PGDCA/MSc/MCA

Course Curriculum for

PGDCA First & Second Semester
M.Sc.(Computer Science)
Third & Fourth Semester
MCA Fifth & Sixth Semester

Scheme and Syllabus

Through Distance Education
(w.e.f. July 2007)

Directorate of Distance Education
Guru Jambheshwar University of
Science & Technology, Hisar

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS (PGDCA, Ist Year of 3Yrs MCA)

First Semester

		Max Marks		Total
Paper Code	Nomenclature of Paper	External	Internal*	
MS-01:	Introduction to IT	70	30	100
MS-02	Computer Programming and Problem Solving	70	30	100
MS-03	Digital Electronics	70	30	100
MS-04	System Analysis and Design	70	30	100
MS-05	Practical (Based on MS-01 & MS-02) (In two sittings each of 3 hrs duration)	70	30	100
Total		350	150	500

Second Semester

		Max Marks		Total
Paper Code	Nomenclature of Paper	External	Internal*	
MS-06:	Data Structure and Algorithms	70	30	100
MS-07	Computer Oraganisation and Architecture	70	30	100
MS-08	Operating System	70	30	100
MS-09	Business Data Processing	70	30	100
MS-10	Practical (Based on MS-06 & MS-07) (In two sittings each of 3 hrs duration)	70	30	100
Total		350	150	500

01. M. Sc. (COMPUTER SCIENCE) / 2 ND YEAR OF MCA (3 YRS.)

Third Semester

		Max Marks		Total
Paper Code	Nomenclature of Paper	External	Internal*	
MS-11:	RDBMS	70	30	100
MS-12	Software Engineering	70	30	100
MS-13	Computer Graphics	70	30	100
MS-14	Management Information Progamming	70	30	100
MS-15	Practical (Based on MS-11 & MS-13) (In two sittings each of 3 hrs duration)	70	30	100
Total		350	150	500

Fourth Semester

		Max Marks		Total
Paper Code	Nomenclature of Paper	External	Internal*	
MS-16:	Computer Networks	70	30	100
MS-17	Object Oriented Programming using 'C++'	70	30	100
MS-18	Internet and Web	70	30	100
MS-19	Computer Based Optimisation Methods	70	30	100
MS-20	Practical (Based on MS-17 & MS-18) (In two sittings each of 3 hrs duration)	70	30	100
Total		350	150	500

02. MASTER OF COMPUTER APPLICATIONS (MCA) - 3RD YEAR

Fifth Semester

		Max Marks		Total
Paper Code	Nomenclature of Paper	External	Internal*	
MS-31:	Data Warehousing and Data Mining	70	30	100
MS-32	C Sharp(C#)) Programming	70	30	100
MS-33	Advanced Computer Architecture	70	30	100
MS-34	High Speed Network	70	30	100
MS-35	Practical (Based on MS-32) (In one sittings of 3 hrs duration)	70	30	100
Total		350	150	500

Sixth Semester

		Max Marks		Total
Paper Code	Nomenclature of Paper	External	Internal*	
MS-41:	Thesis/Project** Distribution of marks: Thesis/Project Evaluation: 70 Viva-Voce Examination : 70 Including Seminar / Presentation / Demonstration	140	60	200
Total		140	60	200

***Internal Marks in each paper including Practicals, Project report, Training report , Thesis , Lab, Viva-voce etc. as per the following criteria:**

i) 20% Marks based on two assignments(handwritten) of 10% marks each.

ii) 10% Marks for Presentation/Viva-voce.

****Marks will be awarded on the basis of Viva-Voce examination conducted in the presence of examiners. If a candidate obtains less than total 80(at least 56 marks out of external) marks out of 200 marks irrespective of marks obtained in Thesis/Project and Viva Voce Examination, he/she will be declared fail and will be directed to work on a fresh topic. This project will be submitted not earlier than on semester duration.**

Thesis/Project Report will be submitted in triplicate (Hard Bound in green colour) alongwith CD through study centre with proper certification by the supervisor concerned who may be a person with five years working experience and must have Master's degree in relevant field or a regular teacher working in Govt/Semi-Govt. Institution/University/Engineering College. Students are advised to come prepared

for presentation/ demonstration of their Thesis/Project at the time of their final viva-voce examination.

DIRECTORATE OF DISTANCE EDUCATION

GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY , HISAR

DETAILED SYLLABUS FOR PGDCA - First & Second Semester

w.e.f. SESSION : 2006-07

[THROUGH DISTANCE EDUCATION PROGRAMME]

PGDCA - First Semester

MS-01: Introduction to Information Technology

External : 70 **Theory : 100 Marks**

Internal:30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Information concept and precessong system ; Evolution of information processing, data, information language and communication.

Elements of computer processing system ; Hardware-CPU, storage devices and media, VDU, input-output devices, data communication equipment, Software-system software, application software.

Programming Language : Classification, machine code, assembly language, higher level languages and fourth generation languages.

Operating systems : Concept as a resource manager processor, devices and memory. Concept of Priorities, projection and parallelism. Command interpreter Typical commands of DOS/UNIX/Net Ware, GUI-Windows.

Computer and Communications: Single user, multi-user, work station, client server systems, Computer networks, network protocols, LAN, WAN, Internet facilities through WWW, Mosaic, Gopher, HTML, elements of java.

Information integrity definite : Ensuring integrity, computer security, Perverse software, concepts and components of security. Preventive measures and treatment.

Range of application: Scientific, business, educational, industrial, national level weather forecasting, remote sensing, planning, multilingual applications.

Introduction to OOPS: Need of object oriented programming, Classes an objects, Data hiding, Data encapsulation, operators overloading, function overloading, inheritance and polymorphism.

References:

1. Sanders, D.H. “Computers Today”, McGraw Hill, 1998.
2. V.K. Jain “O-Level Module”
3. E.Balagurswamy, “Object Oriented Programming using C++”.

MS-02 : Computer Programming and Problem Solving.

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Introduction to algorithms, Flow-Charts, Tracing flow charts, Problem solving methods: Need for computer languages. Reading programs written in C language. C character set, Identifiers and keywords. Data types, Declarations, Expressions, statements and symbolic constants, Input-Output: getchar, putchar, scanf, printf, gets, puts, functions, Pre-processor commands, # include, ifdef, preparing and running a complete C program.

Operators and expressions: Arithmetic, Unary, Logical, bit-wise, assignments and conditional Operator, Library functions. Control statements while, do-while, for statement, nested loops, if-else, switch, break, continue and goto statements, comma operator.

Functions: Defining and accessing: Passing arguments, Functions prototypes, Recursion.

Use of library functions, Storage classes: Automatic, external and static variables, Arrays: Defining and processing, passing to a function, Multi dimensional arrays.

Strings, operations on strings.

Pointers : Declarations, Passing to a function. Operations on pointers, Pointer and arrays, Arrays of pointers.

Structure : Defining and processing. Passing to a function, Union.

Data Files : Open, close, create, process, Unformatted data files.

References :

1. E. Balaguruswamy, “Introduction to C”.
2. Kernighan, B.W., and Ritchie, D.M., “The C Programming Language” Prentice Hall of India, 1989.

MS-03 : Digital Electronics.

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note: 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Introduction: Logic Gates (AND, OR, NOT, EXOR, NAND, NOR). Boolean Algebra: Simplification by 4 Variable K-Map Method, Logic Implementation using Gates, Multiplexers, Decoders, Binary/BCD Subtraction and Addition Adder, subtractors, 7 segment LED display.

Characteristics of Digital IC’s, TTL and MOS Implementations, Representative Circuits and Comparison, Propagation delays, Fan-in/Fan-out, Tristate buffers. Flip-flops (SR, JK,D,T), Shift Registers, Counters (Synchronous and Asynchronous), Ring Counter, ROM and RAM Cells and Organizations; D/A and A/D converters.

Reference :

1. R.P. Jain., “Modern Digital Electronics”.
2. Taub and Schilling., “Digital Integrated Electronics”.

MS-04: System Analysis and Design

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Introduction:

Overview of System Analysis & Design, Business System, Concepts, system development, Testing and Evaluation.

Project Selection:

Sources of project's requests, Managing Project Review and Selection, Preliminary investigation.

Feasibility Study:

Technical and Economical Feasibility, Cost/Benefit Analysis.

System Requirements, Specification and Analysis:

Requirements determination, Fact-Finding Techniques, Data Flow Diagrams, Data Dictionary, Decision Analysis, Decision Tables and Structured English.

System Desing:

Modularization, Module Specifications, Design of Input and Control, Design of Output and Control, File/Database design, Process Design and User Interface Design.

System Engineering and Quality Assurance :

Design Objectives: Reliability and Maintenance, Software Design and Documentation tools, Managing Quality Assurance, Managing Testing Practices and Plans, Systems Controls, Audit Trails.

Merging System Implementation:

Training, Conversion and Post Implementation Review.

Reference:

1. Lee, “System Analysis and Design, Vol. I & II”, Galgotia Publications Pvt. Ltd.
2. Awadh, “System Analysis and Design”.

MS-05 : Practical (Based on MS-01 & MS-02)

External : 70 **Practical : 100 Marks**

Internal : 30

a) **IT Lab.**

Familiarising with PC, MS DOS and MS WINDOWS commands, File creation, editing and directory creation. Mastery of MS DOS commands. Learning to use of database and spread sheet, Slide creation with Power Point. Use of a visual programming language such as Visual Basic.

b) **Programming Lab.**

Programming exercises and project using C programming language. Exercises to study various features of the language. Stress to be laid on writing well-structured modular and readable programs accompanies by good documentation. Case studies of use of various data structures in applications such as sorting, searching, string manipulation and list manipulation.

PGDCA - Second Semester

MS-06 : Data Structures and Algorithms.

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Introduction to Data Structures, linear list structures (Stack, Queue, Dequeue), Circulars-linked lists, Doubly-linked lists, Multilinked lists, Trees, Binary Tree, Threaded Binary Tree, Balanced Trees, Different tree traversal Algorithms, Representation of Graphs and Applications.

Various searching and sorting algorithms and their Analysis, Internal and external sorting Techniques, Various Hashing Techniques, Dynamic Storage.

References :

1. Yedidyah Langsam, Moshe J. Avgenstein, Auromm. Tenenebaum, "Data structure using C and C++"
2. Sartaj Sahani, "Data structure using C", Galgotia Publication Pvt. Ltd.

MS-07 : Computer Organisation and Architecture.

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Principles of Computer design : Software, hardware, interaction layers in computer architecture, Central processing unit, machine language instructions, Addressing modes, instruction types, Instruction set selection, Instruction cycle and execution cycle.

Control unit, Data Path and Control Path Design, Microprogramming Vs hardwired control, RISE Vs CISE, Pipelining in CPU design, Superscalar processors.

Memory subsystem, Storage technologies, Memory array organization, Memory hierarchy, Interleaving, cache and virtual memories and architectural aids to implement these.

Input-output devices and characteristics

Input-output processing, bus interface, data transfer techniques. I/O interrupts channels, Performance evaluation-SPEC-MARKS, Transaction Processing benchmarks.

References

1. J.P Hayes, “Computer Organisation & Architecture.”
2. Mano.M. “Computer System and architecture”, (3rd edition) Prentice Hall of India, New Delhi, 1994.

MS-08: Operating System.

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Introduction :

Evolution of operating systems, operating system concepts and structure, types of operating systems.

File Systems :

File concepts, Access methods, Allocation methods, Directory systems, File protection.

CPU Scheduling :

Scheduling concepts, CPU scheduling algorithms, Algorithm evaluation, Multiple Processor Scheduling.

Memory Management:

Memory management without swapping or paging, swapping, overlapped swapping, paging, Segmentation, Virtual memeory concepts, Demand paging, Page replacement algorithms, Allocation algorithms and thrashing.

Disk scheduling :

Disk scheduling algorithms, selecting a disk scheduling algorithm, sector queeing.

System Dead Locks :

The dead lock problem, Dead lock characterization, Dead lock Prevention, Dead lock avoidance, Dead lock detection, Recovery from deadlock.

Concurrent Processes:

Mutual Exclusion, shared data, critical section, busy form of waiting, lock and unlock primitives and non-primitives, synchronization, block and wakeup.

Case Studies:

MS-DOS, MS-WINDOWS and Linux / Unix Operating Systems.

References :

1. Peterson james L and Silberscharz A., "Operating Systems Concepts", Addison-Wesley.
2. Galvin, "Operating System".

MS-09 : Business Data Processing

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Introduction to data processing : records & files; data collection, preparations, verification, editing and checking.

Business files : Master and transaction file, file generations, back-ups and file recovery procedures.

COBOL Programming : language constructs and structured program development.

File sorting, searching, merging, matching.

Reference :

1. Sten & Sten, “Cobol Programming”
2. Dastidar Ghosh, “Cobol Programming”

MS-10 : Practical (Based on MS-06 & MS-09)

External : 70 **Practical:100 Marks**

Internal : 30

a) **Data structure lab.**

1. Implementation of stack, queues as an array and linked list.
2. Implementation of linked lists with all the operations that can be performed on it.
3. Binary tree traversals, Binary Search tree, Heaps.
4. Graph & its sequential & linked representations.
5. Main sorting & Searching techniques.

At least eight exercises to be given on above-mentioned concepts.

b) **BDP Lab.**

A system for journal acquisition in a library.

A bus passenger reservation system.

An electricity billing system.

A fixed deposit accounting system for a Finance Company.

Hotel room booking.

Book issues and receipts in library.

Insurance premium calculation an issuing reminders.

A hospital management system.

DIRECTORATE OF DISTANCE EDUCATION

GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY , HISAR

DETAILED SYLLABUS FOR M.Sc. (Computer Science)

Third & Fourth Semester w.e.f. SESSION : 2006-07

[THROUGH DISTANCE EDUCATION PROGRAMME]

M.Sc. (Computer Science) - Third Semester

MS-11 : Relational Data Base Management System (RDBMS)

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Bssic Cocepts : Introduction, Database users, Data models, Schema and Instances. DBMS Architecture and Data Independence, Database languages, Data modeling using E-R Model.

Retational Model: Relational Model concepts, Relational model constrains, Update operations on relations. The relational Algebra, SQL-A Relational Database Language.

Database Design: Informal Design Guidelines for Relation Schema, Functional Dependencies, Normal Form Based on Primary Keys, Boycee-codd Normal Form. The Database Design Process.

Query Processing : Basic Algorithms for Executing query operations, Using Heuristics in Query optimisation.

Concurrency Control: Concepts, Locking Techniques for concurrency Control based on Time stamp ordering. Multiversion concurrency control Techniques.

Recovery Techniques: Recovery concepts, Recovery Based on deferred Update, Recovery Technique Based on Immediate update, Shadow Paging.

Distributed Database: Concepts, Overview of Client-server Architecture, Data Fragmentation, Replication and Allocation Techniques for Design Query, Processing in Distributed Database.

References:

1. C.J. Date, "Data Base Systems", Sixth Edition, Addison-Wesley.
2. Ramez Elmasri, Shamkant B. Nawthe, "Fundamentals of Data Base Systems", Addison-Wesley.

MS-12 : Software Engineering

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Concept of Sotware Engineering, Software characteristics, components, applications, Software Metrics and Models: Process and Product Metrics, size metric, Complexity metric (McCabe's Cyclometic Complexity), Halstead's Theory, Function Point Analysis.

Software Development: Phases, Process Models, Role of Management, Role of Metrics and Measurement, Software Quality factors.

Planning and Software Project: Cost Estimation, COCOMO, Putnam, Project Scheduling, Quality Assurance Plans, Project Monitoring Plans.

System Design: Design Objectives, Design Principles, Effective Modular Design (Functional Independence, Coupling, Cohesion), Design Tools and Techniques Prototyping, Structured Programming.

Coding: Programming Practices, Verification, Monitoring and Control.

Testing: Testing Fundamentals, Test case design, Functional Testing, Structural Testing, Test Plan, Activities during testing, Unit System, Integration Testing.

Reliability : Concept of Software Reliability, Software Repair and Availability Software Errors and Faults, Reliability Models (JM, GO, MUSA, Markov.) Limitations of Reliability Models.

Reference :

1. *K.K. Aggarwal and Yogesh Singh, "Software Engineering", New Age International Pub.*
2. Pankaj Jalota, "An Integrated Approach to Software Engineering", Narosa Pub.

MS-13 : Computer Graphics

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Overview of Computer Graphics, Interactive graphics, passive graphics, Advantages of Interactive Graphics.

Display Devices : Refresh CRT, Random-Scan and Raster-Scan Monitor, Color CRT Monitors, DVST, Plasma-Panel Displays, LED and LCD Monitors, Hard copy devices.

Scan conversion: Scan converting a point, line, circle, ellipse and arcs.

2-D graphics transformations (Rotations, Scaling, Translations, Reflecting, Shearing) Composition of 2-D transformation, 2-D viewing and clipping, Windowing concepts, clipping algorithms (Line, Area and Text) Sutherland-Cohen, Mid-point subdivision Window-to-view port transformation, Primitive and attributes, Exterior and Interior clipping.

Interactive graphics: Concept of Positioning and Pointing, Interactive Graphic Devices (Key Boards, Touch Panels, Light Pens, Graphics tablets, Joysticks, Mouse, Voice Systems) Interactive Graphical Techniques: Basic Positioning Methods, Constraints, Gride, Gravity field, Rubber-Band Methods, Sketching, Dragging, Inking and Painting.

Computer Graphic Software : Introduction, GKS (Primitive, attributes and Viewport, Display subroutines)

3-D Graphics: 3-D Graphics transformations (Rotation, Rotation about an arbitrary line Scaling, Translation), Parallel and Perspective Projections, Concepts of Hidden Line, Hidden Line and Surface elimination methods (Z-Buffers, Scan-line, Painter's, Subdivision). 3-D viewing and clipping. 3-D Object Representation: Wireframe model, Bezier Curves and Surfaces.

Multimedia: Introduction, Hardware and Software for multimedia, Applications Area for Multimedia, Components of Multimedia, Authoring Tools.

References:

1. Roy. A Plastook, Gordon Kalley; Computer Graphics (Schaum's Series) McGraw Hill.
2. Pradeep K. Bhatia , Computer Graphics, I.K. International Pvt. Ltd. 2nd Ed.

3. Newman, W, Sproul, R.F., Principles of Interactive Computer Graphics, McGraw Hill.
4. N. Krishnamurthy, “Introduction to Computer Graphics”, TMH

MS-14 : Management Information System.

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.
2. All questions carry equal marks.

Background Meaning, Nature, Need, Role, Importance, Evolution of management thorugh information system; Relation of MIS with management activities. Management functions and decision making.

Concept of balance, MIS Effectiveness and efficiency criteria.

Development of MIS: Methodology and Tools/Techniques for systematic identification, evaluation, modification of MIS.

Reference:

1. Robert G. Murdick, Jeol E. Ross, James R. Claggett, “Information system for Modern Management”.
2. James A. O’ Brien, “Management Information Systems”.
3. Banerji & Sachdeva (Vikas Publication)

MS-15 : Practical (Based on MS-11 & MS-13)

External : 70 **Practical : 100 Marks**

Internal : 30

a) <u>Computer Graphics Lab</u>

1. Draw circle using Bresenhem's Method.
2. Draw a line using Bresenhem's Method.
3. Translate and Rotate a Wheel.
4. Plot a dashed line.
5. Generate Bat Chart.
6. Rotate a circle around the circumference of an another circle.
7. Rotate a line around the circumference of a circle.
8. Generate a synchronized clock with system time.
9. Generate a fan and rotate it with proper switches.
10. Display a moving slide on screen.
11. Implement Cohn-Sutherland algorithm for line segment clipping.
12. Obtained mirror image of word "COMPUTER"
13. Perform various shearing transformations on a rectangle.
14. Write a program that applies any specified sequence of transformations to a displayed object. The program is to be designed so that a user selects the transformation sequence from displayed menu, and the composite transformation is then calculated and used to transform the object. Display the original object and transformed object.
15. Any minor project (Each student will do different problem).

b) **RDBMS Lab**

Study features of a commerical RDBMS packages such as oracle, FoxPro. Ms Access and Structures query language (SQL, use with the RDBMS Laboratory exercises should include defining scheme for applications, creation of a database, writing SQL, queries to retrieve informaton from the database. Use of host language interface with embedded SQL. Use of forms and report writer packages available with the chosen RDBMS product. Some sample application which may be programmed are given below:

Accounting for a shop

Database manager for magazine agency or newspaper agency

Ticket booking for performances

Preparing greeting and birth day cards

Personal accounts-insurance, loans, mortgage payments etc.

Doctor's diary, billing

Personal bank account

Class marks management

Hostel accounting

Video tape library

History of cricket scores

Cable transmission program manager

personal library

M.Sc (Comp.Sc) Fourth Semester

MS-16 : Computer Networks

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Concepts of data transmissio, Analog data and Analog carrier, Digital data and digital carrier etc., Half Duplex and Full Duplex Transmission Methods, Fundamental of communication theory, Shannon Hartlay Theorem, Source Encoding, Channel speed and bit rate. Bandwidth and frequency spectrum, Time Division multiple access system.

Network components, Network topology : Bus, Star, Ring, Mesh, Hybrid, Layers of OSI References Model, Character and bit protocols, Binary synchronous control (BSC), HDLC, SDLC, LANs, IEEE LAN standards, IEEE 802.5 (token rign), IEEE 802.4 (token bus) and IEEE 802.3 (Ethernet), MANs DQDB, Message, Switching, Packets switching,

X.25 protocols, Routing and Flow Control, TCP/IP Reference Model, Introduction to ATM and ISDN.

Reference :

1. Tennenbaum, A.S., "Computer Networks", Prentice Hall of India.

2. Stallings, W., "Computer Communication Networks", Prentice Hall of India.

MS-17 : Object Oriented Programming using C++

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

i) Definition: Object Oriented Programming, Paradigms and metaphors; Active Data; Message Passing; Classes; Instantiation and inheritance; Types of Object Oriented Systems.

ii) Object - Oriented Programming Tools: Development of Programming Language, Class Declarations and creating objects, Expressions and Statements; Functions; Classes; Operator Over loading; Derived Classes; File and streams, string Manipulation; Buffering.

iii) Concurrent Object-Oriented Systems.

References:

1. E. Balagurswamy, "Object Oriented Programming Using C++".

2. Lafore, "Object Oriented Programming".

MS-18 : Internet and WEB programming.

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note: 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Internet-Beginning and Current State. Hardware and Software requirement, ISP and Internet accounts. Web-Home page, URL, Browser, Security on Web, Plug-ins and Helpers. Searching tools and Search engine. FTP, Gopher, Telnet and E-mail.

Web Authoring using HTML; Creating a Web page, Methods of Lindking, Publishing HTML, Text formatting and Alignment, Font Control, Arranging text in lists, Images on a Web page, Backgrounds and Color Control, Interactive Layout with Frames.

Programming through JAVA : JAVA History, Java features, Java and Internet, Java and World Wide Web, Hardware and software requirements. Java environment, Java Program Structure. Java Tokens, Java Virtual Machine, Constants, Variables and Data Types, Operators and Expressions, Decision Making and Branching, Decision Making and looping, Classes, Objects and Methods, Interfaces Packages, Managing Errors and Exceptions.

Applet Programming: Local and remote Applets, Applets and Applications, Applet life cycle, Creating an Executable Applet, Applet tag, Passing Parameters to Apples. Brief Overview of CGI Programming.

References :

1. Kris Jamsa, “Web Programming”, Frank Bros. & Co.

2. Ned Snell, “Teach Yourself Internet”, Techmedia.

3. E. Balagurusamy, “Programming with JAVA”, Tata McGraw Hill.

MS-19 : Computer Based Optimisation Methods

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : 1. A candidate is required to attempt five questions out of eight questions.

2. All questions carry equal marks.

Operation Research : An Introduction, Linear programming, Formulation of Linear Programming Problems, Simplex methods, Duality, Software for linear programming. Network problems and shortest path in network, Discrete and continuous Markov Chains, Queuing Theory (M/M/1 and M/M/C), Integer programming.

References:

1. V.K. Kapoor, "Operational Research".
2. S.D. Sharma, "Operational Research".

MS- 20 : Practical (Based on MS-17 & MS-18)

External : 70 **Practical : 100 Marks**

Internal : 30

a) OOP lab

Practical based on C++

b) Internet and Web programming Lab

Practical based on HTML and JAVA programming.

DIRECTORATE OF DISTANCE EDUCATION

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DETAILED SYLLABUS FOR M.C.A. - Fifth and Sixth Semester

w.e.f. SESSION : 2006-07

[THROUGH DISTANCE EDUCATION PROGRAMME]

Syllabs of MCA - Vth Semester

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

MS-31 : Data Warehousing and Data Mining

Note : Examiner is requested to set 8 questions covering the whole syllabi and student is required to attempt any five questions.

Detailed Contents

Introduction : The Evolution of Data Warehousing (The Historical Context), The Data Warehouse-A Brief Hisotory, Today's Development Environment.

Principles of Data Warehousing (Architecture and Design Techniques): Types of data and their uses, Conceptual Data Architecture, Design Techniques, Introduction to the Logical Architecture.

Creating the data Asset : Business Data Warehouse Design, Populating the data Warehouse.

Unlocking the Data Asset for end users (The Use of Business Information) :

Designing Business Information Warehouse, Populating Business Information, Warehouses, User Access to Information, Information-Data in context.

Implementing the Warehouse (Managing the Project and Environment) : Obstacles to Implementation, Planning your implementation, Justifying the Warehouse, Organizational Implications of Data Warehousing, The Data Warehouse in your organization, Data Warehouse Management, looking to the future.

Data Mining

Introduction : Motivation, importance, data mining, kind of data, functionalities, interesting patterns, classifications of data minining system, major issues.

Data Warehouse of OLAP Technology for Data Mining : Data warehouse, operational database systems and data warehouses, Architecture, Implementation, development of data cube technology, Data Warehousing to data mining, Data warehousing usage.

Data Preparation : Preprocess, Data cleaning, Data integration and transformation, Data reduction, Discretization and concept hierarchy generation.

Data Mining Primitives, Languages and system architectures, graphical user interfaces.

Concept Description : Characterization and comparison, Data generalization and summarization-based characterization, Analytical characterization: analysis of attribute relevance, Mining class comparisons, Mining descriptive statistical measures in large database,

Mining Association Rules in large database, mining single-demensional Boolen association rules from transactional databases, mining multilevel association rules from transaction databases, Mining multimensional association rules from relational databases and data warehouses, from association mining to correlation analyis, Constraint-based association mining.

Classification and Prediction, Issues, Classifications by decision tree induction, Bayesian classification, classification by backpropagation, Classification based concepts from association rule mining, other classification methods.

MS-32 C SHARP (C#) PROGRAMMING

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : Examiner is requested to set 8 questions covering the whole syllabi and student is required to attempt any five questions.

Introduction

Basic Concepts, Features, Virtual Object System,. NET, Common Language Specification, Next Generation Windows Service, IL & Metadata.

C# *Types :*

Value types : Simple type, struct type, Enumeration type, Reference type-object type, class type, interfaces, delegates, string type, arrays. Boxing and unboxing conversions, Implicit, explicit, standard and user-defined conversions.

Classes & Methods

Constructors & destructors, Methods - Parameters, overriding, hiding, class properties, Indexes, Modifiers class, Member, Access, Multicast Delegates.

Control Statements :

Selection statements - if, switch. Iteration statement-for, foreach, while, do statement.

Exception Handling :

Checked & unchecked statement, compiler setting for overflow checking, programmatic overflow checking. Exception handling statement - try & catch.try and finally, try-catch-finally. Throwing exception, re-throwing exception.

Inheritance & Polymorphism

Inheritance - base class and derived class. Polymorphism, base class with a virtual method, derived class with override methods.

Interfaces :

Interfaces - Base interface, interface body, interface members, interface methods, interface properties, interface envents, interface indexers, interface mapping, interface reimplementation.

Configuration & Deployment

Conditional compilation - Proprocessor usage, the conditional attribute. Documentation comments in XML - Describing an element, adding remarks and lists, examples, describing parameters, describing properties, documentation compiling NGWS components.

Security

Code Access Security, Verification of type security, permissions, Standard permissions, dentity permissions, Role based security.

Reference

i) Christoph Wille, Presenting C# -- SAMS Techmedia.

ii) C# Made Simple - BPB Publicatiob

iii) Vijay Mukhi, C# The Basics, --BPB Publications

iv) Vijay Mukhi, C#, Nuts & Bolts -- BPB.

MS-33 Advanced Computer Architecture

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : Examiner is requested to set eight questions covering the whole syllabi and student is required to attempt any five questions.

Introduction :

Evolution, performance attributes, Flynn's classification, multiprocessor, multicomputer, scalable, superscalar, multireading, pipelining, superpipelining dataflow architecture.

System Network & Scalable Properties :

Data & Resource dependencies, program partitioning and scheduling, System interconnect architecture - crossbar, multiport, multistage networks, Scalability analysis and approaches.

Pipelining :

Pipelining - Linear, non-linear pipelining, design of instruction and arithmetic pipeline Superscalar and Superpipeline design. Pipelining is RISC, CISC, CRISC & VLIW architecture.

Cache Memory Organization :

Cache addressing modes - physical, virtual, unified vs. Split cache, Mapping - Direct Associative, set- associative, Sector mapping cache. Performance issues. Page replacement policies. Cache coherence problem, Snoopy bus protocol-write back vs. write through. Directory based protocol.

Multithreaded & Dataflow Architecture

Multithreadings, multiple context processors, multimensional architecture, dataflow architecture - dataflow graph, static & dynamic dataflow computers.

Concurrent Processors :

Vector Processors - functional units, vector instruction, processor implementation, speedup.

Vector memory - modeling vector memory performance, Gamma

(1) Binomial model.

Multiple issue processors, Multivector multiprocessors.

References :

i) Kai Hwang - Advanced Computer Architecture, Parallelism, Scalablility, Programmability - MGH

ii) Micheal J. Flynm - Computer Architecture, Pipelined & Parallel Processor Design - Narosa.

iii) J.P. Haycs - Computer Architecture & Organization - MGM.

MS-34 : High Speed Networks

External : 70 **Theory : 100 Marks**

Internal : 30 **Time : 3 hours**

Note : Examiner is requested to set eight questions covering the whole syllabi and student is required to attempt any five questions.

Need of a high speed network, performance attributes, network backbone, cost of high speed networks, Fiber Distributed Data Interface (FDDI), Fast Ethernet-IEEE 802. 3u, Gigabit Ethernet - RSVP, Virtual LANs, Video Compression, Fiber Channel - layer 0, Layer 1, Layer 2, Layer 3, Layer 4, Protocol mapping. ISO Ethenet 802.9a.

Integrated Services Digital Network (ISDN), Switched Multimegabit Data Services (SMDS), Frame Relay Networks. Asynchronous Transmission Mode (ATM) - Reference model, ATM Switches, ATM in datalink Network and Transport Layer.

Digital Subscriber Line Services & Cable Modems - DSL (Digital Subscriber Line), ADSL (Asymmetic Digital Subscriber Line), HDSL (High bit rate digital subscriber line), VDSL (Very High bit rate Digital Subscriber Line), SDSL (Symmetrical Digital Subscriber Line), RADSL (Rate Adaptive Digital Subcriber Line).

Management System for High Speed Network - Traffic Management, Application Management, Device Management, Management platforms.

Reference :

i) Tere Parnell - Building High Speed Networks, -- TMH

ii) Cooper E. - Broadband Network Technology -- Prentice Hall

iii) Tanenbaum - Computer Networks -- PHL

iv) Green P.E. - Fiber Optics Networks - Prentice Hall.

v) Goralski W.J. -- Introduction to ATM Networking -- MGH.

Syllabs of MCA - Vth Semester

			External	internal
MS-41:	Thesis/Project**	200	140	60
	Distribution of Marks Thesis/Project Evaluation:	100	70	30
	Viva-Voce Examination including Seminar/Presentation/Demonstration	100	70	30

**Marks will be awarded on the basis of Viva-Voce examination conducted in the presence of examiners. If a candidate obtains less than total 80 marks out of 200 marks irrespective of marks obtained in Thesis/Project and Viva Voce Examination, he/she will be declared fail and will be directed to work on a fresh topic. This project will be submitted not earlier than on semester duration.

Thesis/Project Report will be submitted in triplicate (Hard Bound in green colour) alongwith CD through study centre with proper certification by the supervisor concerned who may be a person with five years working experience and must have Master's degree in relevant field or a regular teacher working in Govt/Semi-Govt. Institution/University/Engineering College. Students are advised to come prepared for

presentation/ demonstration of their Thesis/Project at the time of their final viva-voce examination.