# Tilak Maharashtra Vidyapeeth, Pune

## Department Of Computer Science

## Syllabus of Master Of Computer Management (MCA)

### SEMESTER – II

### Subject: MCA-231 Data Mining & Data Warehousing

**1. Introduction to Data Mining**

• Definition

• Data Mining Tasks

- Classification

- Regression

- Change and Deviation Detection

- Clustering

- Summarization

- Dependency Model

• DM versus Knowledge Discovery in Databases

• Data Mining Issues

- Mining Methodology and User Interaction Issues

- Performance Issues

- Diversity of Database Types

• Data Mining Metrics

• Application of Data Mining

**2. Introduction to Data Warehousing**

• Introduction

• Architecture of Data Warehousing

• OLAP and Data Cubes

• Dimensional Data Modeling

• Data Preprocessing

• Machine Learning

• Pattern Matching

**3. Data Mining Techniques**

- Association Rule Mining Market Basket analysis

- Frequent item-sets and Association rule mining

- Apriori algorithm,

- FP growth algorithm,

- sampling Algorithm

4. **Classification & Prediction**

- Definition of classification

- Model construction

- Model Usage

- choosing algorithm

- Decision tree learning

- Information gain, gain ratio, gini index

- Bayesian Classification,

- Bayes Theorem

- Naïve Bayes classifier,

- Measuring performance of classifiers,

- Prediction Linear Regression, Non-linear Regression, Logistic Regression

**5. Clustering**

- Basic issues in clustering

- First conceptual clustering system: Cluster/2

- Partitioning methods: k-means, expectation maximization (EM)

- Hierarchical methods: distance-based agglomerative and divisible clustering

- Conceptual clustering: Cobweb

**6. Data Mining Tool**

- Weka

- R

- Sample Application of Data Mining

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## Subject: MCA-232 C++ Object oriented Programming

**1. Introduction to Object Oriented programming, Characteristics**

Advantages of object Oriented programming over procedural.

**2. Introduction to C++, Extension of C**

New, delete operator, Data types, constants, references, Variable, Inline functions, default parameters, Static members.

**3. Introduction to C++ Classes**

Members data, Functions, Scope resolution operator, Encapsulation, Access specifier, Constructor, destructor, copy constructor, This pointer.

**4. Overloading**

Function Overloading, Operator Overloading, and Canonical form.

**5. Inheritance**

Base class, derived class, Constructor / destructor calling sequences, Access specifier in sequence, Virtual Class, Abstract class.

**6. Polymorphism Stream Class, File Input/output**

**7. Exception Handling.**


## Subject: Data Structures (MCA-233)

**1. Advanced Concepts of C**

Introduction, Data type, arrays, multi-dimensional arrays, pointers, advantages & disadvantages of pointers, pointer arithmetic, array of pointers, functions, storage classes, dynamic allocation and de-allocation of memory, structures, unions

**2. Introduction to Data Structure**

Introduction, Data objects, Data Types, Data Structures, primitive and non-primitive data structures, Implementation of the data structures

**3. Array**

Array as Data Structure, storage representation of arrays, two dimensional and multidimensional arrays, applications of arrays

**4. Linked List**

Introduction, drawback of sequential storage, concept of linked list, singly linked list, operation of linked list, doubly linked list and operations, circular linked list and operation, Difference between an array and linked list**.**

## 5. Stack

Introduction, Definition, Operation on stack, Implementation of stack, Application of stackrecursion, infix, prefix, postfix expressions.

## 6. Queue

Introduction, Definition of a Queue, operation on a queue, static and dynamic implementation of Queue, types of Queue-circular and priority Queue

## 7. Tree

Introduction, tree terminology, rooted tree, binary tree, binary tree representation, binary search tree – creating a BST.

## 8. Graph

Introduction, Graph representation, Applications of graph**.**

**Reference Books:**

**1. C & Data Structure Balagurusamy**

**2. Data structure and program design in C R.L.Kruse**

**3. Data structure through C Y.P.Kanetkar**

**4. Data structure through C in depth Shrivastava**

**5. Data structure Seymour Liptsuz**

**6. Data structure Tannebaum**


## Subject: Numerical Methods & Graph Theory(MCA-234)

**1-Solutions to algebraic and transcendental Equations**

- Bisection method

- Secant method

- Regula falsi method

- Newton Raphson method

- Iterative / successive approximation method

- Compaciasion of Iterative method

**2-System of linear equations**

- Gauss elimination method

- Gauss gaudan elimination method

- Triangular rotation method (L U M )

- Ill condition system

- Comparison and choice of method

**3-Interpolation & Polynomial approximation**

- Finite Difference operator

- Forward & Backward differences

- Interpolation techniques based on finite differences

- Newton's forward difference interpolation method

- Newton's backward interpolation method

- -Error in polynomial interpolations

- Langranjase Interpolation

- Spline Interpolation

- List square approximation

**4-Numerical integration**

- Trapezoidal rule

- Simpsons 1/3 rd rule

- Samson's 3/8 th rule

- Error in Integration formula

**5-Solutions to Ordinary differential equations**

- Taylor series method

- Velars method

- Runge Kutta method

- Predictor corrector formula

**6-Errors in Numerical computahens**

• Floating point numbers

• Types of Errors

• Analysis & Estimation of Errors

• Error propagation

**7-Introduction to Graphs**

• Graphs

• Parallel edge

• Types of Graphs

• Operation on graphs

• Tree

## Subject : Principles & Practices of Management (MCA-235 )

**1. Nature of management :**

a. Meaning , Definition

b. Nature of mgmt.

c. Importance of mgmt.

d. Functions of mgmt.

e. Management as an art , a science and a profession

f. Distinguish between management, organization and administration

**2. Evolution of Mgmt. thought :**

a. Contribution of F.W.Taylor

b. Contribution of Henry Fayol

c. Contribution of Elten Mayo

d. Various approaches to management

**3. Planning :**

a. Meaning, definitions

b. Nature , objectives

c. Importance

d. Process of planning

e. Types of plans

f. Advantages

g. Disadvantages

**4. Forecasting:**

a. Meaning

b. Methods

c. Techniques

d. Sales forecasting:

e. advantages

**5. Decision making:**

a. Meaning and definitions

b. Types of decisions

c. Process of decision making

**6. Organizing:**

a. Meaning and definitions

b. Importance of organizing

c. Features of organizational structure

d. Types of organization:

- Line

- Line and staff

- Functional

- Committee

e. Departmentalization

f. Span of management

g. Delegation of authority

h. Centralization and decentralization

**7. Staffing:**

a. Meaning , definitions

b. Importance

c. Recruitment and selection

d. Training and development

e. Performance appraisal

**8. Directing:**

a. Meaning , definitions

b. Principles of directing

**9. Communication:**

a. Meaning and definitions

b. Elements

c. Process

d. Importance

e. Types

f. Principles

**10. Motivation:**

a. Meaning and definitions

b. Objectives

c. Theories of motivation

• Maslow's theory of hierarchy of needs

• Herzberg's two factor theory

• McClelland's theory

• Expectancy theory

• Equity theory

• Reinforcement theory

d. Special motivational techniques

**11. Leadership:**

a. Meaning and definitions

b. Features

c. Importance

d. Theories

• Great man

- Trait

- Situational

- Behavioral

- Followers

- Managerial grid

- Path goal

e. Styles of leadership

- Autocratic

- Participative

- Laissez faire

f. Qualities of a leader

**12. Controlling :**

a. Meaning and definitions

b. Features

c. Control process

d. Control techniques

a. Traditional

b. Modern

13. **Recent trends in management:**

Social responsibility of mgmt

a. Stress mgmt

b. Total quality mgmt.

c. Disaster mgmt.

d. Event mgmt.

e. M.B.O. (management by objectives)

### MCA-237 LAB – C++ And DS - Mini Project