For the session 2020-21 the syllabus have been adopted from Central Board of

Studies, Bhopal and Vikram University, Ujjian for UG and PG  respectively.

Principal

Govt. Arts and Science College

Ratlam (M.P.)

**Principal**
Govt. Arts & Science College
Ratlam (M.P.)

**VIKRAM UNIVERSITY, UJJAIN.**

**SYLLABUS**

**&**

**SEMESTER WISE SCHEME**

**M.Sc. (COMPUTER SCIENCE)**

**EFFECTIVE FROM JULY 2013 & ONWARDS**

**SEMESTER : FIRST**

| PAPER CODE | PAPER NAME | MARKS | | |
|---|---|---|---|---|
| | | EXTERNAL | INTERNAL | TOTAL |
| MSCS-1.1 | Discrete Mathematical Structure | 40 | 10 | 50 |
| MSCS-1.2 | Computer Organization and Architecture | 40 | 10 | 50 |
| MSCS-1.3 | Operating System and System Software | 40 | 10 | 50 |
| MSCS-1.4 | Object Oriented Programming using C++ | 40 | 10 | 50 |
| MSCS-1.5 | Practical-I (Based on MSCS 1.3) | 50 | - | 50 |
| MSCS-1.6 | Practical-II (Based on MSCS 1.4) | 50 | - | 50 |
| | | | TOTAL | 300 |

**SEMESTER : SECOND**

| PAPER CODE | PAPER NAME | MARKS | | |
|---|---|---|---|---|
| | | EXTERNAL | INTERNAL | TOTAL |
| MSCS-2.1 | **Theory of Computation** | 40 | 10 | 50 |
| MSCS-2.2 | Data Base Management System | 40 | 10 | 50 |
| MSCS-2.3 | Data Communication & Computer Network | 40 | 10 | 50 |
| MSCS-2.4 | Data Structures & Algorithm Using C++ | 40 | 10 | 50 |
| MSCS-2.5 | Practical-I (Based on MSCS 2.2) | 50 | - | 50 |
| MSCS-2.6 | Practical-II (Based on MSCS 2.4) | 50 | - | 50 |
| | | | TOTAL | 300 |

30/7/13

29/7/13

## SEMESTER : THIRD

| PAPER CODE | PAPER NAME | MARKS | | |
|---|---|---|---|---|
| | | EXTERNAL | INTERNAL | TOTAL |
| MSCS-3.1 | System Analysis and Design | 40 | 10 | 50 |
| MSCS-3.2 | Programming with Visual Basic | 40 | 10 | 50 |
| MSCS-3.3 | Compiler Design | 40 | 10 | 50 |
| MSCS-3.4 | Object Oriented Programming with JAVA | 40 | 10 | 50 |
| MSCS-3.5 | Practical-I (Based on MSCS 3.2) | 50 | - | 50 |
| MSCS-3.6 | Practical-II(Based on MSCS 3.4) | 50 | - | 50 |
| | | | TOTAL | 300 |

## FOURTH SEMESTER

| PAPER CODE | PAPER NAME | MARKS | | |
|---|---|---|---|---|
| | | EXTERNAL | INTERNAL | TOTAL |
| MSCS-4.1 | Internetwork Applications | 40 | 10 | 50 |
| MSCS-4.2 | Computer Graphics & Multimedia | 40 | 10 | 50 |
| MSCS-4.3 | Artificial Intelligence | 40 | 10 | 50 |
| MSCS-4.4 | Software Engineering | 40 | 10 | 50 |
| MSCS-4.5 | Practical-I (Based on MSCS 4.1) | 50 | - | 50 |
| MSCS-4.6 | Major Project | 50 | - | 50 |
| | | | TOTAL | 300 |

## FIRST SEMESTER

### MSCS 1.1: Discrete Mathematical Structures [M.M. 40]

### UNIT 1

Set Theory: Introduction, Sets and Elements, Universal Set and Empty Set, Subsets, Venn Diagrams. Relations: Introduction, Product Sets, Relations, Pictorial Representation of Relations, Composition of Relations, Types of Relations, Partial Ordering Relations.

### UNIT 2

Functions: Introduction, One-to-One, Onto, and Invertible Functions, Cardinality. Logic and Propositional Calculus: Introduction, Propositions and Compound Propositions, Basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions.

### UNIT 3

Counting: Introduction, Basic Counting Principles, Factorial Notation, Binomial Coefficients, Permutations and Combinations. Pigeon hole Principle.

### UNIT 4

Graph Theory: Introduction, Graphs and Multigraphs, Subgraphs, Paths, Connectivity, Weighted Graphs, Complete, Regular and Bipartite Graphs. Directed Graphs: Introduction, Rooted Trees, Graph Algorithms: Depth first and Breadth-First Searches.

### UNIT 5

TREES AND CUT - SETS : Paths and Circuits, Shortest Paths, Eulerian Paths and Circuits, Hamiltonian Paths and Circuits. Rooted Trees, Path Lengths in Rooted Trees, Binary Search Trees. Spanning Trees, Minimum Spanning Trees.

**Text Books**

1  Elements of Discrete Mathematics, C.L.Liu, Second Edition, TMH
Reference Books

1  Discrete Mathematics and its applications, Kenneth H. Rosen, (Fifth Edition), Tata McGraw Hill Publishing Company.
2  Theory and Problems of Discrete Mathematics, Semmour Lipschutz, Marc Lipson, Second Edition, Schaum's Outline, T.M.H.

**FIRST SEMESTER**

## MSCS 1.2: Computer Organization and Architecture [M.M. 40]

### UNIT 1

Binary Systems: Digital Computers and Digital Systems, Binary Numbers, Number Base Conversion, Octal and Hexadecimal Numbers, Complements, Binary Codes. Boolean Algebra and Logic Gates: Boolean Functions, Digital Logic Gates.

Simplification of Boolean Functions: The Map Method, Two and Three Variable Maps, Four Variable Map, Product of Sums Simplification, NAND and NOR Implementation, Don't-Care Conditions.

### UNIT 2

Combinational Logic: Introduction, Design Procedure, Adders, Subtractors, Code Conversion, Analysis Procedure. Combinational Logic with MSI and LSI: Binary Parallel Adder, Decoders, Multiplexers. Sequential Logic: Introduction, Flip-Flops, Triggering of Flip-Flops.

### UNIT 3

Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Flip-Flop Excitation Tables, Design Procedure, Design of Counters. Processor Logic Design: Introduction, Processor Organization, Arithmetic Logic Unit, Design of Arithmetic Circuit, Design of Logic Circuit, Design of Arithmetic Logic Unit, Status Register, Design of Shifter, Processor Unit.

### UNIT 4

Microcomputer System Design: Introduction, Microcompuer Organization, Microprocessor Organization, Instructions and Addressing Modes, Subroutines, and Interrupt.

### UNIT 5

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory. Input Output Organization: Peripheral Devices, Input-Output Interface, Direct Memory Access (DMA), Input-Output Processors (IOP).

### Text Books

1. Digital Logic and Computer Design, M. Morris Mano, P.H.I., Eastern Economy Edition.
2. Computer System Architecture (3rd ed..), M.Morris Mano, P.H.I., Eastern Economy Edition.

### Reference Books

1. Computer Architecture and Organization, J.P. Hays, McGraw Hill.
2. Digital Principle and Applications, Malvino and Leach
3. Digital Computer Fundamentals, Thomas C. Bartee

**FIRST SEMESTER**

**MSCS 1.3: Operating System and System Software**          [M.M. 40]

### UNIT 1

Overview of Operating System: Batch Processing, Multiprogrammed, Time-Sharing, Multiprocessor, Real-Time Systems. Operating System Structures: System Components, Operating System Services, System Calls, File Systems Interface: File Concept, Access Methods, Directory Structure.

### UNIT 2

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms. Deadlocks: Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Avoidance and Detection, Recovery from Deadlock.

### UNIT 3.

Memory Management: Background, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Segmentation with Paging, Virtual Memory: Background, Demand Paging, Page Replacement, Allocation of Frames.

### UNIT 4

Mass Storage Structure: Disk Structure, Disk Scheduling- FCFS, SSTF, SCAN Scheduling, Disk Management, Swap-Space Management.

### UNIT 5

System software and application software, layered organisation of system software. Assemblers, Macros, Compilers, Cross compilers, Linking and loading, Relocation.

**Text Books**
1. Operating Systems Concepts, A. Silberschatz, P.Galvin, G.Gagne, John Wiley & Sons, Inc.

**Reference Books**

1. Systems Programming and Operating Systems (Part II - Operating Systems), Dhamdhere, 2nd Edition, TMH
2. Donovan, J.J. : System programming, Mcgraw Hill,1972.
3. Dhamdhere. D.M.: Introduction to system software, Tata Mcgraw Hill Publ.comp. 1986

**FIRST SEMESTER**

## MSCS 1.4: Object Oriented Programming Using C++        [M.M. 40]

### UNIT 1

**Object Oriented Systems Development :** Introduction to traditional programming with C. Objectives of OOP, Object Oriented Analysis, Object Oriented Programming in C++: Concepts of Objects, Classes, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Dynamic Binding and Message passing.

### UNIT 2

Object modeling, Dynamic modeling, Events, Status, Scenarios, Event hate diagrams, Operations, State diagrams, Functional Models, Dataflow diagrams, Constraints specification, Relation of object, Functional and Dynamic models.

### UNIT 3

Tokens, Expressions and Control Structures, Classes and Objects, Overloading and information hiding, Function overloading, Operator overloading in C++, Memory Management: Constructors, Overloading of constructors, copy constructors, destructors.

### UNIT 4

**Inheritance :** Inheritance, Derived and base classes, Single, Multilevel, Hierarchical, Hybrid Inheritance, Protected member, overriding member function, class hierarchies, multiple inheritance, Containership

### UNIT 5

**Polymorphism :** virtual functions, late binding, pure virtual functions, abstract classes, friend functions, friend classes, static functions, this pointer, templates, function templates, Class templates.

**Text Books**

1. Object-Oriented Programming with C++: E. Balagurusamy, TMH, 2005

**Reference Books**

1. Object Oriented Programming in C++, Robert Lafore, Galgotia Publication.
2. Object Oriented Programming, Tomothy Budd, Pearson education.
3. Object Oriented Modelling and Design, J. Rambaugh, M. Blaha, W. Premerlani, F. Eddy, W. Lorensen, P.H.I.

SECOND SEMESTER

## MSCS 2.1: Theory of Computation [M.M. 40]

### UNIT 1

*Finite Automata & Regular Expression:* Finite State Systems, Basic Definitions, Nondeterministic Finite Automata, Finite Automata with ε-moves.

### UNIT 2

*Regular Expressions, Two-way Finite Automata, Finite Automata with Output, Applications of Finite Automata, Closure Properties of Regular Sets.*

### UNIT 3

*Context Free Grammars:* Motivation and Introduction, Context-free Grammars, Derivation Trees, Simplification of Context-free Grammars.

### UNIT 4

*Chomsky Normal Forms, The existence of inherently ambiguous context-free languages, Closure properties of Context Free Languages. Turing Machines: Introduction, The Turing Machine Model.*

### UNIT 5

*Turing Machines: Introduction, The Turing Machine Model. Representation of Turing Machine, Design of Turing Machine, Universal Turing Machine.*

### Text Books

1 Introduction to Automata Theory, Languages & Computation, J E Hopcraft & JD Ullman, Narosa Publications.

### Reference Books

1 Theory of Computer Science, KLP Mishra & N Chandra Sekhar, PHI
2 Mathematical Foundations of Computer Science, Beckman

**SECOND SEMESTER**

## MSCS 2.2: DATA BASE MANAGEMENT SYSTEM                    [M.M. 40]

### UNIT-1

Introduction to data base system concepts : An overview of a data base system , basic data base system terminology.

### UNIT-2

Entity relationship model, E.R. diagram, data independence, data definition and manipulation languages . an architecture for a data base system.

Data models, relational model hierarchical model, network model.

### UNIT-3

Storage structure, relational algebra, relational calculus, relational query language and manipulation. Functional dependencies, Normal form 1NF, 2NF, 3NF, Good and bad Decomposition, BCNF, Multivalued Dependeccy, 4NF, Join Dependencies, 5NF.,

### UNIT -4

Decomposition, integrity, protection ,security, concurrency, distributed data base.
Database recovery: Introduction, Transactions, Transaction recovery, System recovery, Two-phase commit.

### UNIT -5

Concurrency control: Introduction, Concurrency Problem, Locking, Deadlock, Serializability, Intent Locking.

BOOKS :

1. Ullman J.D. : Data base management systems

2. Date C.J.  : Data base management systems vol. 1.

3. Korth    : data base management systems.

## SECOND SEMESTER

## MSCS 2.3 : Data Communication & Computer Network     [M.M. 40]

### UNIT 1
**Data Communication networks and system standards :** Data Communication networks and open system standards: Data communication networks, Standards. ISO reference model. The Electrical Interface: Transmission media. Attenuation and distortion sources.

### UNIT 2
**Data Transmission:** Data transmission basics. Asynchronous transmission. Synchronous transmission, Error detection methods. Data compression. Transmission control circuits. Communications control devices. Protocol basics: Error Control, Idle RQ, Continuous RQ, Link management.

### UNIT 3
**Local Area Networks :** Topology Transmission Medium , Medium Access Control Methods, ICSMA/CD Bus, Token Ring , Performance , Wireless LANs , Wireless Media, Protocols, Network Layer, Bridges, Bridges, Source Routing Bridges Transparent , Internetworking with different types, Introduction to WAN.

### UNIT 4
**Transport Protocol :** User Data Gram Protocol, TCP, Reliable Stream Service , Protocol Operations, Application support protocol, Session Layer, Token Concept, Presentation Layer, Data Encryption, Terminology, Message Authentication,

### UNIT 5

**TCP/IP Application protocols:** Introduction to TELNET , FTP , SMTP , SNMP , World Wide Web, Directory Services, Domain Name system.

### Text Books

1. Data Communications and Networking, Behrouz A. Forouzan, Tata McGraw Hill, 3rd Edition, ISBN 0-07-058408-7.

### Reference Books

1. Data Communications and Networks, Godbole A, Tata McGraw-Hill Publications.
2. Data Communications, Gupta P., PHI, 2004, ISBN 81 - 203 - 1118 - 3
3. Understanding Data Communications and Networks, Shay W., Third Edition, Brooks Kale Thomson Learning/Vikas Publishing House, ISBN 981-254-966-8

MSCS 2.4 : Data Structures & Algorithms Using C++          [M.M. 40]

### UNIT 1

Stacks and Queues : Introduction to Data Structures, ADT Stack and its implementation in C++, Evaluation of postfix expressions, ADT Queue and its implementation in C++.

### UNIT 2

Searching algorithms : Linked Lists: Defining & implementing linked lists with creation, insertion and deletion operations in C++, Sequential search & Binary search algorithms, Implementation in C++.

### UNIT 3

Sorting Algorithms: Implementation and Algorithm Analysis of Insertion sort, Selection sort, Merge Sort and Quick Sort.

### UNIT 4

Trees and Graphs : Definition and Implementation of ADT Binary tree, AVL Trees. Definition of Graph, Representation of Graphs, Graph Traversal methods.

### UNIT 5

Hash Tables, Hashing Functions, Overflow Handing, Chaining.
Fields, records, files, index techniques, cylinder-surface indexing, tree indexing-B-trees, trie indexing, file organizations.

**Text Books**

Introduction to Data Structures and Algorithms with C ++, GLENN W.ROWE, Prentice Hall India, 2003

**Reference Books**

Data Structures and Algorithms, Alfred V. Aho, John E. Hopecraft, Jaffrey D. Ullman, Pearson education.

**THIRD SEMESTER**

### MSCS 3.1 SYSTEMS ANALYSIS AND DESIGN          [M.M. 40]
### UNIT-1

Overview of system analysis and design, system development life cycle, project selection, feasibility analysis, design, implementation, testing and evaluation.

### UNIT-2

Feasibility study- Technical and economical feasibility, cost and benefit analysis.

### UNIT-3

System requirement specification and analysis: Fact finding techniques, Data flow diagrams, Data dictionaries, process organisation and interactions, decision analysis, decisin trees and tables.

### UNIT-4

Detailed design- Modularisation, module specification, file design, system development involving data bases. System Control and Quality Assurance- reliability and maintenance, Software design and documentation tools, top-down ,bottom-up and variants. Units and integration testing, testing practices and plans. System controls , Audit trails.

BOOKS:

1. James,A.S.: Analysis of design of Information systems,Mcgraw Hill 1986.

2. Ludeberg, M., Golkuhl, G. and hilsson,A. : Information systems development, Asystematis approach, Prentice Hall international 1981.

3. lesson,M.: System analysis and design, science research associates,1985

4. Sempriv,P.C.: System analysis-Definition Process and Design,1982

5. Richard,D.: System analysis design,Irwin Inc.1979.

6. Awad,E. Homewood : System analysis and design,Awad,Irwin 1979.

7. Lee, B.S. : Introducing System analysis and design 2 vols.Manchester United

   Kingdom, National computer centre,1978.

**THIRD SEMESTER**

## MSCS 3.2 PROGRAMMING WITH VISUAL BASIC  [M.M. 40]
### UNIT 1 :

Basic of Visual Basic : The Integrated Development Environment : The Menu Bar, The Toolbars,The Project Explorer, The Toolbox , The Properties Window, Your First/VB Project : Remaining and Saving the Project. The Elements of the User Interface . Programming an Application : Programming the command Buttons, Grouping Controls. Visual Development and Events-Driven Programming : A Few common Properties , A Few Common Methods, A Few Common Events .

### UNIT-2.

Customizing the Environment : The Editor Tab, The Editor Format Tab, The General Tab, The Docking Tab, The Environment Tab, The Advanced Tab. Visual Basic Projects : Building a Loan Calculator : Deciding How the Loan Application Works, Design the User Interface, Programming the Loan Application, Validating the Data. Building a Math Calculator : Designing the User Interface, Programming the Math Application, Adding More Features, Error Trapping. A Project's Files : The Project File, The Form File, Moving and Copying Projects, Executable files.

### UNIT - 3

Visual Basic : The Language. Variables : Declaring Variables, converting Variable Types, User-Defined Data Types, Special Values, Examining Variable Types, Forcing Variable Declarations, A Variable Declarations, A Variable's Scope The Lifetime of a Variable. Constants . Arrys : Declaring Arrays, Specifying Limits, Multidimensional Arrays, Dynamic Arrays, Arrays of Arrays.

### UNIT - 4.

Procedures : Subroutines, Functions , Calling Procedures Arguments : Argument-Passing Mechanisms, Using Optional Arguments, Passing an Unknown Number of Arguments, Named Arguments. Function Return Values : Functions Returning Custom Data Types, Functions Return Values Control flow Statements : If ... Then, If ... Then ... Else , Select Case, Loop Statements : Do Loop, For Next, While Wend, Nested Control Structures, The Exit Statement.

Working with Forms : An Application with Multiple Forms : The Startup Object The Appearance of Forms : The Start-Up Form, Loading, Showing, and Hiding Forms, Controlling One Form from within Another. Designing Menus : The Menu Editor, Programming Menu Commands, Building Dynamic forms at Runtime Drag-and-Drop Operations : The DragMode Property , TheDrag-Drop and DragOver Methods.

Text Book : Mastering in Visual Basic 6

**THIRD SEMESTER**

### MSCS 3.3 THEORY OF COMPILER DESIGN [M.M. 40]

### UNIT-1

Structure of a compiler, cross compiler, finite automata and lexical analysis : The roll of lexical analyzer ,design of lexical analyzer.

### UNIT-2

Regular expressions, finite automata, definite finite automata minimizing the no. of states of a DFA ,context free grammers.

### UNIT-3

Derivations and parse trees, basic parsing techniques, parses, shift -reduce parsing , operator precedence ,parsing, top-down parsing.

### UNIT-4

Run-time Storage administrations, implementation of a simple stack, allocation scheme.

Implementation of block structured languages, storage allocation in block, structured languages, code generator.

BOOKS :

1    Aho, ullman  :  Principles of compiler design.

THIRD SEMESTER

## MSCS-3.4 Object-Oriented Programming With Java [M.M. 40]
### UNIT -1

Java Evolution, Overview of Java Language : Java Program Structure, Java Tokens, Java Statements, Java Virtual Machine, Command Line Arguments. Constants, Variables and Data Types : Constants, Variables, Data Types, Scope of Variables, Symbolic Constants, Type Casting. Operators : Arithmetic, Relational, Logical, Assignment, Increment & Decrement, Conditional, Bitwise, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Type Conversions in Expressions, Operator Precedence and Associativity, Mathematical Functions.

### UNIT -2

Control Statements : Java's Selection Statements : If, Switch. Iterative Statements : While, Do-while, For, Some for loop variations, Nested Loops. Jump Statements : Using breaks, Using continue, return. Classes, Objects and Methods : Class Fundamentals, Declaring Objects, Assigning Object Reference Variables, Introducing Methods, Constructors, Visibility Control, The *this* Keyword, Garbage Collection, Overloading Methods, Recursion. Arrays, Strings and Vectors.

### UNIT -3

Inheritance : Inheritance basics, Using super, Creating Multilevel Hierarchy, Method Overriding, Dynamic Method Dispatch, Using Abstract Classes, Using *final* with Inheritance, The Object Class. Packages and Interfaces : Java API Packages, Using System Packages, Creating & Accessing Packages, Hiding Classes, Access Protection, Importing Packages, Interfaces : Defining, Implementing, Applying Interfaces, Variables in Interfaces. Exception Handling: Exception-Handling Fundamentals, Exception Types, Uncaught Exception, Using try and catch, Multiple catch Clause, Nested try Statements, throw, throws, finally, Java's Built-in Exceptions. Multithreaded Programming: Creating Threads, Extending the Thread Class, Stopping and Blocking a Thread.

### UNIT -4

Applet Programming : Preparing to write Applets, Building Applet Code, Applet Life Cycle, Creating and Executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, Passing parameters to Applet, Aligning the Display, Displaying Numerical values, Getting input from the User.

JDBC Connection and Implementation, Server side programming using Servlet and JSP.

### Text Books
1.    JAVA: The Complete Reference, Third Edition, P. Naughton & H. Schildt, Tata McGraw Hill.
2.    Programming with Java, Second Edition, E. Balagurusamy, Tata McGraw-Hill

### Reference Books
1.    Teach Yourself JAVA, Joseph O'Neil & Herb Schildt, McGraw-Hill.
2.    Object Oriented Programming with C++ and JAVA, D. Samanta, Prentice-Hall
3.    An Introduction to Java Programming, Daniel Liang Y, Prentice-Hall India.

FOURTH SEMESTER

## MSCS-4.1 INTERNETWORK APPLICATIONS [M.M. 40]

### UNIT - 1

TCP/IP Model : Comparison with ISO -OSI reference model. TCP/IP Protocol Family : Transport : Transmission Control Protocol, TCP Header Format, UDP Routing : IP Addressing , limitations , Brief overview of IPV6 i.e. the next generation IP, IP header format. Network Addresses : ARP, Domain Name System (DNS), RARP.

### UNIT-2

User Services /Applications : File Transfer Protocol (FTP) : Channel Connection, Command : internal & Users, Connections, debugging option with FTP, third party transfer, anonymous FTP, FTP Servers, TFTP, Telnet, BOOTP, Gateway Protocols : brief overview of EGP, CGP & IGP, Other protocols : NFS, NIS, RPC, SMTP, SNMP.

### UNIT - 3.
Internet : Uses, Goals/advantages, WWW, Intranet : Goals, benefits, how TCP/IP, bridges, routers, E-mail works in an intranet, Intranet and WWW : IP Networks, HTTP, Commands, Intranet applications : Overview of Web-Servers : essential & desirable features of a web server : authentication , authorization and encryption ; proxy services ; Subnetting an intranet.

### UNIT-4

Overview of an intranet security system : Security and access policies, Server Security, Firewalls, General Security. WAN : overview of DDS, T-1, T-3 , Frame Relay, Sonet, SMDS, ATM Services, WAN implementation, Connecting the LANs : Bridges, routers, Accessing WAN, Message handling system : X.400 & X.500 , Message Transfer Agents (MTA), Mailbox.

**Books:**

Douglas J. Comer : Internetworking with TCP/IP (Vol I)

Richard Stevens : Unix Networking

## FOURTH SEMESTER

### MSCS 4.2: Computer Graphics and Multimedia                    [M.M. 40]

#### UNIT 1

Overview of Graphic Systems: Display Devices, Refresh Cathode-Ray Tubes, Random-Scan and Raster-Scan Monitors, Color CRT Monitors, Direct-View Storages Tubes, Plasma-Panel Displays, LED and LCD Monitors. Hard-Copy Devices: Printers, Plotters. Interactive Input Devices.

#### UNIT 2

Output Primitives: Points and Lines, Line-Drawing Algorithms, DDA Algorithm, Bresenham's Line Algorithm, Antialiasing Lines, Circle-Generating Algorithms, Circle Equations, Bresenham's Circle Algorithm, Character Generation. Attribute of Output Primitives: Line Styles, Line Types, Line Width, Line Color. Color and Intensity: Color Tables, Gray Scale. Area Filling: Scan-Line Algorithm.

#### UNIT 3

Two Dimensional Transformations: Basic Transformations, Translation, Scaling, Rotation. Matrix Representations and Homogeneous Coordinates. Composite Transformations: Translations, Scalings, Rotations, Scaling Relative to a Fixed Point, Rotation about a Pivot Point, General Transformation Equation. Windowing and Clipping: Windowing Concepts, Cliiping Algorithms, Line Clipping, Polygon Clipping, Area Clipping, Text Clipping, Window to Viewport Transformation.

#### UNIT 4

Introduction to Multimedia, Multimedia Components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia Data and File Formats, RTF, TIFF, MIDI, JPEG, DIB, MPEG, Multimedia Tools, Presentation Tools, Authoring Tools. Computer Aided Design. Graphs Charts and Models. Computer Art, Computer Animation, Graphical User Interface, Graphics for Home use, Image Processing.

#### Text Books

1. Computer Graphics, Donald Hearn and M.Pauline Baker, PHI 2nd Edition
2. Multimedia Making it Works, Third Edition: Tay Vaughan, Tata-McGraw-Hill

#### Reference Books

1. Procedural Elements of Computer Graphics, Rogers, McGraw Hill
2. Principles of Interactive Computer Graphics, Newman and Sproull, McGraw Hill
3. Mathematical Elements of Computer Graphics, Rogers, McGraw Hill

FOURTH SEMESTER

## MSCS 4.3 ARTIFICIAL INTELLIGENCE [M.M. 40]

### UNIT-1

Introduction of Artificial Intelligence : What is AI ? The Importance of AI. AI and related fields. Intorudction to Natural Language Processing .

### UNIT-2

Knowledge : General Concepts, Definition and Importance of Knowledge, Knowledge based system, representation of Knowledge, Knowledge Organization , Knowledge Manipulation , Acquisition of Knowledge.

### UNIT-3

LISP AND AI PROGRAMMING LANGUAGES : Introduction to LISP : Syntax and Numeric Functions, Basic List Manipulation Functions in LISP , Functions, Predicates, and Conditionals, Input, Output, and Local Variables, Iteration and Recursion, Property List and arrays, PROGLOG and Other AI Programming Languages,

### UNIT-4

FORMALIZED SYMBOLIC LOGICS : Introduction , Syntax and Semantics for Propositional Logic , Syntax and Semantics for FOPL , Properties of Wffs , Conversion to Clausal Form, Inference Rules , The Resolution Principle , Representations Using Rules. Introduction to Expert System , Characteristics features of Expert System, Applications of Expert System. Importance of Expert System.

### BOOKS :

1. Clockskin, W.F. and Mellish, C.S. : Programming in prolog, Narosa publ. House.

2. Charniak, E. : Introduction of Artificial Intellegence, Narosa publ. House.

3. Winston,P.H. : LISP, NArosa publ. House.

4. Milner : Common LISP : A tutorial , Prentice Hall Inc. 1988.

5. Marcellus : Expert Systems Programming in TURBO PROLOG, P.H.I. 1989.

6. Elaime R. : Artificial Intelligence, 1983.

7. Hunt, E.B. : Artificial intelligence, Academic Press 1975.

FOURTH SEMESTER

## MSCS 4.4 SOFTWARE ENGINEERING [M.M. 40]

### UNIT-1

Introduction to Software Engineering : Software development, and life cycle; Project size and its categories; Planning a software project.

### UNIT- 2

Project control & Project team standards; Design of solution strategies; Software cost estimation and evaluation techniques.

### UNIT-3

Software Design : Various Design concepts and notations; Modern design techniques; Verification and validation methods; Documentation & implementation procedures; Performance of software systems; Software metrics and models. Documentation of Project-systems, manuals and implementation.

### UNIT-4

Software Reliability : Definition and concept of software reliability; software errors, faults, repair and availability; Reavailability & availability models; Use of database as a study tool. Modern Programming Language Features Relevant to Software Engineering: data abstraction, exception handling, concurrency mechanism, etc; Software development environments.

### BOOKS :

1. Fairley, B.E. : Software Engineering concepts, Mcgraw- Hill 1985.

2. Lewis, T.G. : Software Engineering concepts, Mcgraw Hill,1982.

3. Kernighan,B., Plauger, P. : software tools, Addison Wesley ,1976.

4. Meyers,G. : The Art of software testing, Wiley-inter- science,1979.

5. Gehani,N : Introduction of ADA, Mcgraw Hill, 1983.

6. Chatree : Software engineering concepts.

7. Hiborard : Constructing Quality software.