

॥ अंतरी पेटवु ज्ञानज्योत ॥



**NORTH MAHARASHTRA UNIVERSITY,  
JALGAON**

**Revised Syllabus for**

**MASTER DEGREE IN  
COMPUTER MANAGEMENT**

**(M.C.M.)**

**(SEMESTER I & II)**

**(w.e.f. July, 2001)**

MCM Course Structure

- Sem . I . 1.1. Elements of Information Technology  
1.2. Visual FoxPro 6.0  
1.3. Object oriented programming Using C++  
1.4. Internet Fundamentals and Web Tools  
1.5. Software Engineering  
1.6. Practicals
- Sem. II 2.1. Linux  
2.2. Accounting Information System  
2.3. Data Structure using C++  
2.4 Oracle and D2K  
2.5. LAB based on 2.1 and 2.3  
2.6. LAB based on 2.2 and 2.4
- Sem .III 3.1. Database Management Systems  
3.2 Business Application  
3.3. Essentials of ERP, ECRM  
3.4. Quantitative Techniques  
3.5. Visual Basic  
3.6. LAB on 3.1 and 3.5
- Sem .IV 4.1. Management Information System  
4.2. Essentials of E-commerce  
4.3. SQL server  
4.4 Programming in Java  
4.5. Project & Viva Voce  
4.6. LAB based on 4.3 and 4.4

Paper : 1.1 Elements of Information Technology

Computer fundamentals: Definition of computer, characteristics of computer, types of computer ( Analog, Digital, Hybrid ), Block diagram of computer.

Peripheral devices : Input devices - Key board, mouse, Output devices - Console, printers (dot matrix, line, ink-jet, laser ), Secondary storage devices - Magnetic tape, Floppy disk, CD-ROM.

Data Representation : Decimal number, binary number, conversion of decimal to binary number and vice-versa, EBCDIC code, ASCII code.

Computer languages : Machine language, assembly language, high level language, object oriented language, language processor.

Introduction to microprocessors : 8085/8086 microprocessors architecture.

Operating system : Definition of an operating system, functions of an operating system, types ( DOS, WINDOWS 98, WINDOWS NT, UNIX/LINUX ).

Study of DOS commands : Internal and External

Programming fundamentals : Algorithm, flowchart, concept of program.

Data processing techniques : Concepts of file, record, field, data, information.,

File organizations - Sequential, index sequential, random, direct, relative.

File handling functions - Insertion, deletion, sorting, merging, indexing, updating.

Concepts of networking : Introduction to computer network, essentials of computer network, type of network ( LAN, MAN, WAN, INTERNET)

Data communication : Concepts of communication, means of communication, types of communication, OSI-7 layers, topologies, protocols, TCP/IP.

Introduction to virus and vaccines : virus fundamentals, types of viruses, effects of viruses, available vaccines.

**References :**

Fundamental of computers : V. Rajaraman,

Principle of Digital Electronics : Malvino, Leach

Information Technology (O Level) : V. K. Jain

Computer and Commonsense : Hunt, Shalley

Teach yourself - The Internet in 24 hours : Techmedia

Basic : Introduction to the project manager and Visual FoxPro Designers, Using Toolbars and Wizards.

Overview of Visual Foxpro's Facilities: Exploring a Database, Creating a New Table, Query, Report Create a one-to-many forms, Add controls from a class Library, Add a control with a Builder

Creating tables : Storing and Viewing information in Tables, Customizing Tables.

Organizing data using Indexes: Concept of Indexes, Creating an Index, Using Indexes.

Collecting Tables into a Database: Working with a database, creating a new database, Setting field properties, using referential integrity.

Querying Data : Designing a query, Selecting fields for the Query Selecting the records as desired, Ordering query results, Grouping query results, Directing the results of a query, running a query, customizing queries.

Updating data with views: Creating views, viewing and updating remote data, customizing views.

Querying and updating multiple Tables : Querying multiple tables and views, Using Multiple tables in views, using multiple remote tables in a view, combining local and remote data in a view.

Designing Reports and Labels : Designing reports, creating a report layout, creating mailing label layout, modifying layout, customizing layout, previewing and printing a report or label.

Displaying data in Forms : Creating forms, modifying a form, Adding controls to a form, customizing forms, saving forms, running a form.

Importing and Exporting Data : Importing Data, appending data, exporting data: Sharing Data.

Sharing Information with other applications : Copying and pasting data, creating mail merges, linking or embedding data.

Reference Books: Microsoft Visual foxpro Users Guide ( Version 3.0)

Paper : I.3 Object Oriented Programming using C++

1. Introduction: Difference between C, C++. The Object-Oriented Approach, Object Oriented Methodologies and Analysis, Design and Programming Characteristics of Object-Oriented Languages  
Classes, Object, Encapsulation, Inheritance, Polymorphism, C++ and C.
2. Structures: An Introduction, Other Structure Features, and Structures within Structures, Enumerated Data Types.
3. Functions: Simple Function, Passing Arguments to functions, Returning Values from Functions, Reference Arguments, Overloaded functions. Address of an overloaded function, passing an address of an overloaded function as an argument to another function, Inline functions, default Arguments, variables and Storage Classes.
4. Objects and Classes : A Simple Class Difference between class, structure and union in C++, C++ objects. Constructors and Destructors Concept of an ADT, Constant member function, Object as function Arguments, Returning Objects from Functions, Classes, Objects and Memory, Static Class Data.
5. Operator Overloading Introduction, Overloading, Unary and Binary Operators, concatenating Strings, Comparison operators, Arithmetic Assignments Operators, Data Conversion-Between Basic Types, Between Objects and Basic Types. When to Use What.
6. Inheritance : Derived Class and Basic Class. Derived Class Constructors, Class Hierarchies, Public and Private Inheritance, Multiple Inheritance, Containership-Classes within Classes. Inheritance and Program Development.
7. Pointers : The Delete and New Operator, Pointers to Object, An Array of Pointers Objects Pointers to Pointers, Debugging Pointers, Difference Between pointer and references.
8. Virtual Functions and other subtleties : Virtual Function. Pure Virtual Functions, Friend Functions, Static Functions, Assignment and copy Initialization. The Copy constructor, The this Pointer, Abstract classes.
9. Introduction to templates and exception handling, function with Templates.
10. Files and Streams: Streams, String I/O, Character I/O, file Pointers, Error Handling, Redirection, Command-Line Arguments, Pointer Output, Overloading the <<and>> Operators.

Topic : 1.4 Internet Fundamentals and WEB Designing Tools

Concepts of Networking LAN, MAN, WAN

Basic requirement for internet

Modems, browsers, gateways, bandwidth, leased lines, ISP, voice mail

domain address types

TCP/IP setting for internet

Internet Security : Firewalls

Email services

HTML

Web Designing fundamentals

Introduction to HTML, internet protocol, communication on the Internet, URLs in HTML

Document structure Elements in HTML

Block Formatting Elements (Font, Color, Size,)

MARQUEE Elements

List Element

Form Elements

Input elements, Select elements, Option elements, character formatting, Information Type elements

Introduction to Table Elements

BORDER

CELLSPACING

ALIGN

BGCOLOR

Table and style sheets

Introduction to frames and dynamic documents

Introduction to Web publishing

Interface Design

Establishing links

Page Design

uses of GIF and JPEG files

creating a simple home page and site

Paper : 1.5 SOFTWARE ENGINEERING

1. System concept, Integrated systems, sub systems, modules.
2. Role of Systems analyst and others in system development.  
General phases of System Development Life Cycle. Feasibility Study.  
Requirements Capture Detailed. Systems Analysis, systems Design, Testing,  
on site implementation and maintenance.
3. Fact Finding methods.
4. Different Approaches to Software Development.
  - \* Classic Method: Waterfall Model.
  - \* Prototyping
  - \* Spiral Model.
5. Structured Analysis and Design method and Software Engineering techniques,  
Tools and Methodologies in system Development.
6. Application System Modeling.
  - Data Modeling : Entity Relationship method,
  - Process Modeling : Data Flow diagrams
7. Concepts of Object Oriented Modeling
8. Database Design Methods
  - Mapping E-R model to arrive at the Database Design
9. System Documentation Techniques
  - System Flow Charts.
  - Functional Decomposition Diagrams
  - Structure Charts
  - Structured Flow Charts (N-S Diagrams)
  - Logic Representation Techniques
  - Decision Trees
  - Decision Tables
  - Pseudo code and Structured English
10. Introduction to computer aided software engineering (CASE) Database  
designer, code generator in CASE tools, tools for Static and Dynamic Analysis of  
programs and the concepts of Reverse Engineering.

Reference Books :-

- Software Engineering , Roger Pressman
- System Analysis and Design , James Sen,

Paper : 1.6 Practicals based on above Subjects.

1. Write a Program to read an integer and print "N.M.U." that m any times.
2. Write program to generate prime number in the given range.
3. Write a program to calculate Simple & Compound interest.
4. Write a program to read a four digit integer and print it in words.
5. Write a program to check whether a given number is a palindrome or not.
6. Write a program to compute first 30 terms of power of 3.
7. Write a program to design class books with necessary data and function store and print list of books. And also search books of given author and print it.
8. Design class to represent bank account including following members:  
Data members :-  
Name of depositor, Account number  
Type of account, Balance  
Displaying name & balance by using transactions.
9. Define class string. Use overloaded == operator to compare two strings.
10. The class item stores item\_no, class quantity stores qty\_sale & price, class sale consist of amount in Rs. The class sale can inherit the details of item\_no , price and qty\_sale through multiple inheritance. Write a program to calculate amount.
11. Write a program to illustrate how constructors are implemented when the classes are inherited.
12. Write a program to illustrate the use of pointers to object.
13. Write a program to create a file consisting of following record  
Roll number , Name of student, Class, Address, City, Pin code.



SEM II

Paper : 2.1 Linux

Linux Fundamentals : History, Linux as an operating system, Linux as a multitasking / multuser operating system, applications, distributions (Red Hat, Caledra, S.U.S.E. ), Installing Linux, Comparison between UNIX and LINUX.

X- Windows : Overview, Comparison of Microsoft Windows Vs X-windows, X-server, Window managers, Motiff, Need of Motiff, GNOME panel, Xterm, Utilities in X-windows.

K Desktop Environment (KDE) : Concept of KDE, Installing KDE, Exploring the Desktop, Browsing the file system, configuring KDE, Using KDE utilities.

Using Shell : Concept of Shell, Bourne Shell (sh), C shell (csh), Bourne Again Shell (bash), Korn Shell (ksh), Overview of the Bourne shell, Setting environment variables in bash

Shell programming : Overview of shell programming, common Linux commands like : cat, echo, grep, , find, file, fdisk, free, kill, lpd, man, mkfs, passwd, mv, ls, paste, ping, ps, rm, rmdir, rsh, shutdown, sort, su, tail, tar, wc, pwd, cd, free, cal, clear, more, less, vi, sed etc.

Working with files : File operations like copy, move, create, delete, rename,

Awk Programming : Introduction, General structure, BEGIN and END statement, comments, keywords, identifiers, operators, input records and fields

TCP/IP fundamentals, TCP, UDP service and ports.

System Administration : Managing users, managing groups, system startup.

Using Peripherals : Understanding Linux

Reference Books :

1. Mastering Linux - Arman Danesh (BPB) (Premium Edition)
2. Linux Unleashed- (Techmedia Publications)
3. Linux configuration and Installation (3rd Edn)
  - Patrik volkerding
  - Kevin Reichard (BPB)
4. UNIX system user's Reference Manual

**NORTH MAHARASHTRA UNIVERSITY, JALGAON**

**MASTER OF COMPUTER MANAGEMENT**

**Semester II**

**COURSE 2.2 ACCOUNTING INFORMATION SYSTEM**

1. Elements of Accounting:  
Accounting concepts, Types of Accounts, Journal, Ledger, Closing entries, Adjustment entries, including-closing stock, pre-paid, payable, Receivable, Receivable in advance, Fire loss, Sample, Goods in Transit, Depreciation, Bad-debts, Reserve for doubtful debts etc. Adjusted Trial Balance, Final Account. (30 Marks)
2. Accounting tools for decision-making:  
Analysis and interpretation of financial statements - Ratio Analysis- Profitability, Liquidity and Solvency Ratio.  
Budgets - Cash and Flexible Budget.  
Break Even Analysis.  
Cash Flow and Fund Flow Statements (30 marks)
3. Computerized Accounting and Information System.  
Information system - Accounting Information system - Elements and steps and development of computerized accounting system - Input design - Record structure, output formats, file organizations, development of accounting, Data base, System flow chart, Data flow diagram. Types of Report, Generation of Reports. (40 marks)

Note: Study of Topic 3 shall be based on Topic 1 & 2 above.

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Paper : 2.3 Data structure using C++

1. Concept of data type, data object, data structure and representation, abstract data structures, introduction to analysis of data structure and algorithms
2. Arrays as ADT, implementation of arrays, Single dimensional and multidimensional.
3. Stacks as ADT, implementation of stack, push and pop operations, conversion of infix to postfix notation. Evaluation of postfix notation, concept of back-tracking, recursion using stacks (concept only)
4. Queues as ADT, implementation of queues, application of queues to preemptive scheduling in transaction processing, Circular queues using arrays.
5. Linked list as ADT, singly linked list, operations on linked list, implementations of stacks and queues using linked lists, Doubly linked lists, application of double linked lists and dynamic storage management, concept of generalized link list.
6. Trees as ADT, hash terminology, Binary tree representation using arrays and linked lists, binary tree traversal inorder, postorder, preorder (both recursive and non-recursive versions ) Threaded binary trees, traversal of threaded binary trees, binary tree representation of trees.
7. Symbol Table : concept of table, static tree table, binary search, tree definition and search algorithms, Huffman algorithm, dynamic tree table as binary search tree, Concept of height-balance (AVL) trees, introduction to rebalancing techniques (concept only), insertion and deletion of node in dynamic binary search tree, Hash table, Hashing techniques.
8. Search : Linear search, binary search, depth first search and breadth first search on binary trees
9. Sorting : Bubble sort, insertion sort, quick sort, heap sort.

Paper : 2.4 Oracle and D2K

1. Introduction to Oracle :Introduction, DBMS. Background introductions of Architecture
2. Oracle Data Types
3. Substitution variables : Define command, Using file command, Accept command
4. Invoking SQL\*PLUS : Creating of tables using CREATE TABLE, Modification using ALTER TABEL command, Deleting table using DROP TABLE command.
5. Data Constraint : Column level, table level defining integrity, constraint in alter table command, PRIMARY KEY, FOREIGN KEY, CHECK, NOT NULL.
6. SQL & Subqueries : Introduction of SELECT, FROM WHERE, IN, GROUP BY, HAVING in SQL.
7. Views & sequences : Create Views, Update Views, Naming column, predicate of views, views & join, views & Subqueries, dropping views, creating retrieving, altering & dropping sequences.
8. PL / SQL : Introduction, PL/SQL syntax, Execution environment, PL/SQL Control statement, exceptions, Utilities like DBMS\_OUTPUT.PUT\_LINE, etc.
9. Cursors : Implicit & Explicit cursor, cursor attributes.
10. Stored Procedure & function
11. Database Triggers
12. Introduction to Developer 2000 : Need with Oracle
13. Designing and Execution of Form 5.0: Basic Concepts, Application Development in Forms, Form module, creating and running form, Creating Master-Detail form with buttons, Validation for Buttons, Triggers for buttons, property class & Visual Attribute, Parameter passing, Use of Alerts & LOV's, Executing and running form.
14. Introduction to Reports : Basic Concepts, Features, Defining Data Model for report, Specify the Layout, Creation of Master-Detail report, Passing parameters, creating computed columns.

Paper : 2.5 Practicals in Linux and Data Structure

1. Write a program using c++ to implement stack containing names of students.
2. Write a program using c++ to implement queue of job numbers waiting for execution.
3. Write a program using c++ to implement insert delete operations on single linked list of employee numbers.
4. Write a program using c++ to implement insert delete operations on doubly linked list.
5. Write a program using c++ to implement insert delete operations on circularly linked list.
6. Write a program using c++ to convert infix expression to postfix expression.
7. Write a program using c++ to construct a binary tree and implement insert and delete operation.
8. Write a program using c++ to traverse binary tree in preorder, inorder & postorder.
9. Write a program using c++ to implement binary search.
10. Write a program using c++ to implement quick sort, insertion sort.

1. write a shell script which accept username as input if the user has log in say "hello" to him.

2. write a shell script, which print names of files in the current working directory in alphabetical order.

3. write a shell script to get the following statistical report for the current directory in the following only: -

name of the current directory...

file of current directory

file type	no. of files
1) ordinary files	-----
2) directory files	-----
3) special files	-----

4. The files "xyz" has data in the following format:

arun	101	edp-incharge
maduri	105	programmer

write shell script which display content of file "xyz" in ascending order in employee file and having the field in the following order  
empno, name, designation

4. Write a program to create a file "result" using three (3) input files "stud", "marks", "rollno" with the help of cut and paste command.
5. write a script to print a file with odd & even pages separately.
6. Write a program to find out gcd of two numbers.
7. Program to generate first twenty (20) terms of fibonacci series.
8. Program to determine the given no is +ve, -ve or zero.
9. write a shell script for file-name message as per time as evening.
10. Write an awk program to print all files name having same no of characters.
11. The data in the files "student" is in the following format :

Name	age	rollno	course	proj.status
Vijay	22	43	dcm	y
Ajay	27	03	mcm	y
Raju	25	12	mcm	n
Jay	33	99	dca	y

- (i) print rollno and name
- (ii) print list of student who have completed their project.
- (iii) print the name of the oldest student.
12. The data in the files "stud" is in the following format :

Name	age	rollno	course	proj.status
Vijay	22	43	dcm	y
Ajay	27	03	mcm	y
Raju	25	12	mcm	n
Jay	33	99	dca	y

- (I) Print the list of student who have taken mcm course.
- (II) Print the average age of all student.
- (III) Print the youngest student name.
13. Print the file in the reverse order of the records.
14. Print the number of empty lines in the files (consider you have created a file with some empty lines between records)



**NORTH MAHARASHTRA UNIVERSITY, JALGAON**

**M.C.M. SEMESTER-II**

**Subject :- 2.6-Lab based on 2.2 and 2.4**

**(w.e.f. July, 2001)**

**A. 2.2 Accountancy Information System**

**List of practical**

1. Create master tables to store customer details, supplier Details and item Details.
2. Create transaction tables to store sales, purchase cash receipts and cash payments details, bank receipts, bank payment.
3. Design suitable forms for master data entry for
  - Customers
  - Suppliers
  - Items
4. Design Forms to enter Transaction details for
  - SALES - BILL
  - PURCHASE -BILL
  - CASH -RECEIPTS
  - CASH-PAYMENTS
  - BANK RECEIPTS
  - BANK PAYMENTS

**B. Note for Practicals based on 2.4**

The above Practicals Can be performed using either Oracle -D2k or Visual Foxpro