw Hill Publications.
2. Balaguru Swamy : C++, Tata McGraw Hill Publications.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – II**

INTRODUCTION TO SOFTWARE ENGINEERING

Sub. Code: MCA - 204

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: SOFTWARE ENGINEERING HISTORY, ROLE & LIFE CYCLE:

Software Crisis, What is Software Engineering, Software Life Cycle Models.

UNIT 2: SOFTWARE QUALITY ASSURANCE:

Meaning of s/w quality, factors of quality assurance, SQA activities, levels of quality assurance, (testing and validation)

UNIT 3: CERTIFICATIONS

Certifications ISO and CMM model for quality assurance

BLOCK II

UNIT 4: ANALYSIS CONCEPTS AND PRINCIPLES:

Requirement Analysis, Communication Techniques , Analysis Principles, Software prototyping , Specification /Software Requirement Specification

UNIT 5: ANALYSIS MODELING:

Elements of the Analysis model, Data modeling, Functional modeling and Information Flow The mechanics of Structured analysis, The Data Dictionary, Overview of other classical analysis methods

UNIT 6: DESIGN CONCEPTS AND PRINCIPLES & DESIGN METHODS:

Software Design and Software, Engineering, The Design Process, Design principles, Design concepts, Effective modular design, Design Heuristics for effective modularity, The design model, Design documentation, Cohesion and Coupling

BLOCK III

UNIT 7: SOFTWARE TESTING

Functional testing, structural testing, test activities, debugging. Performance & Acceptance Criteria

UNIT 8: SOFTWARE MAINTENANCE:

Categories of maintenance, the maintenance process, maintenance models, reverse engineering, software reengineering, estimation of maintenance cost, configuration management, documentation

UNIT 9: SELECTION OF HARDWARE VENDOR & PLATFORM

Hardware Acquisition, Memory Processes, Peripherals, Benchmarking, Vendor Selection, Operating System, Languages Processes.

TEXT BOOKS:

1. Software Engineering A Practitioner's Approach Fifth Edition by Roger S pressman. McGraw Hill International Editions.
2. Software Engineering , K.K. Aggarwal & Yogesh Singh

REFERENCE BOOKS:

1. System analysis and design, Awad
2. System Analysis and Design , Lee
3. S/W Engg. Concepts, Fairley S/W Engineering by Pankaj Jalote

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – II**

ORGANIZATIONAL BEHAVIOR

Sub. Code: MCA - 205

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT-1 INTRODUCTION

Meaning of Organization Behavior; Disciplines Contributing To Organization Behavior Field; Role Of Organization Behavior In Today's Business Organizations

UNIT-2: UNDERSTANDING SELF

Perception: Nature and Importance; Perceptual Selectivity; Social Perception; Personality: Meaning; Personality Determinates; Personality Characteristics; Personality Development Theories

UNIT-3: MOTIVATION

Primary And Secondary Motives; Theories Of Motivation: Content And Process-Theories - V Room's Expectancy Theory; Porter-Lawler Model; Equity Theory of Work Motivation; Alderfers Erg Theory; Mc Clelland's Need Theory

BLOCK II

UNIT-4: LEARNING

Theories of Learning; Principles of Learning; Reinforcement And Its Application In Behavior Modification

UNIT-5: GROUP DYNAMICS & TEAM WORKING

Theories of Groups; Group Norms and Roles; Cohesiveness the Dynamics of Informal Groups

UNIT-6: LEADERSHIP

Leaders versus Managers; Theories Of Leadership: Trait Theory; Behavioral Theory; Fiedler's Contingency Theory; Hersey And Blanchard's; Situation Theory Leadership In 21st Century; Leadership Styles; Managerial Grid; Likert's Systems Of Leadership; Normative Model

BLOCK III

UNIT-7: MANAGEMENT OF CONFLICTS

Reasons and Types of Conflicts; Management of Interpersonal Conflicts and Organizational Conflicts

UNIT-8: ORGANISATIONAL CHANGE

Major Forces of Change; Resistance to Change; Process of Change; Developing Support for Change; Change Model.

UNIT-9: POWER

Meaning of Power; Source of Power; Implications for Performance and Satisfaction

SUGGESTED READINGS:

1. Management and Organisation behaviour by Dr Rajinder Sharma;
2. Managing Organisational Behaviour People skills for success S K Bhatia;
3. Organisational Behaviour by S Fayyaz Ahmad and Nazir Ahmad Gilkar and Javid Ahmad Darzi;
4. Organisational Behaviour Text and Cases by Uma Sekaran;

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – II**

PERSONALITY DEVELOPMENT & COMMUNICATION SKILLS-II

Sub. Code: MCA - 206

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: WRITING SKILLS

Project and report writing, and proposals – how to write an effective report, basics of project writing, paragraph writing.

UNIT 2: EFFECTIVENESS OF REPORT

Report Writing; Agenda; Minutes Of Meeting; Memorandum; Office; Order; Circular; Notes

UNIT 3: ORAL COMMUNICATION

Meaning; Nature And Scope - Principles Of Effective Oral Communication - Techniques Of Effective Speech - Media Of Oral Communication (Face-To-Face Conversation - Teleconferences – Press Conference – Demonstration - Radio Recording - Dictaphone – Meetings - Rumor - Demonstration and Dramatization - Public address system - Grapevine - Group Discussion – Oral report). The art of listening - Principles of good listening.

BLOCK II

UNIT 4: MODERN COMMUNICATIONS

Modern forms of communication; Fax; mails; Video conferencing; internet; websites and their use in business.

UNIT 5: PRESENTATION SKILLS

How to make a presentation, the various presentation tools, along with guidelines of effective presentation, boredom factors in presentation and how to overcome them, interactive presentation & presentation as part of a job interview, art of effective listening.

UNIT 6: RESUME WRITING SKILLS

Resume writing skills, guidelines for a good resume, how to face an interview board, proper body posture, importance of gestures and steps to succeed in interviews. Practice mock interview

in classrooms with presentations on self. Self introduction – highlighting positive and negative traits and dealing with people with face to face.

BLOCK III

UNIT 7: EFFECTIVE CORRESPONDENCE

Bank correspondence; insurance correspondence; Agency and correspondence with shareholders and directors

UNIT 8: APPLICATION OF COMMUNICATION SKILLS

Group Decision-Making; Conflict and Negotiations; Presentation and Interviews; Speeches

UNIT 9: LEADERSHIP

Quality of a leader, leadership quiz with case study, knowing your skills and abilities. Introduction to group discussion techniques with debate and extempore, increase your professionalism. Audio Video recording and dialogue sessions on current topics, Economy, education system, environment, politics.

TEXT BOOKS:

1. Essentials of Business Communication by Rajendra Paul, Sultan Chand & Sons Publisher.
2. Business Communication by D.D.Sehgal,V.K.Mittal and N.C.Garg, Ramesh Book Depot.
3. Reuben, Ray; *Communication today – understanding creating skills*, Himalaya Publishing House, 2001.

REFERENCE BOOKS:

1. E. H. McGraw, S. J.; *Basic Managerial Skills for All*. Fourth Edition, Prentice Hall of India Pvt. Ltd., New Delhi.
2. Stephen R. Covey; *The seven habits of highly effective people*.
3. Rogets Thesaurus

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – II**

PRACTICAL - II

Sub. Code: MCA - 207

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

FILE STRUCTURE & DATABASE CONCEPTS

Sub. Code: MCA - 301

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: FILE STRUCTURE AND ORGANIZATION

Introduction, Logical and Physical Files, File, File Structure, Logical and Physical Files Definitions, Basic File Operations, Opening Files, Closing Files, Reading and Writing, Seeking, File Organization, Field and Record structure in file, Record Types, Types of file organization, Files of Unordered Records (Heap Files), File of Ordered Records (Sorted Files), Hash Files, Over View of Indexes, Dense Index, Sparse Index.

UNIT 2: TREE STRUCTURED INDEXING

Introduction, Index Sequential Access Method (ISAM), Structure of index sequential File, B+ Tree: A Dynamic Index Structure, Operations on B+ Tree, Search, Insertion, c. Deletion

UNIT 3: DATABASES:

Requirement of databases, characteristics of the database, schemas and instances, Database architecture and data independence, database system environment, classification of DBMS SYSTEM, Database system utilities.

BLOCK II

UNIT 4: DATA MODELS

Data Models: Hierarchical Model, Network Model, and Relational Model. CODD Rules to convert DBMS to RDBMS

UNIT 5: RELATION DATA MODEL CONCEPTS:

Domain, attributes, tuples and relations, domain and entity and referential integrity by using different constraints, basic relational algebra operations, additional relational operations

UNIT 6: LANGUAGE AND SQL

DML, DDL, DCL, Sub queries, working with views.

BLOCK III

UNIT 7: CONSTRAINTS & RELATIONAL DATABASE DESIGN

Constraints like primary key, not null, check, foreign key and unique, indexing Relational database design using ER to Relational mapping, mapping ER model concept to relations, tuple relational calculus, Domain relational Calculus, Introduction to QBE Language.

UNIT 8: NORMALIZATION

Normalization –first normal form, second normal form and third normal form, Boyce-codd normal form.

UNIT 9: ER MODEL

Entity and Attributes, entity type, entity sets and value sets, Relationship types and degree, role names and recursive relationship, ER Model

TEXT BOOKS:

1. Fundamentals of Database System, Elmasri and Navathe, Pearson Education Asia.
2. Introduction to database, P. Desai

REFERENCE BOOKS:

1. Date, C.J: An Introduction to database system, Vol-I & Vol-II, Addison Wesley Publishing Company, 2000
2. Ramakrishnan R. and J. Gehrke, Database management Systems, Mc Grawhill, Company, Higher Education, 2000
3. Database System Concepts by F. Korth

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

HUMAN RESOURCE MANAGEMENT

Sub. Code: MCA - 302

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION TO H. R. M.

Definition and concept of H. R. M, difference between H.R.M. and Human Resource Development, Importance of H.R.M.- Activities and functions of HRM, Organization of H.R.M. department- Role of H.R.M Department Limitations of HRM-Challenges before H.R.M.

UNIT 2: HUMAN RESOURCES PLANNING

Definition and objectives of Human Resource planning process of Human Resource planning factors influencing estimation of Human Resources.

UNIT 3: CONCEPT OF RECRUITMENT

Recruitment policy-Sources of Recruitment, Selection procedure

BLOCK II

UNIT 4: PERFORMANCE APPRAISAL

Concept, Need and objectives of performance Appraisal- Process Performance, Appraisal Methods, Uses and limitations of Performance Appraisal, Promotion, Transfer, Demotion.

UNIT 5: TRAINING AND DEVELOPMENT

Meaning and Definition - Need, Objectives, Importance of Training, Training Methods-evaluation of Training Programme.

UNIT 6: WAGE AND SALARY ADMINISTRATION

Methods of wage payments-Employee Remuneration factors determining the level of remuneration- Profit sharing-Fringe Benefits and Employee services- Wages & Salary Administration

BLOCK III

UNIT 7: EMPLOYEE SEPARATION

Exit Policy, Voluntary Retirement Schemes, Lifetime employment without guarantee, Layoff, retrenchment.

UNIT 8: INDUSTRIAL CONFLICT AND DISPUTES

What are disputes, Cause of disputes, Settlement of disputes

UNIT 9: EMPLOYEE BENEFITS AND SERVICES

Factors influencing Benefits and Services, Employee Security Benefits, Old-age and Retirement Benefits, Employee Health and Safety, Accident Prevention, Safety Engineering

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

DATA STRUCTURES THROUGH C LANGUAGE

Sub. Code: MCA - 303

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: BASIC CONCEPT OF DATA REPRESENTATION

Abstract data types: Fundamental and derived data types. Representation, primitive data structures.

UNIT 2: INTRODUCTION TO ALGORITHM DESIGN AND DATA STRUCTURES.

Design and analysis of algorithm: Algorithm definition, comparison of algorithms. Top-down and bottom up approaches to Algorithm design. Analysis of Algorithm; Frequency count, complexity measures in terms of time and space. Structured approach to programming.

UNIT 3: ARRAYS:

Linear and list structures, Arrays: Representation of single and multidimensional arrays; sparse arrays- lower and upper triangular matrices and Tri-diagonal matrices,

BLOCK II

UNIT 4: STACKS AND QUEUES:

Stacks and Queues: Introduction and primitive operations on stack; Stack application: Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion from infix to postfix. Introduction and primitive operation on queues, D-queues and priority queues.

UNIT 5: LISTS:

Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion, searching, Two way lists and Use of headers

UNIT 6: TREES:

Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion;

BLOCK III

UNIT 7: MULTILEVEL INDEXING AND B-TREES:

Multilevel indexing and B-Trees: Introduction: The invention of the B-tree; Statement of the problem; Indexing with binary search trees; Multilevel indexing, a better approach to tree indexes; B-trees: working up from the bottom; Example for creating a B-tree.

UNIT 8: SORTING & SEARCHING TECHNIQUES:

Sorting Techniques: Insertion sort, selection sort, merge sort, heap sort. Searching Techniques: linear search, binary search and hashing

UNIT 9: FILE:

Physical storage devices and their characteristics, constituents of a file viz. Fields, records, fixed and variable length records, primary and secondary keys; File operations, Basic file system operations. File Organizations serial sequential, Indexed sequential, Direct, inverted, multilist, Hashing functions and collision handling methods.

TEXT BOOKS:

1. E. Horowitz and S. Sahani, "Fundamentals of Data Structures", Galgotia Booksource Pvt. Ltd.
2. R. S. Salaria, "Data Structure & Algorithms", Khanna Book Publishing Co. (P) Ltd., 2002.

REFERENCES:

1. P. S. Deshpande and O.G. Kakde, "C & Data Structure", Wiley Dreamtech, 1st Edition, 2003.
2. Y. Langsam et. al., "Data Structures using C and C++", PHI, 1999.
3. Schaum's outline series, "Data Structure", TMH, 2002

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

BUSINESS INFORMATION SYSTEM ANALYSIS & DESIGN

Sub. Code: MCA - 304

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION

Data, Information & Knowledge, IS needs and opportunities in the context of business process, Analysis of business processes. Design of IS to support and improve business processes.

UNIT 2: OVERVIEW OF SYSTEM

Overview of system analysis & design: - business Systems concepts, System Methodologies - Structured Analysis, Structured Design, Structured Programming, E-R Models, Prototyping, Case Tools

UNIT 3: PROJECT SELECTION

Project Selection --- Sources of Project Requests, managing Project Review & Selection, Preliminary Investigation, Feasibility Study --- Technical & Economical Feasibility, Operational Feasibility

BLOCK II

UNIT 4: SRS

System Requirements Specification & Analysis --- Fact Finding Techniques, Process Organization & Interaction, Data flow diagrams, Data Dictionaries, process organization and interactions. Decision analysis, Decision trees and tables.

UNIT 5: SYSTEM DEVELOPMENT STAGE

Data Input, Coding Techniques, Validating Input Data, Unit & Integration Testing, Testing Practices & Plans, System Controls,

UNIT 6: SYSTEM EVALUATION

Audit Trails, System Administration Plan, System Backup Plans, System Maintenance & Evaluation, Preparation of Physical sites & User Training.

BLOCK III

UNIT 7: DOCUMENTATION

Standards Documentation Techniques, Overview of Data Modeling

UNIT 8: SYSTEM DIAGRAM

Data Flow Diagram and Entity Diagram, Entity Relationships, Context Diagrams, System Modeling

UNIT 9: FACT FINDING TECHNIQUES

Introduction to System Investigation fact finding Techniques, Fact finding Techniques, Fact Recording Flow Diagrams

SUGGESTED READINGS:

1. Awad, Elias M; Systems analysis and design, New Delhi: Galgotia Publications,
2. Booch G; Object Oriented Analysis And Design, Addison Wesley
3. Brooks, Frederick P; Mythical man-month: Essays on software engineering, Delhi: Pearson Education Asia,.
4. Charette, R.N; Software engineering Risk Analysis and Management, Tata McGraw- Hill Publishing,.
5. Coles/Rowley; Access 7 Basic Skills, Letts Educational
6. Fairly, Richard E; Software engineering concepts, New Delhi: Tata McGraw- Hill Publishing,.
7. Humphrey, Watts S; Discipline for software engineering, Delhi: Pearson Education Asia,

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

SOFTWARE TESTING

Sub. Code: MCA - 305

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT I: INTRODUCTION

Introduction: Testing Concepts: Purpose of Software Testing, Testing aspects: Requirements, Test Scenarios, Test cases, Test scripts/procedures, Strategies for Software Testing, Testing Activities, Mistakes, Faults & Failures,

UNIT 2: WHITE-BOX TESTING

White-Box Testing, Basis Path Testing, Flow Graph Notation, Cyclomatic Complexity Deriving Test Cases, Graph Matrices, Control Structure Testing, Condition Testing, Data Flow Testing, Loop Testing.

UNIT 3: BLACK-BOX TESTING

Black-Box Testing, Graph-Based Testing Methods, Equivalence Partitioning Boundary Value Analysis, Comparison Testing, Orthogonal Array Testing,

BLOCK II

UNIT 4: TESTING FOR SPECIALIZED ENVIRONMENTS

Testing for Specialized Environments, Architectures, and Applications, Testing GUIs, Testing of Client/Server Architectures Testing Documentation and Help Facilities Testing for Real-Time Systems

UNIT 5: STRATEGIC APPROACH TO SOFTWARE TESTING

A Strategic Approach to Software Testing, Verification and Validation, Organizing for Software Testing.

UNIT 6: SOFTWARE TESTING STRATEGY

A Software Testing Strategy, Criteria for Completion of Testing, Strategic Issues, Unit Testing, Unit Test Considerations, Unit Test Procedures, Integration Testing, Top-down Integration, Bottom-up Integration,

BLOCK III

UNIT 7: SYSTEM TESTING

Regression Testing, Smoke Testing, Comments on Integration Testing, Integration Test Documentation, Validation Testing, Validation Test Criteria, Configuration Review, Alpha and Beta Testing, System Testing, Recovery Testing, Security Testing, Stress Testing, Performance Testing, The Art of Debugging. The Debugging Process, Psychological Considerations, Debugging Approaches.

UNIT 8: QUALITY CONCEPTS

Quality Concepts, Quality, Quality Control, Quality Assurance, Cost of Quality, The Quality Movement, Software Quality Assurance, Background Issues, SQA Activities,

UNIT 9: SOFTWARE REVIEWS

Software Reviews, Cost Impact of Software Defects, Defect Amplification and Removal, Formal Technical Reviews, The Review Meeting, Review Reporting and Record Keeping, Review Guidelines, Formal Approaches to SQA, Statistical Software Quality Assurance, Software Reliability, Measures of Reliability and Availability, Software Safety, Mistake-Proofing for Software, The ISO 9000 Quality Standards, The approach to Quality Assurance Systems, The ISO 9001 Standard, The SQA Plan

TEXT BOOKS:

1. William Perry, "Effective Methods for Software Testing", John Wiley & Sons, New York, 1996.
2. Cem Kaner, Jack Falk, Nguyen Quoc, "Testing Computer Software", Second Edition, Van Nostrand Reinhold, New York, 1993.
3. Boris Beizer, "Software Testing Techniques", Second Volume, Second Edition, Van Nostrand Reinhold, New York, 1990.
4. Louise Tamres, "Software Testing", Pearson Education Asia, 2002

REFERENCE BOOKS:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Fifth Edition, McGraw-Hill International Edition, New Delhi, 2001.
2. Boris Beizer, "Black-Box Testing – Techniques for Functional Testing of Software and Systems", John Wiley & Sons Inc., New York, 1996.
3. K.K. Aggarwal & Yogesh Singh, "Software Engineering", New Age International Publishers, New Delhi, 2003.
4. Marc Roper, "Software Testing", McGraw-Hill Book Co., London, 1994.
5. Gordon Schulmeyer, "Zero Defect Software", McGraw-Hill, New York, 1990.
6. Watts Humphrey, "Managing the Software Process", Addison Wesley Pub. Co. Inc., Massachusetts, 1989.
7. Boris Beizer, "Software System Testing and Quality Assurance", Van Nostrand Reinhold, New York, 1984.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

ELECTIVE - I

COMPUTER GRAPHICS

Sub. Code: MCA - 306

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION

Definition, Application areas of Computer graphics, Graphical user interface, Cathod ray tubes.

UNIT 2: RANDOM & RASTER DISPLAYS

Random scan displays, Raster scan displays (with introduction to flickering, interlacing, American standard video etc),

UNIT 3: HARDWARE

Color CRT monitors, Flat panel displays (Plasma Panels, Liquid crystal displays, Electroluminescent displays), Graphics software (GKS, PHIGS), Color Models (RGB, CMYK, HSV, Lookup tables etc.)

BLOCK II

UNIT 4: RASTER GRAPHICS ALGORITHMS

Raster Graphics Algorithms: Line drawing algorithms (DDA, Bresenham's algo), Circle and Ellipse drawing algorithms

UNIT 5: 2-D TRANSFORMATIONS

2-D Transformations and Projections: Transformations (Rotation, Reflection, shearing, scaling), Homogeneous coordinate representation, Translation.

UNIT 6: 3-D TRANSFORMATIONS

3-D Transformations: Transformations (Rotation, Reflection, shearing, scaling), Homogeneous coordinate representation, Translation.

BLOCK III

UNIT 7: 3-D PROJECTIONS

Projection classification, Parallel projections, Perspective projections (One point, Two).

UNIT 8: CLIPPING

Two dimensional Clipping, Viewing pipeline, window and viewport, Sutherland Cohen sub division algorithm, Cyrus-beck algorithm,

UNIT 9: VISIBLE SURFACE DETECTION METHODS

Classification of visible surface detection algorithm, Backface algorithm,, Depth sorting method, Area subdivision method etc.

SUGGESTED READINGS :

1. Donald Hearn and M. Pauline Baker : Computer Graphics, PHI Publications.
2. Plastock : Theory & Problem of Computer Gaphics, Schaum Series.
3. Foley & Van Dam : Fundamentals of Interactive Computer Graphics, Addison-Wesley.
4. Newman : Principles of Interactive Computer Graphics, McGraw Hill.
5. Tosijasu, L.K. : Computer Graphics, Springer-Verleg.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

ELECTIVE - I

WEB AUTHORING TOOLS

Sub. Code: MCA - 307

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I:

UNIT 1: HTML

HTML: Internet Language, Understanding HTML, Create a Web Page, Linking to other Web Pages, Publishing HTML Pages, Text Alignment and Lists, Text Formatting Fonts Control, E-mail Links and link within a page, Creating HTML Forms.

UNIT 2: CREATING WEB PAGE

Creating Web Page Graphics, Putting Graphics on a Web Page, Custom Backgrounds and Colours, Creating Animated Graphics.

UNIT 3: WEB PAGE LAYOUT

Web Page Design and layout, Advanced Layout with Tables, Using Style Sheets.

BLOCK II:

UNIT 4: INTRODUCTION TO JAVA SCRIPTS

Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

UNIT 5: XML

Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX Review of Applets, Class, Event Handling, AWT Programming

UNIT 6: SWING

Introduction to Swing: Applet Handling Swing Controls like Icons – Labels– Buttons – Text Boxes– Combo– Boxes – Tabbed Pains – Scroll Pains – Trees– Tables Differences between AWT Controls & Swing Controls

BLOCK III:

UNIT 7: INTRODUCTION TO PERL SCRIPTS

Why Perl? A Brief History of Perl, The Benefits of Using Perl, What Are the Negatives of Using Perl? What Can Perl Do? Running Perl, Variables in Perl, Arrays and Associative Arrays, File Handles and Operators, Working with Patterns, Subroutines.

UNIT 8: REFERENCES

Introduction to References, Using References, References and Arrays, References to Subroutines, References to File Handles, Using Symbolic References, What Is a Perl Module? Subroutines and Passing Parameters, Multiple Inheritance.

UNIT 9: OBJECT-ORIENTED PROGRAMMING IN PERL

Introduction to Modules, Classes in Perl, Methods, Overrides, Destructors, Inheritance, Overriding Methods, Binding Variables to Objects, The tie() Function, Tying Scalars, Tying to an Array, Tying to an Associative Array.

REFERENCE BOOKS : [HTML]

1. Elizabeth Castro, HTML 4, Pearson Education Asia.
2. D.S. Ray and E.J. Ray, Mastering HTML 4, Sybex Computer Books Inc.
3. Jeff Rule, DHTML, Tata Mc Graw Hill.
4. Joseph Schmuller, Dynamic HTML, Sybex Computer Books Inc.
5. Jason J manager, Javascript essentials, Osborne Mc Graw Hill.
6. Joel Sarkar, Principles of Web Design, Thomson Learning.
7. C Xavier, WWW Design with HTML, Tata Mc Graw Hill.
8. Don Gosselin, Java Script, Thomson Learning.

REFERENCE BOOKS : [JAVA PROGRAMMING]

1. H.M. Deitel and P.J. Deitel, Java How to Program, Pearson Education Asia.
2. E. Balagurusamy, Programming with Java, Tata McGraw Hill Pub. Co. Ltd; 2001.
3. Peter Norton, Peter Norton's Guide to Java Programming, Techmedia.
4. Ken Arnold, James Gosling, David Holmes, The Java Programming, Pearson Education Asia (Addison Wesley).
5. A. Drozdek, Data Structures and Algorithms in java, Vikas Publishing House, 2001.
6. J. Zukowski, Mastering Java 2.
7. Lafore, Data Structures & Algorithms in Java, Techmedia.
8. Gilbert, Object Oriented Programming in Java, Techmedia.

REFERENCE BOOKS: [PERL PROGRAMMING]

1. R.Allen Wyke, and Donald B. Thomas, Perl: A beginners guide, Tata Mc Graw Hill.
2. Jon Orwant, Perl 5, Techmedia.
3. Laura Lemay Perl in 21 days, Techmedia.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

ELECTIVE - I

INTERNET & WEBSITE MANAGEMENT

Sub. Code: MCA - 308

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION

Introduction to Internet, Internet Services, WWW, Working of Internet, Internet Connection Concepts, Introduction to internet,

UNIT 2: INTERNET CONCEPTS

DNS working, Configuring Internet Connection, Connecting LAN to Internet. Internet, Intranet, Extranet. Single User, Multi User, Server, Workstation, Client-Server environment, Computer Network,

UNIT 3: COMPUTER NETWORK:

Types of Computer Network : LAN, WAN, MAN : Network Protocols, Windows and GUI.

BLOCK II

UNIT 4: E-MAIL CONCEPTS

E-Mail Concepts - configuring E-Mail Program, Sending and Receiving Files through E-Mail, Fighting Spam, Sorting Mail, and Avoiding E-Mail Viruses.

UNIT 5: SEARCH ENGINES

Web Browsers, Search Engines, Categories of search Engines, Searching Criterion, Surfing the Net, Hypertext Transfer Protocol (HTTP), URL.

UNIT 6: OTHER INTERNET TOOLS

Other Internet Tools. Online Chatting , Messaging, and Conferencing Concepts, E-Mail mailing lists, Usenet newsgroup concepts- Reading USENET newsgroups, internet Relay Chat, Instant messaging, Web-Based chat rooms and discussion boards, Video conferencing. Streamlining

Browsing, Keeping track of Favorite Web Sites, Web Security, Privacy, and Site-Blocking.
Searching the Web – Audio and Video on the Web.

BLOCK III

UNIT 7: HTML

HTML : Internet Language, Understanding HTML, Create a Web Page, Linking to other Web Pages, Publishing HTML Pages, Text Alignment and Lists, Text Formatting Fonts Control, E-mail Links and link within a page, Creating HTML Forms.

UNIT 8: CREATING WEB PAGE

Creating Web Page Graphics, Putting Graphics on a Web Page, Custom Backgrounds and Colours, Creating Animated Graphics.

UNIT 9: WEB PAGE LAYOUT

Web Page Design and layout, Advanced Layout with Tables, Using Style Sheets.

SUGGESTED READINGS :

1. Dick Oliver : Tech Yourself HTML 4 in 24 Hours, Techmedia.
2. Satish Jain : "O" – Level Information Technology.
3. Craig Zacker : 10 minutes Guide to HTML Style Sheets, PHI.
4. V.K. Jain : "O" – Level Information Technology, BPB Publications.
5. Gill, Nasib Singh : Essentials of Computer and Network Technology, Khanna Books Publishing Co., New Delhi.
6. Margaret Levine Young : Internet - The Complete Reference.
7. Harley Hahn : The Internet - Complete Reference, TMH.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

ELECTIVE - I

MULTIMEDIA & ITS APPLICATION

Sub. Code: MCA - 309

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION

Introduction to multimedia technology-computers, communications and entertainment;

UNIT 2: FRAMEWORK FOR MULTIMEDIA

Framework for multimedia; M/M devices, presentation devices and the user interface; M/M presentation and authoring,

UNIT 3: SOUND & SPEECH

Digital representation of sound and transmission, brief survey of speech recognition and generation;

BLOCK II

UNIT 4: DIGITAL VIDEO AND IMAGE COMPRESSION

Digital video and image compression; JPEG image compression standard; MPEG motion video compression;

UNIT 5: DVI TECHNOLOGY

DVI technology; time-based media representation and delivery

UNIT 6: M/M SOFTWARE ENVIRONMENTS

M/M Software environments; limitations of workstation operating system; M/M system service; OS Support for continuous media

BLOCK III

UNIT 7: MEDIA STREAM PROTOCOL

Applications; media stream protocol; M/M file systems and information representation; data-media for M/M and Hypermedia information Applications of M/M; intelligent M/M system Desktop BR;

UNIT 8: VIRTUAL ENVIRONMENT

Virtual reality OS; distributed virtual environment system; virtual environment displays and orientation tracking; visually coupled system requirements intelligent VR software systems

UNIT 9: APPLICATIONS OF MULTIMEDIA

Applications of Multimedia, in various fields, such as medical, entertainment, manufacturing, Business, School, Home, Public Place, Electronic books, Tele shopping, Interactive Video and Audio, Games

TEXT BOOKS:

1. [TB1] Multimedia systems Design, PK Andleigh & K Thakrar, Prentics Hall PTR, 1996
2. [TB6] Multimedia Systems, Ed by John FK Buford, Addison-Wesley Publishing Co, 1994

REFERENCE BOOKS:

1. Web Multimedia Development dMiller, New Riders Publishing, 1996
2. The McGraw Hill Multimedia handbook, Ed by Jessica Keyes, McGraw Hill Inc, 1994
3. Multimedia making it work (MMW)- Tay Vaughan – (TMH)
4. Multimedia: Computing, Communication and Application (MCCA)- Steinmetz and Nahrstedt- (ITS)

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

ELECTIVE - I

NETWORK SECURITY AND CRYPTOGRAPHY

Sub. Code: MCA - 310

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION

Introduction: Networks and Communication, Issues in Network, Need for Network Security, What cryptography is about, Protocols, parties and adversaries, Cryptanalyst and computer security the rules of the game, Approaches to the study of cryptography, Phases in the cryptography's Development, Cryptanalysis-driven design.

UNIT 2: BLOCK CIPHERS

Block Ciphers: What is a block cipher? Data Encryption Standard (DES) Key recovery attacks on block ciphers, Iterated DES and DESX, Advanced encryption Standard (AES), Limitations of recovery key based security, Problems.

UNIT 3: ENCRYPTION AND DECRYPTION

Encryption and decryption, Conventional cryptography, Public-key cryptography, How PGP works, Keys, Digital signatures, Digital certificates, Validity and trust, Certificate Revocation, What is a passphrase, Key splitting?

BLOCK II

UNIT 4: SYMMETRIC ENCRYPTION

Symmetric Encryption: Some Symmetric Encryption schemes, Issues In privacy, Indistinguishability under chosen-plaintext attack, Example chosen-plaintext attacks, Communication Security, Authentication Protocols, E-Mail Security, Web Security, Social Issues

UNIT 5: PROGRAM SECURITY

Program Security: Secure Programs, Non-malicious Program Errors, viruses and other malicious code, Targeted Malicious code, controls

UNIT 6: MESSAGE AUTHENTICATION

Message Authentication: The setting, Privacy does not imply authenticity, Syntax of message-authentication schemes a definition of security for MACs

BLOCK III

UNIT 7: DIGITAL SIGNATURES

Digital signatures: Digital signature schemes, A notion of security, RSA based signatures

UNIT 8: Security in Network

Security in Network: Threats in Network, Network Security Controls, Firewalls, Intrusion Detection Systems, Secure E-mail.

UNIT 9: ADMINISTERING SECURITY

Administering Security: Security Planning, Risk Analysis, Organizational, Security, policies, Physical Security. Legal Privacy and Ethical Issues, in Computer Security. Protecting Programs and data, Information and the law, Rights of Employees and employers, Software failure, Computer Crime, Ethical issues in Computer Security, Case studies of Ethics.

SUGGESTED READINGS :

1. P. Pfleeger, Shari Lawrence Pfleeger Charles : Security in Computing, PHI.
2. William Stallings : Cryptography & Network Security, Pearson Education.
3. Charlie Kaufman, Radia Perlman, Mike Speciner: Network Security, Private communication in a public world, PHI.
4. Douglas R. Stinson : Cryptography – Theory and Practice, CRC Press.
5. Bruce Schneier, Niels Ferguson : Practical Cryptography, Wiley Dreamtech India Pvt. Ltd.

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

ELECTIVE - I

E-COMMERCE

Sub. Code: MCA - 311

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION E-COMMERCE

The Scope of Electronic Commerce, Definition of Electronic commerce, Electronic Commerce and the Trade Cycle, Electronic Markets, electronic Data Interchange, Internet Commerce, E-Commerce Frame work; E-Commerce applications; E-Commerce Consumer applications; E-Commerce organization applications. B2B, B2C, C2C.

UNIT 2: E-COMMERCE PRESENCE ON THE WEB

Identifying Web Presence Goals; The Browsing Behaviour Model; Online Marketing; E-advertising; Internet Marketing Trends; Target Markets; E Branding; Marketing Strategies. Developer Services; Data Services; Application Services; Store Services; Client Services.

UNIT 3: E-COMMERCE SOLUTIONS

Types of E-Commerce Solutions- Direct Marketing and Selling; Supply Chain Integration; Corporate Procurement; EDI.

BLOCK II

UNIT 4: APPLICATION OF E COMMERCE

Application of E Commerce in Direct Marketing and Selling; Value Chain Integration; Supply Chain Management; Corporate Purchasing; Financial and Information Services; Obstacles in adopting E-Commerce Applications; Future of E Commerce.

UNIT 5: INFORMATION AND STRATEGY

Information and Strategy; The virtual value chain; seven dimensions of ecommerce strategy; planning E-commerce project; E-commerce strategy and knowledge management; E-Business Strategy and Data Warehousing and Data Mining.

UNIT 6: REQUIREMENTS OF INTELLIGENT WEBSITES

Requirements of Intelligent Websites; Website Goals and Objectives; planning the budget; analyzing website structure; fixed versus flexible webpage design; choosing a page size;

BLOCK III

UNIT 7: WEBSITE DEVELOPMENT TOOLS

Website development tools; design alternatives; outsourcing web design; testing and maintaining websites.

UNIT 8: ELECTRONIC PAYMENT SYSTEMS

Overview of Electronic Payment Systems; Cybercash (Customer to Merchant Payments; Peer to Peer Payments; Security). Smart Card (Card Types; Closed or Open Security; Privacy; Card Costs; Non Card Costs); Electronic Banking; Electronic Fund Transfers.

UNIT 9: EDI

EDI; EDI Implementation; Value added networks Work Flow; Automation Customization and internal Commerce; Supply chain Management.

SUGGESTED READINGS:

1. Doing Business on the Internet E-COMMERCE (Electronic Commerce for Business) S. Jaiswal; Galgotia Publications.
2. E-Commerce An Indian Perspective; P.T. Joseph; S.J.; PHI.
3. Frontiers of electronic commerce – Kalakata; Whinston; Pearson.
4. E-Commerce fundamentals and applications Hendry Chan; Raymond Lee; Tharam Dillon; Elizabeth Chang; John Wiley.
5. E-Commerce; S. Jaiswal – Galgotia.
6. E-Commerce; Efrain Turbon; Jae Lee; David King; H. Michael Chang.
7. Electronic Commerce – Gary P. Schneider – Thomson.
8. E-Commerce – Business; Technology; Society; Kenneth C. Taudon; Carol Guyerico Traver

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

ELECTIVE - I

E-BANKING AND SECURITY TRANSACTIONS

Sub. Code: MCA - 312

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1 INTRODUCTION :

Definition, Transaction websites components, E-Banking support services, Wireless Banking

UNIT 2: E-BANKING RISK :

Transaction/Operation Risk, Credit Risk, Liquidity/Internet Risk, Price Risk, Strategic Risk, Reputation Risk

UNIT 3: RISK MANAGEMENT OF E-BANKING ACTIVITIES :

Board of Management oversight, Managing outsourcing relationship, Information security Program Administrative control, Legal and compliance Issue

BLOCK II

UNIT 4: LAWS REGULATION AND GUIDELINES:

Electronics money, Regulating e-transactions, Role of RBI and Legal issues, Transnational transactions of E-Cash, Credit Card and Internet, Laws relating to Internet credit cards, Secure Electronic Transitions

UNIT 5: E-SECURITY:

Introduction to New Challenges and new Threats, Security, Legal consideration

UNIT 6: SECURING BANKING TRANSACTIONS WITH ENCRYPTION

Encryption and decryption, Conventional cryptography, Public-key cryptography, How PGP works, Keys, Digital signatures, Digital certificates, Validity and trust, Certificate Revocation, What is a passphrase, Key splitting.

BLOCK III

UNIT 7: SECURING BANKING TRANSACTIONS WITH SYMMETRIC ENCRYPTION

Symmetric Encryption: Some Symmetric Encryption schemes, Issues In privacy, Indistinguishability under chosen-plaintext attack, Example chosen-plaintext attacks, Communication Security, Authentication Protocols, E-Mail Security, Web Security, Social Issues

UNIT 8: DIGITAL SIGNATURES

Digital signatures: Digital signature schemes, A notion of security, RSA based signatures

UNIT 9: SECURITY IN E-BANKING NETWORK

Security in Network: Threats in Network, Network Security Controls, Firewalls, Intrusion Detection Systems, Secure E-mail.

REFERENCES :

1. Mark O' Neill "Web Services Security"
2. Nixon Brian "Teach yourself E-Banking"
3. E-Banking: Global Perspective by Vivek Gupta, Edition June 2000, ICFAI University Press

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – III**

ELECTIVE - I

PRACTICAL – V

Sub. Code: MCA - 313

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – IV**

OPERATING SYSTEM

Sub. Code: MCA - 401

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: OPERATING SYSTEM OVERVIEW

Operating Systems Overview: History of Operating System, Operating Systems Architecture, Operating Systems as an Extended Machine & Resource Manager,

UNIT 2: CLASSIFICATION OF OPERATING SYSTEM

Operating systems classification; Batch, Distributed, Parallel, Time Sharing, Real time System, Multi-user, Multitasking,; Multiprogramming.

UNIT 3: GROWTH OF OPERATING SYSTEM

Operating systems and system calls, Structure Monolithic System, Layered Systems, Virtual Machines, Client Server Model. Latest Operating system.

BLOCK II

UNIT 4: PROCESS MANAGEMENT

Process Concept, Processes Transition, Process Scheduling, Operation on process. Introduction to cooperative and concurrent processes. Inter process communication.

UNIT 5: CPU SCHEDULING & HANDLING DEADLOCKS

Scheduling Criteria, Scheduling Algorithms (FCFS, SGF, Priority, RR), Conditions for deadlock, Methods of handling deadlock Prevention, Avoidance, Detection.

UNIT 6: MEMORY MANAGEMENT

Memory Management concept, Memory allocation, Memory Management techniques, Swapping, Paging and segmentation. Virtual Memory-demand Paging. Page Replacement algorithms, Allocation of Frames, Thrashing.

BLOCK III

UNIT 7: FILE MANAGEMENT

File concept, file structure, file Access, File operation, File Attributes, Directories-Directory structure, path Names, Directories operations file allocation Methods: Contiguous Linked indexed, free space Management Directory Implementation. File sharing, file locking, symbolic links; file protection and security : distributed file systems.

UNIT 8: DEVICE MANAGEMENT FUNCTION

Device Management function: I/O devices and controllers, interrupt handlers, device independent I/O software, user-space I/O software; disk scheduling; clock hardware software; terminal input/output software.

UNIT 9: CONCURRENT PROGRAMMING

Concurrent programming: sequential and concurrent process; precedence graph, Bernsterins condition; time problem, classical process co-ordination problems, deadlock handling, Inter-process communication.

TEXT BOOKS

1. Operating System Concepts, Silberschatz Galvin
2. Modern operating systems, A.S. Tannenbaum

REFERENCES BOOKS:

1. UNIX, concepts and applications, Sumitabha Das
2. Operating systems, Concept and design, Milenkovic

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – IV**

DATA COMMUNICATION

Sub. Code: MCA - 402

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION

Concepts of Communication: Data, Signal, Channel, Bandwidth, Bid-Rate and Baud-Rate
Fourier Analysis; Maximum Data-Rate of a Channel.

UNIT 2: DATA ENCODING

Data Encoding Techniques; Modulation Technique, Protocols and Standards.

UNIT 3: NETWORK TOPOLOGIES

Network Topologies (Bus; Star; Ring; Star Bus; Star Ring and Physical Mesh, network transmission, transmission modes, categories of networks, advantages of computer networks. Clients; Servers and Peers based and Hybrid Networks; Server types

BLOCK II

UNIT 4: OSI AND TCP/IP MODELS:

Layered architecture, functions of the layers, TCP/IP Protocol suite, comparison of models

UNIT 5: TRANSMISSION MEDIA:

Guided and unguided media, Transmission impairment, Shannon capacity

UNIT 6: INTRODUCTION TO SIGNALS & MULTIPLEXING

Analog and digital signals, Periodic and A periodic signals, time and frequency domains, composite signals. Many to one, one to many, WDM, TDM, FDM

BLOCK III

UNIT 7: DATA LINK CONTROL:

Line Discipline, Flow Control, Error Control, Parity; LRC; CRC; Hamming code

UNIT 8: DATA LINK PROTOCOLS

Concept of protocols, Asynchronous and Synchronous protocols, character and bit oriented protocols, connection oriented and connection-less protocols. Local Area Network: Ethernet, Token Bus, Token Ring, FDDI, 802.6 (DQDB)

UNIT 9: SWITCHING & INTERNETWORKING DEVICES:

Circuit switching, packet switching, message switching. Repeaters, bridges, gateways, routers, routing algorithms: Distance vector routing, Link state routing

SUGGESTED READINGS:

1. Behrouz A. Forouzan; “Data communication and Networking”; Tata McGraw-Hill; 2004.
2. James F. Kurose and Keith W. Ross; “Computer Networking: A Top-Down Approach Featuring the trdt ”; Pearson Education; 2003.
3. Larry L.Peterson and Peter S. Davie; “Computer Networks”; Harcourt Asia Pvt. Ltd.; Second Edition.
4. Andrew S. Tanenbaum; “Computer Networks”; PHI; Fourth Edition; 2003.
5. William Stallings; “Data and Computer Communication”; Sixth Edition; Pearson Education; 2000.
6. Networking Complete- 1st Edition 2002; BPB Publication (Text Book)
7. Mastering Local Area Networks By Christa Anderson & Mark Minasi – BPB Publication
8. Mastering Novell Netware-Currid C.C; C.A Gillett-BPB
9. MCSE: Networking Essentials Study Guide- Tata McGraw Hill Publication
10. Introduction to Local Area Networks
11. Computer Networks By- Tenen Baum- PHI Publication

**SYLLABUS
MASTER OF COMPUTER ADMINISTRATION
SEMESTER – IV**

PROGRAMMING IN VISUAL BASIC

Sub. Code: MCA - 403

Credits: 03

Total Marks: 100

Minimum Pass Marks: 40%

Internal Assessment: 40 Marks

University Examination: 60 Marks

BLOCK I

UNIT 1: INTRODUCTION TO GUI AND WINDOWS PROGRAMMING

- 1.1 GUI: Concept & Tools
 - 1.1.1 The Title Bar
 - 1.1.2 Menu System, Menus and the Menu Bar
 - 1.1.3 The Size Box
 - 1.1.4 System Menu box
 - 1.1.5 Icons
 - 1.1.6 Cursors
 - 1.1.7 Scroll Bars
 - 1.1.8 Tool Bar
 - 1.1.9 Client Area

UNIT 2: INTRODUCTION TO VISUAL BASIC ENVIRONMENT

- 2.1 Features of Visual Basic
- 2.2 Starting Visual Basic
- 2.3 The Environment
- 2.4 The Special Features of the Menu Bar
- 2.5 Customizing the Visual Basic Environment

UNIT 3: CONCEPTS IN VISUAL BASIC

- 3.1 Events
- 3.2 Modules
- 3.3 Methods
- 3.4 Procedure
 - 3.4.1 Function Procedures
 - 3.4.2 SUB Procedures
- 3.5 Event Procedure
 - 3.5.1 Creating an Event Procedure

- 3.5.2 Parts of an Event Procedure
- 3.6 General Procedures, Creating a General Procedure

BLOCK II

UNIT 4: WORKING WITH FORMS

- 4.1 Forms
- 4.2 Controls
- 4.3 Custom Controls
- 4.4 Properties
- 4.5 MDI Forms
 - 4.5.1 Create an MDI Application
 - 4.5.2 MDI Child Property

UNIT 5: WORKING MENUS

- 5.1 The Menu Editor
- 5.2 Creating a Menu
- 5.3 Creating Popup Menus
- 5.4 Growing Menus
- 5.5 Sub Menus

UNIT 6: PROGRAMMING IN VISUAL BASIC

- 6.1 Data Types
- 6.2 Variables
- 6.3 Constants
- 6.4 Operators in Visual Basic
 - 6.4.1 Arithmetic Operators
 - 6.4.2 Comparison Operators
 - 6.4.3 Logical Operators

BLOCK III

UNIT 7: ARRAY AND THE VARIOUS TYPES

- 7.1 Control Arrays
 - 7.1.1 Setting up the Control Array
 - 7.1.2 To Remove a Control Array
 - 7.1.3 To Add and Delete Controls at Run Time
- 7.2 User Defined Data Types
- 7.3 Control Structures
- 7.4 Unconditional Branch Statement
- 7.5 The With Statement
- 7.6 The Built-in Procedures of Visual Basic
- 7.7 Conversion Procedure
 - 7.7.1 String Manipulation

UNIT 8: CREATING AN APPLICATION

- 8.1 Creating an Application
 - 8.1.1 Defining the Problem
 - 8.1.2 Designing the User Interface
 - 8.1.3 Designing the Main Form
 - 8.1.4 Writing the Code

UNIT9: DATA ACCESS

- 9.1 Data Access Overview
- 9.2 The Jet Database Engine
- 9.3 Bound Data Controls
- 9.4 Connectivity through DAO and ADO
- 9.5 Overview of RDO
- 9.6 Retrieving Data using Structured Query Language (SQL)
- 9.7 Querying a Database

TEXT BOOKS:

1. 1. Teach yourself Visual Basic in 21 days - Techmedia Publication
2. Black Book of Visual Basic - Dream Tech Press

REFERENCE BOOKS:

1. Beginning in Visual Basic 6.0- Wrox Publication
2. 2. Mastering in Visual Basic - BPB Publication