

INSTITUTE OF ADVANCED STUDIES IN
EDUCATION (DEEMED UNIVERSITY)
GANDHI VIDYA MANDIR
SARDARSHAHR

DETAILED SYLLABUS

FOR DISTANCE EDUCATION

Post Graduate Degree Program

**M. Sc.
Computer Science**

(SEMESTER SYSTEM)

COURSE TITLE : M.Sc Computer Science
DURATION : 02 Years (Semester System)
TOTAL DEGREE MARKS : 1600

FIRST SEMESTER

| <i>COURSE TITLE</i> | PAPER CODE | MARKS | | |
|----------------------------------|---------------------|---------------|------------------|--------------|
| | | THEORY | PRACTICAL | TOTAL |
| DISCRETE MATHEMATICAL STRUCTURES | MCS-110 | 100 | 00 | 100 |
| COMPUTER SYSTEM ARCHITECTURE | MCS-120 | 100 | 00 | 100 |
| DATA STRUCTURES & ALGORITHMS | MCS-130 MCS-130P | 50 | 50 | 100 |
| PC COMPUTING | MCS-140 MCS-140P | 50 | 50 | 100 |

SECOND SEMESTER

| <i>COURSE TITLE</i> | PAPER CODE | MARKS | | |
|---------------------------------------|---------------------|---------------|------------------|--------------|
| | | THEORY | PRACTICAL | TOTAL |
| OPERATING SYSTEM | MCS-210 MCS-210P | 50 | 50 | 100 |
| OBJECT ORIENTED PROGRAMMING USING C++ | MCS-220 MCS-220P | 50 | 50 | 100 |
| COMPUTER NETWORKS | MCS-230 MCS-230P | 50 | 50 | 100 |
| MICROPROCESSOR & INTERFACE DESIGN | MCS-240 | 100 | 00 | 100 |

THIRD SEMESTER

| <i>COURSE TITLE</i> | PAPER CODE | MARKS | | |
|-----------------------------|---------------------|---------------|------------------|--------------|
| | | THEORY | PRACTICAL | TOTAL |
| THEORY OF COMPUTATION | MCS-310 | 100 | 00 | 100 |
| INTERNET AND WEB DESIGNING | MCS-320 MCS-320P | 50 | 50 | 100 |
| PROGRAMMING IN JAVA | MCS-330 MCS-330P | 50 | 50 | 100 |
| DATABASE MANAGEMENT SYSTEMS | MCS-340 MCS-340P | 50 | 50 | 100 |

FOURTH SEMESTER

| COURSE TITLE | PAPER CODE | MARKS | | |
|----------------------|----------------------|--------|-----------|-------|
| | | THEORY | PRACTICAL | TOTAL |
| SYSTEM SOFTWARE | MCS-410/ MCS-410P | 50 | 50 | 100 |
| SOFTWARE ENGINEERING | MCS-420 | 100 | 00 | 100 |
| COMPUTER GRAPHICS | MCS-430/ MCS-430P | 50 | 50 | 100 |
| PROJECT | MCS-440P | ----- | 100 | 100 |

Note:

Theory Paper : 30% Continuous Internal Assessment and
70% University examination.

Practical Paper : 30% Continuous Internal Assessment and
70% University examination

Continuous Internal Assessment:

- 1) Two or three tests out of which minimum two will be considered for Assessment
60% of Continuous Internal Assessment
- 2) Seminars/Assignments/Quizzes
30% of Continuous Internal Assessment
- 3) Attendance, class participation and behavior
10% of Continuous Internal Assessment

FIRST SEMESTER

MCS-110 DISCRETE MATHEMATICAL STRUCTURES

Maximum Time : 3 Hrs. University Examination : 70 Marks
Total Marks : 100 Continuous Internal Assessment : 30 Marks
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Sets and Elements, universal set and Empty set, subsets, Venn Diagrams, Set Operations, Algebra of sets, Cartesian product, Relations, mappings, Countable and Uncountable sets, Domain and range, Relations Properties n any Relations. Representing Relations Closures of Relations Equivalence Relations Partial Orderings. Partially ordered sets, External elements of partial ordered sets, least upper bound and greatest lower bound, Lattices, Bounded lattices, Distributive lattices, complemented lattices.

SECTION B

Basics of Counting Pigeon hole principle permutation and combinations
Elements of Probability, Conditional probability, Baye's Theorem.
Algorithms Complexity of Algorithms
Recursive Definitions Recursive Algorithms
Recurrence relations Solving Recurrence Relations Divide and Conquer Algorithms and Recurrence Relations Generating Functions

SECTION C

Logic: Propositional and predicate logic
Boolean Functions, Sum Of product and Product of sum forms, Minimization of Boolean circuits, K-Maps.
Languages and Grammars, Finite State Machines, Regular expressions, ardens's theorem, Context free grammars, context free languages.

SECTION D

Introduction, Terminology , Isomorphism, Connectivity, Euler and Hamilton Paths , Shortest Path Problems, Planar Graphs, Graph Coloring

References :

1. A.S. Tanenbaum, "Structured Computer Organisation", PHI, 1990.
2. M. M. Mano, "Computer System Architecture", Prentice-Hall, 1976.
3. S. Stone, "Introduction to Computer Architecture", Galgotia Publications, 2nd Ed. 1986.
4. J.P. Hayes, "Computer Architecture and Organisation", McGraw Hill, 1988.
5. C. William Gear, "Computer Organisation and Programming", McGraw-Hill, 1985.

MCS-130

DATA STRUCTURES & ALGORITHMS

Maximum Time : 3 Hrs.

University Examination : 35 Marks

Total Marks : 50

Continuous Internal Assessment : 15 Marks

Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Space and time complexity, Asymptotic notations ($\Omega, \theta, O, \omega, \circ$), Arrays :- One Dimension and two Dimensional Arrays (Storage in Row – major & column major order).

Queue Structures: Insertion, deletion, Priority Queue, D-Queue.

Stack:- Push, Pop operations, Polish notation, Algorithm for Infix to Postfix conversion, Evaluation of Postfix expression.

Link lists, singly link list, Doubly link list, advantage and disadvantage.

SECTION B

Tree basic concept, Tree representation by link list and by arrays, Binary tree, Binary search tree (Operations:- Insertion, Deletion, Traversals), Heap sort, AVL, B-tree.

Graph concepts, Adjacency list and adjacency matrix representation, DFS, BFS, Topological sorting, strongly connected components, Prim's & Kruskal's algorithm, Dijkstra's algorithm, Warshall's algorithm.

SECTION C

Linear search, Binary search, Bubble sort, selection sort, Insertion sort, Quick sort, Heap sort, Merge sort, Bucket sort, Radix sort and their Comparison in terms of space & time complexity.

Divide & Conquer : General method, Binary search (Iterative & recursive), Merge sort, Quick sort, Selection, Strassen's matrix multiplication.

SECTION D

Greedy method :- General method, Fractional knapsack, Job sequencing with deadline, Prim's algorithm, Kruskal's algorithm,

Dynamic Programming: General method, All pair shortest path, 0/1 Knapsack problem, Traveling salesman problem, Longest common subsequence, Matrix chain multiplication.

Backtracking Method : General method, 8-Queen's problem, Sum of subset, Graph coloring,

Reference:

1. Horowitz Sahni Rajasekaran, "Fundamentals of computer Algorithms", Galgotia.
2. LipSchutz, "Theory and problems of Data Structures"(Schaum's outline series), TMH.

MCS -130P

DATA STRUCTURES & ALGORITHMS

Maximum Time : 3 Hrs. University Examination : 35 Marks

Total Marks : 50 Continuous Internal Assessment : 15 Marks

Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-130.

MCS-140

PC COMPUTING

Maximum Time : 3 Hrs. University Examination : 35 Marks

Total Marks : 50 Continuous Internal Assessment : 15 Marks

Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Definition of software, Type of software, Application Software, Definition of system software, Benefits of using software.

Windows 2000: - Windows concepts, features, windows structure, desktop, taskbar, start menu, my computer, Recycle Bin, Windows Accessories. System Tools

SECTION B

Word Processing: MS Word: - Introduction to Word Processing, Interface, Toolbars, Ruler, Menus, Keyboard Shortcut, Editing a Document, Previewing documents, Printing documents, Formatting Documents, Checking the grammar and spelling, Formatting via find and replace, Using the Thesaurus, Using Auto Correct, Auto Complete and Auto Text, word count, Hyphenating, Mail merge, mailing Labels Wizards and Templates, Handling Graphics, tables and charts, Converting a word document into various formats.

SECTION C

Worksheets: MS EXCEL - Creating worksheet, entering data into worksheet, heading information, data, text, dates, alphanumeric, values, saving & quitting worksheet, Opening and moving around in an existing worksheet, Toolbars and Menus, keyboard shortcuts, Working with single and multiple workbook, Working with formulas & cell referencing, Formatting of worksheet.

SECTION D

Introduction about Power Point, Presentation through Templates, Slide Transition.
Introduction about Ms Access, Definition of Data, Definition of Data base, Definition of Data base management system.

References:

1. Ramesh Bangia, "Cyber Tech. Educational Series Understating Microsoft 2000", cybertech.
2. Sanjay saxena, "Ms-Office 2000 for every one ", Vikas publishing

MCS -140 P

PC COMPUTING

Maximum Time : 3 Hrs.

University Examination : 35 Marks

Total Marks : 50

Continuous Internal Assessment : 15 Marks

Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-140.

SECOND SEMESTER

MCS-210

OPERATING SYSTEM

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Operating system as Resource Manager, Types of Operating system – Batch processing, Multiprogramming, Multitasking, Time sharing, Parallel Operating System, Distributed Operating System, system calls, process states, process control block (PCB), Cooperating process, Inter process communication.

CPU scheduling algorithms, (FCFS, RR, SJF, Priority, Multilevel queue, Multilevel queue with feedback) Multiple processor scheduling & their comparison.

SECTION B

Process synchronization, Critical section problem, Semaphore, Binary semaphores, critical regions, Monitors, Dekker's algorithm, Bakery algorithm, Semaphore solution of Bounded buffer, Reader writer Problem, Dining philosopher, Banker's algorithm.

Deadlock, Necessary conditions, Prevention, Avoidance and detection methods & recovery.

Disk scheduling (FCFS, SCAN,C-Scan, Look, C-Look)

SECTION C

Memory Management: Physical V/s Logical address, Dynamic linking, Dynamic loading, Swapping, contiguous allocation, paging, segmentation, and segmentation with paging.

Virtual Memory, Demand paging, page replacement algorithms, thrashing,

SECTION D

Distributed file system, naming and transparency, remote file access, remote file accesses, example systems – UNIX, Sun Network File System.

Protection and security, goals of protection, domain of protection, access matrix, security problem authentication, password, programs threats, system threats, encryption, computer security classification, Model of Windows-NT.

References:

1. Silberschatz and Galvin "Operating system concepts"(5th edition), Addison-Welsey publishing, Co 1999
2. Hansen, Per Brinch, "Operating system Principles" Prentice-Hall, 1984.
3. N. Habermanb, "Introduction of Operating system design" Galgotia Publication 1986.

MCS-210P**OPERATING SYSTEM**

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-210.

Maximum Time : 3 Hrs.**University Examination : 35Marks****Total Marks : 50****Continuous Internal Assessment : 15 Marks****Minimum Pass Marks : 40%****A) Instructions for paper-setter**

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

OOP paradigm, Advantages of OOP, Comparison between functional programming and OOP approach, characteristics of Object oriented Language objects, Class, Inheritance, Polymorphism, and abstraction, encapsulation, Dynamic Binding, Message passing.

Introduction to C++, Identifier and keywords, constants, C++ Operators, Type conversion, variable declaration, Statement, expressions, User defined data types, Conditional expression (For, While, Do-while) loop statements, breaking control statements (Break, Continue).

SECTION B

Defining a function, types of functions, Inline functions, Call by value & Call by reference, Pre-processor, Header files and standard functions, Structures, Pointers and structures, Unions, Enumeration.

SECTION C

Classes, Member functions, Objects, Array of objects, Nested classes, Constructors, Copy constructors, Destructors, Inline member functions, Static class member, friend functions, Dynamic memory allocation.

Inheritance: Single inheritance, Multi-level inheritance, Hierarchical, Virtual base class, Abstract classes, Constructors in Derived classes, Nesting of classes.

SECTION D

Function overloading, Operator overloading, Polymorphism, Early binding, Polymorphism with pointers, Virtual functions, Late binding, Pure virtual functions, Opening and closing of files, Stream member functions, Binary file operations, Structures and file operations, classes and file operations, Random access file processing.

Reference:

1. D. Ravichandran "Programming with C++" TMH, 1996.
2. Robert Lafore, "Object oriented programming in Turbo C++", Galgotia publications, 1994.
3. Bjarne strautrup, " The C++ Programming Language", Addison Welsly publication co. 1995.
4. Yashvant Kanetkar, "Let us C++", BPB.

MCS -220P**OBJCET ORIENTED PROGRAMMING IN C++****Maximum Time : 3 Hrs.****University Examination : 35 Marks****Total Marks : 50****Continuous Internal Assessment : 15 Marks****Minimum Pass Marks : 40%**

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-220.

Maximum Time : 3 Hrs.**University Examination : 35 Marks****Total Marks : 50****Continuous Internal Assessment : 15 Marks****Minimum Pass Marks : 40%****A) Instructions for paper-setter**

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Computer Networks: Uses of Computer Network, LAN, MAN, WAN, Network Hardware, Network Software, Connection Oriented and connection less services, Protocols Reference Models: OSI Reference Model, TCP/IP reference Model, Comparison of OSI and TCP Reference Model.

SECTION B

Physical Layer : Guided transmission media :Magnetic Media, Twisted Pair, Coaxial Cable, Fibre optics, Wireless transmission, Bitrate and Baud rate, Shannon's formula for maximum data rate.

Data link layer : Framing, Error control, Error detecting and correcting code, Cyclic redundancy check.

Flow control, sliding window, Go back N protocol, Selective Repeat, HDLC

MAC Protocol, ALOHA, CSMA/CD, Manchester Encoding, Ethernet.

SECTION C

Network layer : Services provided, routing algorithms, optimality principle, shortest path routing, flooding, distance vector, link state, broadcast, multicast.

Congestion control, load shedding, jitter control, leaky bucket algorithm.

The Internet Protocol - Introduction to Internetworking, The IP protocol, IP Addresses, Subnets, Internet Control Protocol, Interior and Exterior gateway routing protocol., internet multicasting mobile IP, CIDR, IPv6.

SECTION D

The Transport Protocol – Elements of transport protocol, A simple transport protocol, TCP-Service model, TCP protocol, Segment header, Connection management, Transmission policy, Congestion control, timer management, UDP.

Internet Applications: Domain Name System, Electronic mail, The World Wide Web, Multimedia - Audio, Video, Data compression, File Transfer Protocol, TFTP, Simple Mail Transfer Protocol, Telnet, HTTP.

References:

1. A.S. Tannenbaum, "Computer Networks", Third Edition, PHI Publications, 1999.
2. D.E. Corner, "Computer Networks and Internets", 2nd Edition, Addison-Wesley Publication, 2000.
3. D.E. Corner and D.L. Stevens, "Inter-networking with TCP_IP : Design, Implementation and Internals", Vol. II, Prentice Hall, 1990.
4. Frougan "Data communication an Networking", TMH.

MCS-230P

COMPUTER NETWORKS

Maximum Time : 3 Hrs.

University Examination : 35 Marks

Total Marks : 50

Continuous Internal Assessment : 15 Marks

Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-230.

Maximum Time : 3 Hrs.
Total Marks : 100
Minimum Pass Marks : 40%

University Examination : 70 Marks
Continuous Internal Assessment : 30 Marks

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Introduction to Microprocessors: Evolution of Microprocessor, Microcontroller, Embedded Microprocessor, Bit-Slice Processors, Microprogramming, RISC Vs CISC, Scalar and Super Scalar Processors, Vector, Symbolic and Array Processors, Digital Signal Processors, Transporters, Microprocessor with MMX technology, Different architectures of computers

SECTION B

Assembly Language of 8086, Debug and Assembler: Various Debug commands, Assembler Embedded Control, I/O Control and Co-Processor.

Intel 386 and 486 Microprocessors: 486Dx architecture, pin description, register organization, BIU and EU, Interrupts and exceptions of 80486, Lock, addressing modes of 80486, Protection and Gates of 80486.

SECTION C

Input/Output Devices, Memory and I/o addressing. 8086 Addressing and Decoding, Programmable I/O Ports, DMA, Interrupt controller, Memory controller, Floppy Disk controller, Hard Disk Interface, display interface, communication interface, Advanced Integrated Peripheral, Integrated system Peripheral, Multifunction Microprocessor, APIC, IOAPIC.

SECTION C

Other Microprocessors: Power Pc Microprocessor, Pentium Pro, Alpha, Cyrix, MIPS, SUN and SPARK Microprocessors.

Reference:

1. Badri Ram, "Advanced Microprocessor and Interfacing", TMH.

THIRD SEMESTER

MCS-310

THEORY OF COMPUTATION

Maximum Time : 3 Hrs.

University Examination : 70 Marks

Total Marks : 100

Continuous Internal Assessment : 30 Marks

Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Mealy, Moore machine, conversion of Moore machine to mealy machine and vice-versa, equivalence of NFA and DFA, minimization of states in DFA.

SECTION B

Regular expression, Removal of Null transitions, Arden's Theorem, Construction of Finite automata, equivalence of regular expression, Equivalence of two finite automata, Pumping lemma of Regular languages, closure properties of regular languages.

SECTION C

Ambiguity in CFG, Construction of reduced grammars, Elimination of NULL and Unit production, CNF, GNF, Pumping lemma for CFL, Properties of CFL, Construction of Push-Down Automata.

SECTION D

Turing machine model, construction of turing machines, Multitape – TM, Multi-track TM, Multi-head TM.

Post correspondence problem, Turing machine Halting problem.

Reference:-

1. Mishra Chandrasekran "Theory of computer Science"(3rd Edition), PHI
2. Hopcroft Motwani ullman "Introduction to Automata Theory Languages & Computation"(2nd Edition), Pearson Edition.
3. Kulkarni Sani, "A Mathematical Introduction to Automata Theory", Dhanpat rai & Co.

Maximum Time : 3 Hrs.**University Examination : 35 Marks****Total Marks : 50****Continuous Internal Assessment : 15 Marks****Minimum Pass Marks : 40%****A) Instructions for paper-setter**

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

INTRODUCTION TO THE INTERNET :- Computers in Business; Networking; Internet; Electronic Mail (E-Mail); Resource Sharing; Gopher; World Wide Web; Usenet; Telnet; Bulletin Board Service; Wide Area Information Service.

INTERNET TECHNOLOGIES :- Modem; Internet Addressing; Physical Connections; Telephone Lines.

SECTION B

INTERNET BROWSERS :- Internet Explorer; Netscape Navigator.

INTRODUCTION TO HTML :- Designing a Home Page; History of HTML; HTML Generations; HTML Documents; Anchor Tag; Hyper Links.

HEAD AND BODY SECTIONS :- Header Section; Title; Prologue; Links; Colorful Web Page; Comment Lines.

DESIGNING THE BODY SECTION :- Heading Printing; Aligning the Headings; Horizontal Rule; Paragraph; Tab Setting; Images and Pictures; Embedding PNG Format Images.

ORDERED AND UNORDERED LISTS :- Lists; Unordered Lists; Headings in a List; Ordered Lists; Nested Lists.

TABLE HANDLING :- Tables; Table Creation in HTML; Width of the Table and Cells; Cells Spanning Multiple Rows/Columns; Coloring Cells; Column Specification.

SECTION C

DHTML AND STYLE SHEETS :- Defining Styles; Elements of Style; Linking a Style Sheet to an HTML Document; In-line Styles; External Style Sheets; Internal Style Sheets; Multiple Styles.

FRAMES :- Frameset Definition; Frame Definition; Nested Framesets.

Forms :- Action Attribute; Method Attribute; Enctype Attribute; Drop Down List.

SECTION D

PHP-Basic Data Structures and Variables. ,Control Structures,Regular Expressions and Text Handling,References and Data Structures,Packages, Modules, Classes and Objects,Processing Web Forms.

XML: Learning about Elements,Using Start and End Tags,Understanding Attributes,Recognizing Markup and Character Data, CREATING A BASIC XML DOCUMENT,Setting Up an XML Document,Entering Elements,Adding Graphics,CONVERTING HTML DOCUMENTS TO XML,Inserting an XML Declaration,Specifying a Root Element,Establishing Proper Tag Structures,Correcting Attributes Modifying Entities

References:

1. Mansoor, "Internet and Web Design Made Easier", Pragya Publications, Matura.
2. V.K.Jain, "O level Module - M 1.2 - Internet & web page designing", BPB Publications.
3. P.T. Joseph, S.J. Presentice, "E-Commerce An Indian Perspective", (Second Edition), Hall of India
4. Alexis Leon and Mathews Leon, "Internet for Everyone", Vikas Publishing House Pvt. Ltd., New Delhi
5. "Internet for Dummies", Pustak Mahal, new Delhi.

MCS-320 P

INTERNET AND WEB DESIGNING

Maximum Time : 3 Hrs.

University Examination : 35 Marks

Total Marks : 50

Continuous Internal Assessment : 15 Marks

Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-320

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Introduction to Java: Features of Java, difference between Java and C, difference between Java and C++, data types, variables, arrays, operators-arithmetic, bitwise, relational, Boolean, various control statements.

SECTION B

Introduction to Classes: Class fundamentals, declaring objects, methods, constructors, garbage collection, passing parameters to methods, recursion, access control, static, final and finally method, Array Single dimensional, Multidimensional array.

SECTION C

Inheritance, super, multilevel hierarchy, abstract methods and classes. Packages and interfaces, importing packages, exception handling. Exception types, try, catch, finally, throw and throws, creating exception subclasses. Multithread programming, thread priorities, synchronization, messaging, creating multiple threads, inter thread communication.

SECTION D

Networking, socket overview, client/server, reserved sockets, proxy servers, Internet addressing, Java and the Net, TCP/IP client sockets. An introduction to AWT, GUI graphics, fonts, colours, Introduction of servlet, servlet lifecycle, JSP, JSP lifecycle.

References:

1. Patrick Naughton and Herbert Schildt, "The Complete Reference Java 2", Tata McGraw Hill, 1999.
2. E. Balaguru Swami, "Programming with Java"(2nd Edition), TMH.

MCS-330 P**PROGRAMMING IN JAVA**

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-330.

MCS-340**DATABASE MANAGEMENT SYSTEMS**

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Database V/s File system, Architecture of DBMS(External, Conceptual, Internal), Data Independence (Logical Physical) DBA and his responsibility, DBMS structure (DDL Compiler, Data manager, File manager, Disk Manager, Query Processor).

SECTION B

Entity, Entity Set, Attributes Keys(Primary, Secondary, Candidate, Super, Alternate), Mapping cardinalities, N-array relationships, E-R- Diagram, Hierarchical Model ,Relational Model, Network Model, Object oriented Model, Mapping of E-R diagrams to tables.

SECTION C

Anomalies in Design, Functional Dependency, Logical implications, Closure of FD, Canonical Core, Full and Partial FD, Prime and Non-prime attributes, 1-NF, 2-NF, 3-NF, BCNF, Decompositions, lossless and Dependency preservice.

SECTION D

Integrity rules (Entity integrity, Referential Integrity) Union, Difference, Intersection, Cartesian product Division, Projection, Selection, Joins.

Type calculus, Type calculus Formula, Domain calculus, SQL, Basic data retrieval, Data manipulation and table study comments, views,

Recovery techniques, check points, concurrency control, View & conflict serializability, Lock, based concurrency control, strict two phase locking, multiple granularity locking, time stamp based concurrency control.

References:

1. Bipin C. Desai, "An Introduction to Database Systems", Galgotia Publications Nt. Ltd.
2. Elmarni Navathe, "Fundamental of Database Systems", Pearson Edition.
3. C.J. Date, "An Introduction to Database System"(7th Edition) Pearson Edition.

MCS-340 P

DATABASE MANAGEMENT SYSTEMS

Maximum Time : 3 Hrs.

University Examination : 35 Marks

Total Marks : 50

Continuous Internal Assessment : 15 Marks

Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-340.

FOURTH SEMESTER SYSTEM SOFTWARE

MCS-410

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Introduction to systems software : Definition, features of system programming, system programming V/s Application programming, Types of system programs.

SECTION B

Assembler : Single pass assembler, two-pass assembler, and general design procedure of assembler.

Macro Processor : Macro language and its features, macro instructions, features of macro facility, implementation, one pass macro processor, two pass macro processor, macro assemblers.

SECTION C

Compilers : Overview of compilation process, lexical analysis, syntax analysis, semantic analysis, and intermediate code generation and code optimization techniques, compiler V/s Interpreter.

Linkers & Loaders : Simple linkers, Loaders, and design and implementation of direct linking loader.

Introduction to device drivers, Functions and structure of text editor.

Software tool:- Software tools for program development, Editors, Debug monitors, Programming Environment, User Interface.

SECTION D

Operating system : Basic concepts of an operating system, Functions of operating system as resource manager, I/O management, Memory management, Processor management, Information management, Types of operating system – Batch processing, Multiprogramming, Multitasking, time sharing, parallel, Distributed Operating System (With Examples).

References:

1. Donovan, "System programming", (McGraw-Hill), 1991.
2. Aho and Ulman, "Principle of Compilers", Narosa Publishing House, 1986
3. DM Dhamdhare, "System Programming and Operating Systems", (2nd Edition), TMH.

MCS-410 P**SYSTEM SOFTWARE**

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-410

MCS-420**SOFTWARE ENGINEERING**

Maximum Time : 3 Hrs. University Examination : 70 Marks
Total Marks : 100 Continuous Internal Assessment : 30 Marks
Minimum Pass Marks : 40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Phases in Software Development , Requirement Analysis , Software Design ,Coding , Testing, Maintenance. Software Development Process Model : Waterfall Model, Prototyping, Interactive Enhancement ,Spiral Model, Software Requirements Specifications (SRS) Role of SRS, Problem Analysis : Structuring Information – Data Flow Diagrams and Data Dictionary – Structured Analysis

SECTION B

Planning a software project – Cost Estimation Uncertainties in Cost Estimation – Single Variable Models : COCOMO Model – Software Size Estimation Project Scheduling : Average Duration Estimation Project Scheduling : Milestones, staffing and personnel Planning Rayleigh Curve : Personnel Planning Team Structure, Software Configuration Management Configuration Identification – Configuration Control – Status Accounting and Auditing – Software Configuration and Management
Quality Assurance Plans : Verification and Validation – Inspection and Reviews Output of a Software Development Project Project Monitoring Plans : Timesheets – Reviews – Cost – Schedule – Milestone Graph Risk Management : Risk Management Activities – Risk Identification – Risk Analysis and Prioritization Project Planning and Risk Management

SECTION C

Case study : Plan for the above problem System Design : Design Objectives, Design Partitionin problem Partitioning – Abstraction, Top-Down and Bottom-Up Strategies, Module Level Concepts Coupling and Cohesion, Design Methodology – Structured Design Structure Charts – Design Methodology – Transaction Analysis, Design Specification, Verification Design Reviews – Automated Cross – Checking Case Study : Structure Design – Design Document for the Given Problem Testing Fundamentals : Error Fault – Failures – Reliability Levels of Testing – Test Case and Test Criteria – Test Oracle Psychology of Testing – Top-Down and Bottom-Up Approaches

SECTION D

Functional Testing : Equivalence Class Partitioning – Boundary Value Analysis : Case Effect Graphing – Test Case Generations Instrumentation for Structural Testing – Complexity Based Criteria – Mutation Testing – Combination Functional and Structural Approaches, Testing Process Test Plan – Test Case Specification and Test Case Execution and Analysis, Comparison of Different V & V Techniques, Metrics : Reliability Assessment – Programmer Productivity – Error Removal Efficiency Case Study : Test Plan – Unit Test Report – Test Case Specifications for System Testing – System Test Report Error Report on a given problem

References:

1. P. Jalota, "An Integrated Approach to Software Engineering", Narosa Publishing House, 1992
2. R.E.Fairley, "Software Engineering Concepts", McGraw-Hill, 1985
3. G.Meyers, "The Art of Software Engineering", Wiley-inter-Science, 1979
4. M. Shooman, "Software Engineering", McGraw-Hill, 1983

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|---------------------------|-----------------|---------------------------------------|-------------------|
| Maximum Time | : 3 Hrs. | University Examination | : 35 Marks |
| Total Marks | : 50 | Continuous Internal Assessment | : 15 Marks |
| Minimum Pass Marks | : 40% | | |

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Input device - Keyboard, Touch Panel, Light pens, Graphic tablets, Joysticks, Touch balls, Image scanner, Mouse. Handy copy device :- Zero impact and Non impact printers, Dot matrix, Laser printer, Inkjet printer, Dectrostate, flatted and drum platters. Video display devices :- Cathode ray tube, Resistance, Resolution, aspect ration vertical and horizontal, colour CRT monitors, Direct view storage tube, Flat panel displays, LCD, virtual reality, Faster scan system, random scan system. Memory device :- Memory (RAM,ROM), CD, Floppy Disk, Magnetic tapes, Magnetic disks.

SECTION B

Scan conversion algorithm for line (DDA & Bresenham's algorithm) midpoint circle, circle & ellipse, Midpoint ellipse, Bresenham's algorithms, area filling techniques, Scan line polygon fill, Boundary fill character generation. 2-dimensional Graphics:- Cartesian & Homogeneous coordinate system, Geometric transformations Composite transformations, Affine transformation, Viewing pipeline, Two dimensional viewing transformation and clipping (Line, Polygon and Text).

SECTION C

Three dimensional Graphics :- Geometric transformation (translation, scaling, rotation, reflection, shearing) Composite transformations, Mathematics of projections (parallel & perspective), view pipeline, 3-D viewing transformations and clipping(normalized view volumes, view port, clipping)

SECTION D

Hidden line and surface elimination algorithms, Z-buffer, Scan-line, Sub-division, Painter's algorithm. Illumination Models : Diffuse reflection, Specular reflection, refracted light, texture surface patterns, Half toning, Dithering. Surface rendering methods : Constant intensity method, Gouraud shading.

Reference:-

1. D. Hearn and M.P. Baker "Computer Graphics" PHI New Delhi 2nd edition 1995.
2. J.D. Foley, A.V. Dam, S.K. Feiner, J.F. Hughes, R.L. Phillips, "Introduction to computer Graphics" Addison-Wesley Publishing company, N.Y. 2nd edition 1994
3. R.K. Plastock and G. Kalley " Computer Graphics " McGraw Hill, 1986.

MCS-430P**COMPUTER GRAPHICS**

Maximum Time : 3 Hrs. University Examination : 35 Marks
Total Marks : 50 Continuous Internal Assessment : 15 Marks
Minimum Pass Marks : 40%

The laboratory course will comprise of exercises on what is learnt in the theory classes of the same course i.e. MCS-410.

MCS-440 P**PROJECT**

Maximum Time : 3 Hrs. University Examination : 70 Marks
Total Marks : 100 Continuous Internal Assessment : 30 Marks
Minimum Pass Marks : 40%

1. Students are supposed to spend 45-55 hours on the project. The internal teacher must monitor progress of the Project. Students can arrange the project at their own level, however, Institute can also assist in getting the project and can issue necessary letters etc.
2. The external examiner will distribute marks allocated for University examination for viva/project report and for any other activity, which the external examiner thinks to be proper.

| | |
|---------------------------------------|------------|
| Maximum Marks for Project Application | 60% |
| Max marks for Viva | 40% |

3. Joint projects will be allowed and joint project reports will also be accepted. The students should highlight their contributions in a joint project report.
4. The students have to submit two copies of Project reports. The examiners will evaluate these reports on the spot at the time of examination and will conduct the viva.