Shri VaishnavVidhyapeethVishvavidhyalaya, Indore

Institute of Computer Applications

Name of Program : MCA + Ph.D.

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
MCCA101	COMPULSORY	Mathematical Foundation of Computer Science	60	20	20	0	0	3	1	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical;   C - Credit;
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CourseEducationalObjectives (CEOs):

- To introduce the students with the Discrete Mathematics, Probability and Statistics.

Course Outcome (COs)s (Cos): After the successful completion of this course students will be able to

- understand and apply the fundamentals of the discrete mathematics.
- find probability of a random event.
- apply the techniques in the testing of quality of an item.
- know the degree of the dependence among the variables.

UNIT – I
Discrete Mathematics: Sets, Relations, Functions, Logic Operators, Truth Table, Normal Form, Propositional and Predicate Calculus, Boolean Algebra, Trees, Graphs, Bipartite graph

UNIT – II
Discrete Mathematics: Euclidean Algorithms, Fibonacci Numbers, Congruence and Equivalence Relations, Groups and Subgroups, Semi-group, Monoids, Planar and Dual BFS and DFS Algorithm, Floyd's & Dijskstra Shortest Path Algorithm, Kruskal & Prisim's algorithms for minimum cost spanning tree, Regular expressions, Finite state machine, Grammars

UNIT – III

Discrete Mathematics: Error Detecting and Correcting Codes, Permutation and Combination, Pigeon Hole Principle, Principle of Exclusion and Inclusion, Ordinary and Exponential Generating Function, Recurrence Relation

UNIT – IV
Probability: Axioms, Conditional probability, Bayes theorem, Random variable, Discrete RV- Binomial & Poisson RV, Continuous RV – Uniform, Exponential, Normal RV, Expectation, Mean and Variance

UNIT – V
Probability: Sample distribution, Inference concerning mean, Statistical inference- parameter estimation, Maximum likelihood estimation, Testing of Hypothesis, Curve fitting-Method of the least square, Curvilinear multiple regression.

Text and Reference Books:
1. C. L. Liu, Elements of Discrete Mathematics, Tata McGraw-Hill
2. Trembly J. P. & Manohar P., Discrete Mathematical Structure with applications to computer science, McGraw-Hill
3. Ross S., A First course in Probability, Sixth edition, Pearson Education
4. Ross Sheldon, Introduction to Probability Model, Eighth edition, Elsvier, 2003
5. Trivedi K. S., Probability and Statistics with Reliability, Queuing and Computer Science Applications, Second edition, Wiley, 2002

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MCCA102	COMPULSORY	Introduction to Programming Languages through C	60	20	20	30	20	4	1	6	8

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Course Education Objective (CEOs):

The languages that programmers use are constantly changing, and the popular languages of today will surely be replaced by new ones. The objective of this course is to provide students with a working knowledge of the basic principles underlying the design of all computer programming languages.

Course Outcome (COs)s: Students completing this course should be able to quickly learn to effectively use new computer programming languages. In particular, after taking this course students should be able to do the following:

- Evaluate programming language features and designs.
- Solve problems using the functional, object-oriented, and declarative paradigms.
- Describe the strengths and limitations of the imperative, functional and object-oriented paradigms for solving different kinds of problems (or in different application domains), especially in relation to each other.
- Explain and answer questions about specific languages that illustrate different paradigms, including questions about relevant concepts and major features.
- Design, define, and evaluate parts of programming languages or similar systems and justify your design decisions.

Unit I:

Concept of problem solving, Problem definition, Flowcharting, Decision table, Algorithm. Introduction to Programming, Program Development Life Cycle, Characteristics of a good program - accuracy, simplicity, robustness, portability, minimum resource and time requirement, modularization; Categories of Programming Languages, Programming Paradigms: monolithic, Procedural, structured, Non Procedural Types of errors in programming Debugging.

UNIT II:

Overview of C: History of C, Features of C, Structure of C program. Elements of C: C character set, identifiers and keywords, data types: primitive and user defined, Constants and variables.
Operators and Expressions: Arithmetic, relational, logical, bitwise, unary, assignment and conditional operators and their precedence and associatively, Type modifiers and type casting. Control Structures – Statement Level, Compound Statements, Selection, Iteration.
Input/ Output: Unformatted and Formatted I/O functions in C.

Unit III:

Functions: Definition, prototype, Function call, parameters, parameters passing – call by value, call by reference. Return value. Storage Classes in C: auto, extern, register and static storage class, their scope, storage and lifetime of variable, design issues for functions**,** recursion, Recursion v/s Iteration, types of recursion. Special constructs – Break, continue, exit(), goto and labels;
Arrays: Definition, Access of Elements, initialization; Multidimensional arrays, character arrays.

Unit IV:

Pointer: address and dereferencing operators, declaration, assignment, initialization, comparison, conversion and arithmetic of pointers. pointer to pointer. pointer and arrays, Array of pointers and its limitation, Dynamic memory management using functions like malloc(), calloc(), realloc(), free() etc.. Function returning pointers; Pointer to function, Function as parameter.
Structure: Structure –basic, declaration, membership operator, pointer to structure, referential operator, self referential structures, structure within structure, array in structure, array of structure

Unit V:

Pre-processor directives: #include, #define, #undef, #if, #ifdef, #ifndef, #else, #elif, #endif, #error, #pragma. Predefine macros. Command line arguments. Variable argument list functions.

List of Experiments:

1. Define an algorithm and flowchart. Draw algorithm and flow chart for a program that converts an input Fahrenheit degree into Celsius equivalent.
2. Write an algorithm and a C program to find the greatest among three numbers.

3. WAP to print an input string in lower case, upper case and mixed case using library function.
4. WAP a C program to reserve an input number.
5. Draw a flow chart to find prime number from 1 to 100.
6. Write a C program to obtain the sum of first n terms of the following series:
   $X - X^3/3! + X^5/5! - X^7/7! + \ldots$
7. WAP to calculate factorial of a number using different loops.
8. WAP to calculate factorial of a number using recursion.
9. WAP in C to generate Fibonacci series.
10. WAP in C to generate Pascal triangle.
11. WAP in C to swap value and address of two variables.
12. WAP in C to search a given element in an array using linear and binary search.
13. WAP to sort an integer array in ascending and descending order according to user's choice.
14. Write a menu driven program to perform matrix addition, subtraction and multiplication.
15. Write a program to sum diagonal elements of two matrices.
16. WAP a C program to reverse a string by recursion.
17. WAP using structure in C to generate student mark-sheet for 3 students with student details name, course, and semester and with marks in 5 subjects, assume max mark in each subject as 100 and passing marks as 35.

TEXT BOOKS:

1. Kanitkar Yashwant, 'Let us C', BPB New Delhi
2. Balaguruswami, 'Ansi C', TMH, Delhi
3. Kerninghan & Ritchie, "The C programming language", PHI
4. Schildt, "C:The Complete reference" 4th ed TMH.
5. Cooper Mullish, "The Spirit of C", Jaico Publishing House, Delhi
6. Byron S. Gottfried, "Programming with C", Schaum's Outline Series Mcgraw –Hill, II-Ed.
7. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.
8. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.

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MCCA103	COMPULSORY	Business Accounting	60	20	20	0	0	3	1	0	4

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Course Educational Objectives (CEOs):

- The objective of this course is to acquaint the students with the basic concept of Financial, Cost, and Management Accounting
- To develop understanding of Accounting for Managers for Decision Making.

Course Outcome (COs)s

- Understand the role of accounting in business,
- Develop an understanding of the basic accounting framework
- Record basic business events culminating into a balance sheet, and
- Apply the financial accounting concepts using any standard accounting package.

Unit I: Introduction to Financial Accounting

1. Basic Accounting Concepts and Fundamental Conventions
2. Concept of Double Entry System
3. Basic knowledge of Accounting Process: Journal, Ledger
4. Trial Balance, Closing Entries, Opening Entries, Subsidiary Books
5. Preparation of Final Accounts : Manufacturing, Trading , Profit and Loss Account and Balance Sheet

Unit II: Depreciation and Decision Making

1. Depreciation and its importance in Decision Making
2. Straight Line Method
3. Written Down Value Method
4. Bank Reconciliation

Unit III: Cost Accounting

1. Need for Cost Information, Cost Objective
2. Elements of Cost and Classification of Costs
3. Concept, Elements and Managerial Uses of Unit Cost, Batch Cost
4. Cost Control and Cost Reduction
5. Target Costing and Activity Based Costing

Unit IV: Management Accounting

1. Basic Management Accounting Concepts
2. Relationship with Financial Accounting and Cost Accounting
3. Break Even Analysis, Contribution Analysis and Segment Contribution and their use in Profit Planning

Unit V: Variance Analysis

1. Standard Costing and Variance Analysis
2. Material Variance, Labor Variance, Overhead Variance
3. Sales Volume Variance, Margin Variance and Profit Variance
4. Use of these Variance

TEXT BOOKS:

1 P.C. Tulsian, Financial Accounting, Pearson, 2008

2. S.N. Maheshwari, Introduction to Accountancy, New Delhi, Vikas Publishing House, 10th Edition, 2009

3. Hansen, Management Accounting, 7th edition Cengage Learning,India

4. N. Ramchandran and RamkumarKakani, Financial Accounting for Management, New Delhi, Tata-Mac Graw-Hill, 2nd Edition, 2008.

5. Paresh Shah, Basic Financial Accounting for Management, New Delhi, Oxford University

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MCCA104	COMPULSORY	PC Software	60	20	20	30	20	4	1	4	7

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Course Educational Objectives (CEOs)s:-
1. To provide the knowledge of using different software packages including word processor, electronic spreadsheet, presentation s/w
2. To develop an understanding of database management system
3. To explain how to integrate the data stored in word processor, spreadsheet etc.
4. To develop presentation skills using these software.

Course Outcome (COs)s:-Students will be able to
1. To create word documents and to format them using various tools available
2. To create tables and manipulate them
3. To use mail merge, labels
4. Creating spreadsheet for storing and managing data using functions
5. Format, print spreadsheet
6. Create power point presentation for different purposes using objects, animation
7. To store and manipulate data stored in databases.
8. To export and import data stored from and to, among word processor, spreadsheet, DBMS, presentation s/w

Unit – 1

Windows Basics – Introduction to word processor– Editing a document - Move and Copy text - Formatting text & Paragraph – Enhancing document – Columns, Tables and Other features.

Unit – 2

Introduction to worksheet and shell – getting started with Excel – Editing cell & using Commands and functions – Moving & Copying , Inserting & Deleting Rows & Columns - Printing work sheet.

Unit – 3

Creating charts – Naming ranges and using statistical, math and financial functions, database in a worksheet – Additional formatting commands and drawing toolbar – other commands & functions – multiple worksheet and macros.

Unit – 4

Overview of Presentation Software – presenting shows for corporate and commercial using presentation. Introduction to Desktop publishing – Computer viruses – Introduction to Internet – Web features.

Unit – 5

DBMS: Introduction, Basic terms of access, objectives, What is database, Creating a new database, Creating a database through table wizard, Creating a new table, Rename columns, Saving the database, Relationships, Creating table through design view, Query, Form, Reports.

List of Experiments:
1. To open and practice of OS – Folder related operations, My-Computer, window explorer, Control Panel,
2. To create, save and editing of Text files using word processor.
3. Formatting and printing of document (setting of margins, size, orientation, different breaks etc. Checking of spelling and use of thesaurus
4. Creating, inserting tables, header, footers, hyperlink, different objects in a document.
5. Use of Charts in Word processor.
6. Creating a mail merged documents, labels
7. Creating and manipulating spreadsheets. To create, save and editing of spreadsheets. Use of cell references, sorting and filtering data in a spreadsheet, using formulae.
8. Formatting and printing of spreadsheets (setting of margins, size, orientation, different breaks etc. What if analysis, mail merging.
9. Creating header, footers, hyperlink, different objects in a spreadsheet.
10. Creating different types of graphs and printing.
11. Creation, editing and formatting presentation slides.
12. Create presentation for different purposes using objects, animation.
13. Creation and manipulation of database table using SQL.
14. To store and manipulate data stored in databases.
15. To export and import data among word processor, spreadsheet, DBMS, presentation s/w.

Text Book:
1. *Taxali R. K. "PC Software for Windows 98, Made Simple" TMH.*
2. *Saxena Sanjay, "MS Office 2000 "Vikas Publication House PVT LTD.*
3. *Busbby M. and Stultz R.A. "Microsoft Office 2000", BPB.*
4. *Jain S., Geetha M. and Kratika, "Microsoft Office-2007", BPB*
5. *Microsoft Office – Complete Reference – BPB Publication.*

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			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
MCCA105	COMPULSORY	Fundamentals of Computers & IT	60	20	20	0	0	4	1	0	5

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Course Educational Objectives (CEOs)s:-
1. To create basic understanding of Computer System
2. To provide knowledge of concepts of Operating Systems
3. To familiarize the students with the need, goal, function and architecture of various operating system available
4. To develop the understanding of trends of IT industry, safe and ethical use of IT

Course Outcome (COs)s:-students will be able to
1. To understand the need, goal and function of the OS
2. Understand and use Windows and Linux operating systems commands.
3. Organizing and manipulating files and folders.
4. Understand and Use different editors of Linux
5. Manipulating data using input output redirection
6. Writing shell scripts
7. To exercise the safe computer practices

UNIT-I

Basic concepts of IT, Data and Information, Data Processing: History, Classification, Types of Computers. Type of languages, organization of computers Hardware: CPU, Memory RAM, ROM, EPROM, PROM and other types of Memory. Input, Output and Storage Devices

Configuration of Computer System, Capabilities, Limitations and Applications of computers Software: System and Application Software, Utility packages, Applications of Information Technology:

UNIT-II
Translators: Assembler, Elements of assembly language programming, pass structure of assembler, design of single pass and two pass assemblers. Compiler and Interpreter: aspects of compilation, memory allocation, compilation of expression, compilation of control structures, code optimization, interpreters.

Linker & Loaders: Relocation & linking concepts, design of linkers, self relocating programs, a linker for MS DOS, linking for overlays. **Loaders:** A two pass loader scheme, Relocating loaders, subroutine linkage, Direct linking loader, Binders overlays.

Macros and Macro Processors: Macro definition & Call, Macro expansion Nested macro calls, advanced macro facilities.

UNIT-III
Concept of Character, Field, Record and File. Master File, Transaction File, Archival File. Keys: Primary Key, Secondary key, foreign key etc. File Organization: Sequential file, Indexed Sequential file, Random files. Multi key organization, multi key access, multi list file organization, inverted files and their definitions, file operations, Comparison of various file organization. Design of Data Files, Files Security and Back- Up.

UNIT- IV
Use of Communication and IT, Introduction to Computer Networks, Types of Network - LAN, WAN, MAN, Internet, Topologies of LAN - Ring, Bus, Star, Mesh and Tree Topologies, World Wide Web and its Applications and Internet Services.

Information Security and Integrity: Basic Concepts, Perverse Software, Preventive Measures and treatments.

UNIT-V
Software Tools: Software tools for program development, editors, debug monitors, programming environment, user interfaces.
Operating System: An overview. Introduction to MS-DOS/ WINDOWS/ LINUX/ UNIX.

Reference Books:
1. Raja Raman V., "Fundamental of Computers" (4th edition.), Prentice Hall of India, New Delhi.
2. Trainer T., et al, "Computers", McGraw Hill.
3. Norton, Peter, "Introduction to Computers, Mc-Graw-Hill.
4. B. Ram, "Computer Fundamentals", New Age International Pvt.Ltd.
5. S. Jaiswal, "Fundamental of Computer & IT", Wiley dream tech India.
6. Computers Today, S.K Basandra, Galgotia publications.
7. Fundamentals of Information Technology Alexis Leon & Mathews Leon, Vikas publishing.

8. *D.M. Dhamdhere " System Programming & O.S." 2nd Ed., Tata Mc. Graw Hill.*
9. *Sardes D.H. "Computer's today" McGraw Hill 1988.*