

# MASTER OF COMPUTER APPLICATIONS

## SCHEME

### SEMESTER III

NO	Subject	No.of Periods per week		Duration of exam in hours	Max. Marks		Total Marks
		Lecture	Lab		Sessional	Uty. Exam	
MCA301	Principles of Management	4	--	3	25	75	100
MCA302	Computer Graphics	4	--	3	25	75	100
MCA303	Data Base Management System	4	--	3	25	75	100
MCA304	System Software	4	--	3	25	75	100
MCA305	Object Oriented Programming and C++	4	--	3	25	75	100
MCA306	Software Lab-3(Data Structures, Computer Graphics & C++ Programming)	--	6	--	100	--	100
	<b>Total</b>	20	6	--	225	375	600

1 Period is 1hour duration

## SYLLABUS

## MCA - 301 PRINCIPLES OF MANAGEMENT

### General Management:

**Introduction :** Significance and definition of Management- Administration vs Management –functions of management –Planning, Organizing, Staffing, Directing and Controlling- Levels of Management skills- motivation, Communication, Decision making.

**Forms of business organization:** Sole ownership, Joint Stock Company. Advantages, Limitations and salient features of each. Cooperatives. Private and public companies- government companies.

**Organisation;** Basic principles of organization-responsibility and authority, delegation and control-co-ordination. Span of control, Management structure-forms of organizational structure-Line, line and staff and functional relationships. Use of committees.

### MANAGEMENT THEORIES:

Henri Fayol's principles of management: Taylor's Scientific management –Max Weber's theory of bureaucracy- Human relations approach –Hawthorns studies. Behavioral sciences and quantitative approaches.

Network Management techniques: Planning and scheduling of networks-Bar charts-milestone charts-AON diagram-PERT and CPM-Drawing of networks-Critical path-Crashing-Resource allocation-Simple problem.

## PERSONNEL MANAGEMENT

**Objectives**-functions of personnel management-personnel policies-Advantages. Manpower planning-benefits, problems, and limitations, Manpower forecasting.

**Recruitment**:-sources –selection procedure-various stages-different types of employment tests –interviewing techniques-placement, transfers and promotions –exit interview.

**Training and Development**:-types of training-methods of training-Management development-On and Off-the-job training-Performance appraisal.

**Marketing Management**:-Sales vs marketing-Functions of marketing-market research-Sales promotion-Advertising.

**Financial Management**: Objectives-Financial planning-Functions of financial managers-sources of industrial finance.

### References:

- 1.Koontz and O'Donnel-Essential's of management-Mc Graw Hill.
- 2.T.N.Chhabra-Principles and Practice of Management-Dhanpat Rai.
- 3.Jerome D Weist & Ferdinand K Levy-a Management Guide to PERT and CPM – prentice Hall of India.
- 4.Massie Joseph L-Essentials of Management-Prentic Hall of India.
- 5.Singh B.P and Chhabra T.N.Personnel Management and Industrial Relations-Dhanapat Rai.

## **MCA - 302 COMPUTER GRAPHICS**

**Display Devices:** Refresh CRT's ,Raster scan displays, Random scan displays, Direct view storage tubes, Three-dimensional viewing devices, Digital frame buffer, Plasma panel displays, Color display techniques, Stereoscopic and virtual-reality systems, Raster scan systems-video controller, Raster scan display processor.

**Interactive Graphics:** Pointing and positioning devices-Keybaord, Mouse, Digitizers, Light pen pointing and Positioning techniques.

**2D Graphics:** Line drawing techniques, Circle generation, Curve generation, Filling algorithms, Shading, Transformations.

**Windowing and Clipping:** Windowing concepts, Clipping algorithm-line clipping, area clipping, text clipping blanking, Window-viewport transformation.

**3Dgraphics:** Object Representation, Projection, Transformation, Hidden line removal algorithm, Depth-Buffer method, back-Face detection Scan line method, Area Subdivision method.

**Curves and Surfaces:** Shape Description, Bezier methods, B-spline methods, Octrees, Fractals.

### **Text Book:**

1. Computer Graphics-Hearn & Baker(Prentice Hall)]2<sup>nd</sup> Edition.

### **References:**

1. Principles of interactive computer graphics- Newmann.s.sproull (Mc-Graw hill)
2. Computer Graphics-Harrington(Prentice hall)
3. Computer Graphics- Plastock and kalley( Schaum's series-Mc Graw Hill)
4. Computer Graphics Principles and practice-Foley and others,Adison Wesley.

## **MCA 303 DATA BASE MANAGEMENT SYSTEM**

Data base System: An overview, Data models, Network, Hierarchical, Relation model.

The Relational model:- Structure of relational database, Relational Algebra and calculus,  
Modifying the database, Comparison of models, Relational query languages, Query processor,  
Data manipulation with SQL.

Relational database design:-Functional dependencies, Decomposition of relational Schemes, Normal forms for relational schemes, Multivalued dependencies.

Protection of the database:-Integrity, Integrity constraints, Security, Security in statistical database.

Concurrent operation on the database:-Basic concepts, Live lock and Dead lock, Read and Write lock model,  
Read-only and write-only model, protecting against crashes.

Distributed database systems:-Fragments of Relations, Distributed concurrency control, Management Of deadlocks and crashes.

**Text Books:**

- 1.An introduction to Database systems,Vol.1 & 2,C.J.Date-Adison Wesley.
- 2.Principles of Database systems-Jeffery.D.Ullman,Galgotia publication Pvt Ltd.

**References:**

- 1.Database system concepts-Henry.F.korth,(Mc Graw Hill)
- 2.Database design Fundamentals-Roshe,Prentice hall.

**GENERAL CONCEPTS:** Distinction between system software and application software.

Review of m/c and assembly language programming. Assembly language statements- Imperative, declaration and assembler directives.

**Assemblers:-** Two pass and one pass assemblers.

**Macros:-** Macro definition, macro call, macro expansion, nested macro calls, macro processors. Editors and Debuggers.

**Linkers and Loaders:-** Linker:- translated, linked and load time addresses. Relocation and linking concepts. Object module, Loader- absolute loader, Relocating loader.

**Compiler:-** The phases of a compiler. Passes and reducing the number of passes. High level programming languages- definition of programming language- Syntax, semantics, the hierarchy of program elements. The lexical and syntactic structure of a language. Data Elements- Identifiers and names, attributes, declarations, binding attributes, to names. Data structures, arrays, record structures. Operators-Arithmetic- relational and logical, associativity and precedence, algebraic properties of operators, other operators. Assignment- 'l' and 'r' values, implementation of assignment. Statements- simple and compound statements, types of statements.

**Lexical Analysis:-** The role of the lexical analyzer , a simple approach to the lexical analysis- transition diagram.

The syntactic specification of a programming language- Context free grammar derivations and parse tree, unambiguous grammar. Basic parsing techniques- bottom-up and top-down parses, representation of a parse tree, shift reduce parsing. Stack implementation of shift reduce parsing, Constructing a parse tree.

Intermediate code generation- postfix notation, syntax tree, Three address code, Intermediate code optimization- local optimization, loop optimization- loop variant computation, induction variable elimination. Reduction in strength.

**Code generation:-** object program, Run time addresses for names, problems in code generation, simple code generator.

***Textbooks:***

1. System programming and Operating Systems-D.M.Dhamdhare, Tata Mc Graw Hill.
2. Principles of Compiler Design- Aho and Ullman, Narose Publishing House.

***References:***

1. Introduction to Computer Systems- Mac Ewen, Mc Graw Hill.

2. Systems Programming- John J Donovan, McGraw Hill

**MCA 305 OBJECT ORIENTED PROGRAMMING AND C++**

(The course to be handled in c++)

Introduction to object oriented concepts:- Overview of object oriented system- Abstract Data Types, Inheritance, Polymorphism, object identity, object modeling concepts, object oriented design, Object Oriented Programming languages, object oriented Database, object oriented user interface.

**Abstract Data Types:-** Data types, Abstract Data Types, Object message paradigm, Modularization classes , Overloading, Dynamic Binding ,parametric polymorphism, constraints.

**Inheritance:-** Inheritance in knowledge- Oriented Representation inheritance in object oriented languages, Different facets of inheritance, inheritance and sub typing, class inheritance, Inheriting Instance variables, Inheriting Method Metaclasses, Object Inheritance, multiple inheritance.

Overview of other object oriented programming languages. SMALL TALK, ADA, EIFFEL.

Object Oriented Analysis and Design- Object oriented analysis, System Design Object Design, Semantic and Entity, Relationship and modeling overview of existing methodologies, Booch's OOA and OOD approach- Semantic and Entity Relationship modeling, contrasting Design for Databases and OOA/OOD, double Design. Overview of existing methodologies – Booch's OOA and OOD approach, The OMTOOA and OOD approach, Shdaer and Mellor OOA and OOD Method.

System and Application: OODBMS, OOGUI, object oriented application.

**Text Books:**

1. Object Oriented Modeling and Designing, James Ramburg and other, PHI
2. The C++ Programming Language, Bjarne strousstrp, Addison Wesley.
3. Object Oriented Programming with C++, E.Balaguruswamy, Tata Mc-Graw Hill

**References:**

1. A C++ Primer, Stanley. B.Hippman, Adison –Weseley, 1993.
- 2.Data Abstractions and OOP in C++.

