Tilak Maharashtra Vidyapeeth, Pune

Department Of Computer Science

Syllabus of Master Of Computer Management (MCA)

SEMESTER – I
Subject: C Programming (MCA – 131)

1. LOGIC DEVELOPMENT:

Variable & Constants, Operators, Programming Constructs, Sequence, Selection Iteration.

2. INTRODUCTION TO FLOWCHARTING:

What Are Flowcharts? Types of Flowcharts, Advantages of Flowcharts, Flowchart Symbols, Use Of Symbols, Developing Flowcharts, Flowchart Aesthetics.

3. TECHNIQUES:

Flowchart For Computations, Flowcharts For Decision Making, And Flowcharts For Loops Predefined Process, Arrays.

4. INTRODUCTION TO C

DATA TYPES AND OPERATORS:

Instruction in C, Operators, Type Conversions, Operator precedence in C, Data Types Revisited

INPUT / OUTPUT:

Introduction, Unformatted I/O Functions, Formatted I/O Functions.

5. CONTROL STATEMENTS:

Decision Control Instruction, Loop control or Iteration instructions, Case Control Instructions, Jump Statements.

6. FUNCTIONS:

What is a Function? Why use Functions? Passing Value between Functions, Scope Rule of Functions, Advanced features of Functions.

7. STORAGE CLASSES:

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

8. ARRAYS AND STRINGS:

Introduction, One Dimensional Array, Two Dimensional Arrays, Strings, String Library Functions, Two Dimensional Arrays of Characters.

9. POINTERS:

Pointers Overview, Pointers and Functions, Pointers and Arrays, Dynamic Memory Allocation, Pointers to Pointers.

10. STRUCTURES AND UNIONS:

Introduction, Declaring a Structure and Union, Array of Structure, Assigning a Structure variable to another variable, Nesting of Structure, Passing a Structure variable to a Function, Pointers and Structures, User defined Data Types.

11. FILE MANIPUALATION:

Introduction, Unformatted High level Disk Input Output functions, Character Input output in Files, Command Line Arguments, String Input Output in Files, Formatted High level Dist I/O Functions, Direct Input Output, Error Handling functions, File Positioning, Introduction to Preprocessor, Macro substitution, File Inclusion.

Reference Books:

The spirit of C - Mulish Cooper

Programming in ANSI C - Balguru swami

Let us C - Yashwant Kanitkar

Data Structure Using C – Tenenbaum

Subject: Mathematics & statistics (MCA – 132)

Part I. Mathematics

1. MATHEMATICAL LOIGIC AND TRUTH TABLE

Truth table, Venn diagram, Statement OR Proposition, logical connectives

2. SET THEORY

Set concept, Subset, Union and Intersection, Complement of a Set, Universal set and De Morgan's Law

3. FUNCTIONS

Number System, Preliminary Concepts, All types of Functions and Relations

4. BIONOMIAL THEOREM

Polynomial, Pascal triangle, Properties of Binomial Expansion, Middle term Expansion

5. LINEAR EQUATIONS

Determinants, Matrices, Types of matrices Linear Homogeneous and Linear non-homogeneous equations

6. QUADRATIC EQUATIONS

Formation of equations, Roles nature of roots of quadratic, equation, complex, numbers

7. PERMUTATIONS AND COMBINATIONS

Fundamental principles, permutations, combinations, Simple Relations, numerical problems

8. PROBABILITY

Theorems, Probability, Conditional Probability, Events and Probability Model

9. SEQUENCES, SERIES AND PROGRESSION

Arithmetic progression, geometric progression, numeric progression, Means numerical problems, Arithmetic, geometric, finite and infinite series

10. BINAR SYSTEMS

Decimal System, Binary system, OCTAL system, HEXADECINAL system, Binary arithmetic, Conversions

11. VECTORS AND SCALARS

Vectors concept – unit vector – Null vector – Equality vector – Properties of addition of vectors – Multiplication of vector by a scalar

12. LINER PROGRAMING PROBLEMS

Meaning LPP, Mathematical formulation of LPP, Solution of LPP by graphical Method, Graphs of Linear inequalities

Part II. Statistics

1. INTRODUCTION STATISTICS

Importance of statistics, scope of statistics in industry Economics, social sciences, management's sciences

2. STATISTICAL DATA

Types, variable, raw data attributes primary and secondary data, Graphical representation of data, histogram, frequency, polygon, Ogive curves, and diagrammatic representation of data. Simple bar diagram, subdivided bar diagram, pie diagram.

3. MEASURES OF CENTRAL TENDENCY

Concepts of central tendency of data, arithmetic mean, median, mode, Effects of change of origin scale on mean, numerical problems.

4. MEASURES OF DISPERSION

Measures of dispersion absolute and relative measure of depression, Range, mean, variance, standard deviation coefficient of variation. Numerical problems.

5. SKEWNESS, KURTOSIS and MOMENTS

6. **CORRELATION**

Correlation concept, Covariance, Coefficient of Correlation and Numerical problems

7. LINEAR REGRESSION

Line regression, Equation of line regression by the method of least squares

8. INDEX NUMBERS

Price and quantity index numbers, Laspeyre's, Paasche's and Fisher's properties and Numerical problems

Reference Books:

1) Mathematics and Statistics - M. L. Vaidya, M. K. Kelkar

2) Statistical Analysis - A Computer Oriented Approach

3) Introduction to Mathematical Statistics

4) Introduction to calculus of finite differences - Richardson C.

Subject: Operating System (MCA – 133)

1. I/O PROGRAMMING

INTERRUPT PROGRAMMING, MACHINE STRUCTURE:

Machine Structure, Assembly Language Programming, I/O programming, Interrupt Structure and Processing, Examples of I/O and Interrupt Processing Programs.

2. PROCESSOR MANAGEMENT:

State Model, Job Scheduling, Process Scheduling, Multiprocessor Systems, Process Synchronization.

3. DEVICE MANAGEMENT:

Techniques for Device Management, Device Characteristics – Hardware Consideration, Channels and Control Units, Device Allocation Considerations, Virtual Devices, I/O Programming, Interrupt Structure and Processing.

4. MEMORY MANAGEMENT:

Single Contiguous Allocation, Introduction to Multiprogramming, Partitioned Allocation, Relocation Partitioned Memory Management, Paged Memory Management, Demand – Paged Memory Management, Segmented Memory Management, Segmented and Demand – Paged Memory Management, Other Memory Management, Future Trends in Memory Management.

5. INFORMATION MANAGEMENT:

A Simple File System, General Model of a file System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File System, Device Strategy Module.

6. DESIGN OF A SAMPLE OPERATING SYSTEM:

Overview of the System, Design Overview, Levels and Layers of the Sample Operating System, Nucleus Databases and Routines, Processor Management Databases and Routines, Memory Management Databases, Device Management Databases, Device Management Routines and Processes, Supervisor Routine and Process, User Programs and Processes, Partial Trace of SVC Flow.

7. INTERDEPENDENCIES: PERFOMANCE EVALUATION

Memory Management, Processor Management, Device Management, Information Management, Influences, Swapping versus Paging, Thrashing.

Reference Books:

1) Operating System Concepts- Abraham Silberschatz

2) Operating Systems : Design and Implementation - Andrew S. Tanenbaum

3) Operating System Concepts : Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne

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Subject: Database Management System (MCA-134)

1. File Organization

a) Storage devices characteristics

b) File Organization

• Sequential Files

• Indexing and methods of indexing

• Hash files

2. Introduction to Database Systems

a) Advantages and drawbacks of DBMS

b) Components of DBMS

c) Types of DBMS

☐ Hierarchical

☐ Network

☐ Relational

d) Why RDBMS?

e) Features of RDBMS

f) Attributes, tupples & tables

3. ER Model

a) Entity, Relationship

b) Types of relationships

c) Weak and strong entity

d) Conventions for drawing ERD

e) Generalization

f) Abstractions

4. DBMS Concepts

ACID Property, Concurrency control, Recovery mechanisms, Views & Security,

Integrity constraints, views management, data security

5. Relational Database Design

a) Need for proper database, undesirable properties of bad database design

b) Functional dependencies

c) Normalization using FDS

• 1 NF

• 2 NF

• 3 NF

• BCNF

d) Properties of decomposition

e) Loss less join

f) Dependency preserving

6. SQL Relational Database Language

a) DDL, DML, DCL

b) Simple queries

7. Security

a) Granting access to users

b) Extending and-restricting privileges.

c) Using views of security

8. Transaction processing

a) Properties of tractions

b) Schedules

c) Serializing and its need

9. Backup & Recovery

a) Types of failure

b) Need for Backup & Recovery

c) Methods of Backup

10. Concurrency Control & Recovery Techniques

a) Locking methods binary lock, shared & exclusive lock 2PL

b) Deadlocks

c) Deadlocks handling detection & prevention

d) Time stamping methods wait die- & wait-wound

11. Introduction to Data Warehousing & Data Mining

Reference Books:

1) Database System Concepts, Silberschatz, Korth and Sudershan, McGraw Hill

2) Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, 2002

3) Relational Database Index Design and the Optimizers by Tapio Lahdenm¨aki Michael

a. Leach, John Wiley

4) PostgreSQL, Sams Publications

5) Principles of Database Systems Vol. I & Vol II, J. D. Ullman, Rockville, MD: Computer Science Press, 1998

Subject : Enterprise Resource planning(MCA -135)

1. INTRODUCTION:

a) ERP : An Overview

b) Enterprise – an overview,

c) Benefits of ERP,

d) ERP and Related Technologies

e) Business Process Reengineering (BPR)

f) Data Warehousing, Data Mining

g) On- line Analytical Processing (OLAP)

h) Supply Chain Management.

2. ERP IMPLEMENTATION:

a) ERP Implementation lifecycle

b) Implementation Methodology

c) ERP implementation – The hidden cost

d) Organizing the Implementation

e) Vendors, Consultants and Users

f) Contracts with Vendors

g) Consultants and Employees

h) Project Management and Monitoring

i) After ERP implementation.

3. THE BUSINESS MODULES:

a) Business Modules in an ERP packages

b) Finance, Manufacturing,

c) Human Resource

d) Plant Maintenance

e) Materials Management

f) Quality Management

g) Sales and Distribution.

4. ERP – PRESENT AND FAILURE

a) Turbo Charge the ERP System

b) Enterprise Integration

c) Application (EIA),

d) ERP and E- Commerce

e) ERP and Internet,

f) Future Directions in ERP.

Reference Books :

1) Enterprise Resource Planning(ERP) : Alex Leon(Tata Mc. Graw Hill)

Subject : Practical C programming(MCA – 137)