

P.E.S COLLEGE OF ENGINEERING,MANDYA - 571401
 (An Autonomous Institution Under VTU Belgaum)
SCHEME OF TEACHING AND EXAMINATION (2008-09)
II SEMESTER MCA (Master of Computer Applications)

Sl. No	Course Code	Course Title	Credit L : T : P	Total	Examination		
					Marks		
					CIE	SEE	Total
1	P08MCA201	Business Data Processing with COBOL	4:1:1	6	50	50	100
2	P08MCA202	Introduction to UNIX	3:1:1	5	50	50	100
3	P08MCA203	Data Structures Using C	4:1:1	6	50	50	100
4	P08MCA204	Management Information Systems	3:1:0	4	50	50	100
5	P08MCA205	Operations Research	3:1:0	4	50	50	100
		Total		25	250	250	500

* L: Lecture T: Tutorial P: Practical

II Semester Master of Computer Applications

Business Data Processing with COBOL

Course Code : P08MCA201
4:1:1=6
Total Hours : 52
SEE:50

Credit :

CIE:50

1. Introduction **3**
Hrs

Coding Format for COBOL Programs, Structure of a COBOL Program, Character Set, COBOL words, Data Names and Identifiers, Literal, Figurative Constants, Continuation of lines and notations

2. Identification, Environment and Data Division **4**
Hrs

General Formats, Configuration Section, Input-Output Section, Level Structure, Data Description entries, Picture Clause, Value Clause, File Section, Working-storage Section, Editing characters of different data and examples, Special-names Paragraph, Classes and Categories of Data

3. Procedure Division and Basic Verbs **5**
Hrs

Structure of the Procedure Division, Data Movement Verb and other options of Move Statements, Arithmetic Verbs, Sequence Control Verbs, Input and Output Verbs, Conditional Verbs simple IF, categories of COBOL statements.

4. Different Types of Clauses and other Verbs **3 Hrs**

Usage Clause, Synchronized Clause, Justified Clause, Redefines Clause and Renames Clause, Qualification of Data Names, Sign Clause, Elementary and Group Moves, Corresponding Option: Move Corresponding, Add Corresponding and Subtract Corresponding, Rounded Option, On Size Error Option, Compute Verb

5. Computation and Decision Making **8 Hrs**

Interactive Processing using Screen Sections, Intrinsic Functions, Conditions: Relational Condition, Class Condition, Condition Name Condition, Negated Simple Condition, Compound Condition, Sign Condition, If Statements, Alter Statement, Perform Statements, Exit Statement

6. Array Processing and Table Handling **6 Hrs**

Occurs Clause and Subscripting, assigning values to table elements, Multi Dimensional Tables, Perform and Table Handling, Indexed Tables and Indexing, Set Verb, Search Verb, Occurs Depending Clause, Index data item.

7. Sequential File Processing, Sorting and Merging of Files **10 Hrs**

File Characteristics, File Control Entries, File Description, Statements for Sequential Files, Sequential File with Variable Length Records, IO Control Paragraph, Simple Sort Verb, File updation, Variation of updation, simple Merge Verb, Input and Output Procedure in Sort Statement, Merge Verb with Output Procedure

8. Indexed and Relative File Processing, Report Writer, and Subroutines **10 Hrs**

File Control Paragraph for Relative: Files, Procedure Division .statements for Relative Files Indexed Sequential Files, Procedure Division Statements, Sample Program, Structure of a COBOL Subroutine, Calling of a Subroutine, State of Subroutine and Cancel Statement, Advantages and Disadvantages of COBOL Subroutines

Text Books:

1. COBOL Programming including MS COBOL and COBOL-85, M K Roy and D Ghosh Dastidar, 2nd Edition, Tata McGraw Hill, 2001.
Chapters: 3.1 to 3.10, 4.1, 4.2, 5.1 to 5.7, 6.1 to 6.7, 8.1 to 8.7, 9.1 to 9.5, 10.1 to 10.6, 11.1 to 11.10, 13.1 to 13.4, 13.6, 14.1 to 14.7, 16.1, 16.2, 18.1 to 18.7, 19.1 to 19.6.
2. Structured COBOL Programming, Nancy Sten and Robert A Sten, 8th Edition, John Wiley & Sons, 1998. Chapters: 1, 6, and 7.

Reference Books:

1. Structured COBOL Programming, Gary B Shelly, Thomas J Cashman, Roy O Foreman, 2nd Edition, Thomson Course Technology, 1999.
2. Introduction to COBOL, A Guide to Modular Structured Programming, David M. Collopy, 1st Indian Reprint, Pearson Education, 2005.

Introduction to UNIX

Course Code : P08MCA202
Total Hours :39

Credit : 3:1:1=5
CIE:50 SEE:50

Unit I: **7 Hrs**

General Purpose Utilities: banner, cal, date, calendar, who, printf, tty, stty, uname, passwd, lock, echo, tput, bc script, spell and ispell.

Navigating the File System: The file, what's in a filename? the parent-child relationship, pwd, the Home directory, Absolute pathnames, using absolute pathnames for a command, cd, mkdir, rmdir, Relative pathnames, The UNIX file system

Handling Ordinary Files: cat, cp, rm, mv, more, lp, file, wc, od, split, cmp, comm., diff.

Unit II: **5 Hrs**

The vi editor: The Three Modes, Input Mode, Saving, The Repeat Factor, Command Mode, Deletion, Navigation, Pattern Search, Joining lines, Repeating the Last command, undoing the Last Editing Instructions, Search and Replace.

Basic File Attributes: ls -l, the -d option, File Permissions, chmod.

Security and File Permission: users and groups, security level, changing permission, user masks, changing ownership and group

Unit III: **6 Hrs**

Shell Programming: Shell Scripts, read, Command Line Arguments, Exit Status of a Command, The Logical Operators && and ||, exit, -if, and case conditions, expr, sleep and wait, while, until, for, \$, @, redirection, The here document, set, trap, Sample Validation and Data Entry Scripts.

The Process: process basics, PS, internal and external commands, running jobs in background, nice, at and batch, cron, time commands

Customizing the Environment: System . Variables, profile, sty, PWD, Aliases, Command History, On- Line Command Editing

Unit IV: **5 Hrs**

More file attributes: hard link, symbolic link, umask, find

Simple filters: PR, head, tail, cut, paste, sort, uniq, tr commands

Unit V: **5 Hrs**

Filters using Regular Expression and the grep Family: grep, Regular Expression, egrep, fgrep, a sed instruction, Line Addressing, Inserting and Changing Text, Context addressing, writing selected lines to a file, The -f option, Substitution, Properties of Regular Expressions

UnitVI: **5Hrs**

Essential Shell Programming: shell script, read, exit, the if conditional, using Tests and [] to evaluate expression, the case conditional expr, while: looping, for: looping with a list, set and shift, trap, debugging shell scripts with Set - X.

Essential System Administration: root, administrator's privileges, startup & Shutdown, managing disk space, cpio, tar

Unit VII:

3 Hrs

awk-Advanced Filters: Simple awk Filtering, Splitting a Line into Fields, printf, the Logical and Relational Operators, Number Processing, Variables, The -f option, The BEGIN and END Positional Parameters, get line, Built-in variables, Arrays, Functions, Interface with the Shell, Control Flow.

**Unit VIII:
3Hrs**

Advanced Shell Programming: The sh command, export, cd, the Command, expr, Conditional Parameter Substitution Merging Streams; Shell Functions, eval, Exec Statement.

Advanced vi: Operators, the ex mode, named buffers, Numbered Buffers, Entering Control Characters, Searching for a Character, Marking Text Customizing, vi

Text Books:

1. UNIX Concepts and Applications, Sumitabha Das, 4th Edition, Tata McGraw Hill, 2006. Chapters: 1,2,3,4,5,6, 7, 8,9, 10, 11, 12, 13, 14,21,20,21.
2. UNIX and Shell Programming, Behrouz A Forouzan and Richard F Gilberg, 1st Edition, Thomson Course Technology, 2005 Chapter: 4.

Reference Books:

1. UNIX: The Complete Reference, Kenneth Rosen et al, Osborne/McGraw Hill, 2000.
2. Using UNIX, Steve Montsugu, 2nd Edition, Prentice Hall India, 1999.
3. UNIX and Shell Programming, M G Venkateshmurthy, Pearson Education Asia, 2005.

Data Structures Using C

Course Code : P08MCA203

Total Hours : 52

Credit : 4:1:1=6

CIE:50 SEE:50

1. Introduction to Data Structures

10 Hrs

Information and its meaning: Abstract Data Types, Sequences as value Definitions, ADT for Varying-length Character Strings, Data Types in C, Pointers in C, Data Structures and C. Arrays in C: the Array as an ADT, Using One-dimensional Arrays, Implementing One-dimensional Arrays, Arrays as Parameters.

Structures in C: Implementing Structures, Unions, Implementation of Unions, Structure Parameters, Representing other Data Structures, Rational Numbers, Allocation of Storage and Dynamic Memory Allocation and Cancellation in C

2. The Stack

5 Hrs

Definition and examples, Primitive operations, Example, The stack as an ADT, Representing stacks in C, Implementing the pop operation, Testing for exceptional conditions, Implementing the push operation, Examples for infix, postfix, and prefix expressions, Basic definition and examples, Program to evaluate a postfix expression, Converting an expression from infix to postfix, Program to convert an expression from infix to postfix

3. Recursion.

4 Hrs

Recursive definition and processes, Factorial function, Multiplication of natural numbers, Fibonacci sequence, Binary search, Properties of recursive definition or algorithm. Recursion in C, Factorial in C, Fibonacci numbers in C, Binary search in C, Towers of Hanoi problem.

4. Queues and Lists

10 Hrs

The queue and its sequential representation, the queue as ADT, C implementation of queues, Insert operation, Priority queue, Array implementation of a priority queue.

Linked lists, Inserting and removing nodes from a list, Linked implementation of stacks, get node and free node operations, Linked implementation of queues, Linked list as a data structure, Example of list operations, Header nodes, Lists in C, Array implementation of lists, Limitations of array implementation, allocating and freeing dynamic variables, Linked lists using dynamic variables, Queues as lists in C, Examples of list operations in C, Non integer and non-homogeneous lists, Other list structures: Circular lists, Stack as a circular list, Queue as a circular list, Primitive operations on circular lists, doubly linked lists

5. Trees

10 Hrs

Binary trees, operations on binary trees, Applications of binary trees, Binary tree representation, Node representation of binary tree, Internal and external nodes, Implicit array representation of binary trees, Choosing a binary tree representation, Binary tree traversal in C, Threaded binary trees.

6. Sorting

8 Hrs

Bubble Sort, Quick Sort, Selection Sort, Tree Sorting: Binary Tree Sort, Heap Sort, Insertion Sorts: Simple Insertion, Shell Sort, Address Calculation Sort, Merge and Radix Sort

7. Searching

5 Hrs

Basic Search Techniques: Algorithmic notation, Sequential searching, Searching an ordered table, Indexed sequential search, Binary search, Interpolation search, Tree searching: Inserting into a Binary Search Tree, Deleting from a Binary Search Tree, Hashing: Resolving hash clashes by open addressing, Choosing a hash function.

Text Book:

1.Data Structures using C and C++ by Yedidyah Langsam and Moshe J. Augenstein and Aaron M Tenanbaum, 2nd Edition, Pearson Education Asia, 2002.

Reference Books:

1.Data Structures and Algorithm Analysis in C, Mark Allen Weiss, 2nd Edition, Pearson Education Asia, 1997.

2.Data Structures - A Pseudocode Approach with C, Richard F Giberg and Behrouz A Forouzan, 3rd Reprint, Thomson Course Technology, 2005.

Management Information Systems

Course Code : P08MCA204
Total Hours : 39

Credit : 3:1:0=4
CIE:50 SEE:50

1. Systems Engineering **4 Hrs**

System concepts, system control, types of systems, handling system complexity, Classes of systems, General model of MIS, Need for system analysis, System analysis for existing system & new requirement, system development model, MIS & system analysis

2. Information and Knowledge **3 Hrs**

Information concepts, classification of information, methods of data and information collection, value of information, information: A quality product, General model of a human as information processor, Knowledge,

3. Introduction of MIS **3 Hrs**

MIS: Concept, Definition, Role of the MIS, Impact of MIS, MIS and the user, Management as a control system, MIS support to the management, Management effectiveness and MIS, Organization as system. MIS: organization effectiveness

4. Strategic Management of Business **3 Hrs**

Concept of corporate planning Essentiality of strategic planning, Development of the business strategies, Type of strategies, short-range planning, tools of planning, MIS: strategic business planning

5. Development of MIS **4 Hrs**

Development of long range plans of the MIS, Ascertaining the class of information, Determining the information requirement, Development and implementation of the MIS, Management of information quality in the MIS, Organization for development of MIS, MIS development process model

6. Developing Business/IT Strategies/IT Solutions **5 Hrs**

Planning fundamentals (real world cases), Organizational planning, planning for competitive advantage, (SWOT Analysis), Business models and planning. Business/IT planning, identifying business/IT strategies, Implementation Challenges, Change management, Developing business systems, (real world case), SDLC, prototyping, System development process, implementing business system

7. Business Process Re-Engineerin **2 Hrs**

Introduction, Business process, process model of the organization, value stream model of the organization, what delay the business process, relevance of information technology, MIS and

8. Technology of Information System

3 Hrs

Introduction, Data processing, Transaction processing, Application processing, information system processing, TQM of information systems, Human factors & user interface, Strategic nature of IT decision, MIS choice of information technology

9. Decision Making and DSS

3 Hrs

Decision making concepts; decision making process, decision-making by analytical modeling, Behavioral concepts in decision making, organizational decision-making, Decision structure, DSS components, Management reporting alternatives.

10. Electronic Business systems

4 Hrs

Enterprise business system - Introduction, cross-functional enterprise applications, real world case, Functional business system, - Introduction, marketing systems, sales force automation, CIM, HRM, online accounting system, Customer relationship management, ERP, Supply chain management (real world cases for the above)

11. Client Sever Architecture and E-business Technology

5 Hrs

Client server architecture, implementation strategies, Introduction to E-business, model of E-business, internet and World Wide Web, Intranet/Extranet, Electronic, Impact of Web on Strategic management, Web enabled business management, MIS in Web environment.

Text Books:

1. Management Information Systems - Waman S Jawadekar, 3rd Edition, Tata McGraw Hill, 2007. Chapters: 1,3.1 to 3.6 & 3.9,6.1 to 6.9, 7.1 to 7.6 & 7.8, 8.1 to 8.10 & 8.13, 10, 11, 16.1 to 16.7 & 7 & 16.10 & 16.12, 18.7, 18.8,20
2. Management Information Systems, James A O'Brien and George M Marakas, 7th Edition, Tata McGraw Hill, 2006. Chapters : 1, 5, 7, 8, 9, 10, 11., 12.

Reference Books:

1. Principles of information Systems, Ralph M Stair and George W Reynolds, 6th Edition., Thomson: 2003.
2. Information Systems - The Foundation of E-Business, Steven Alter, 4th Edition, Pearson . Education Asia, 2002.
3. Management Information System, Mahadeo Jaiswal and Monika Mital, 3rd Edition, Oxford University Press, 2006.
4. Management Information Systems - Effy Oz, 5th Edition, Thomson Course Technology, 2007.

Operations Research

Course Code : P08MCA205
Total Hours :39

Credit : 3:1:0=4
CIE:50 SEE:50

1. Introduction and Overview of the OR Modeling Approach **3 Hrs**

The origin of OR, the nature of OR, the impact of OR, defining the problem and gathering data, Formulating a mathematical model, deriving solutions from the model, testing the model, preparing to apply the model, implementation.

2. Introduction to Linear Programming **6 Hrs**

Formulation of linear programming problem (LPP), examples, Graphical solution, the LP Model, Special cases of Graphical method, assumptions of Linear Programming (LP), additional example

3. Solving LPP - the Simplex Method **12 Hrs**

The essence of the simplex method, setting up the simplex method, algebra of the simplex method, the simplex method in tabular form, special cases in the simplex method, tie breaking in the simplex method, adopting to other model forms (Two Phase method, Big-M method), post optimality analysis.

4. Theory of the Simplex **4 Hrs**

Foundation of the simplex method, the revised simplex method, Simple problems a fundamental insight

5. Duality Theory and Sensitivity Analysis **9 Hrs**

The essence of duality theory, economic interpretation of duality, primal dual relationship, adapting to other primal forms, the role of duality in sensitive analysis, the dual simplex method

6. Transportation and Assignment Problems **6 Hrs**

The transportation problem, a stream line simplex method for the transportation problem, the assignment problem, a special algorithm for the assignment problem

7. Metaheuristics **6 Hrs**

The nature of Metaheuristics. Tabu Search, Simulated Annealing, Generating Algorithms

8. Game Theory **6 Hrs**

The formulation of two persons, zero sum games, solving simple games- a prototype example, games with mixed strategies, graphical solution procedure, solving by linear programming, extensions

Text Books:

1. Introduction to Operations Research, Frederick S. Hillier and Gerald J. Lieberman, 8th Edition, Tata McGraw Hill, 2005.

Chapters: 1.1 to 1.3, 2.1 to 2.6, 3.2 to 3.4, 4.1 to 4.7, 5.1 to 5.3, 6.1 to 6.7, 7.1, 8.1 to 8.4, 13.1 to 13.4, 14.1 to 14.6

Reference Books:

1.

Operations Research Applications and Algorithms, Wayne L. Winston, 4th Edition, Thomson Course Technology, 2003.

2.

Operations Research: An Introduction, Hamdy A Taha, 8th Edition, Prentice Hall India, 2007. Theory and Problems of Operations Research, Richard Bronson and Govindasami Naadimuthu, Schaum's outline, 2nd Edition, T