

Shri Vaishnav Institute of Computer Applications

Sem I

Batch 2020-21

Name of Program: MCA

COURSE CODE	CATEGORY	COURSE NAME	L	Т			TEACHING & EVALUATION SCHEME					
							TI	HEORY	PRACTICAL			
					Р	CREDITS	END SEM University Exam	Two Term Exam	Teacher Assessment*	END SEM University Exam	Teacher Assessment*	
MCAMA101	COMPULSORY	Mathematical Foundation of Computer Science	3	1	0	4	60	20	20	0	0	

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Objectives:

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

Course Outcome: 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.

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UNIT – I

Discrete Mathematics: Sets, Relations, Functions, Logic Operators, Truth Table, Normal Form, Boolean Algebra, Trees.

UNIT – II

Discrete Mathematics: Congruence and Equivalence Relations, Groups and Subgroups, Semi-group, Monoids examples and properties.

UNIT – III

Discrete Mathematics: Permutation and Combination, Pigeon Hole Principle, Principle of Exclusion and Inclusion, Ordinary and Exponential Generating Function, Recurrence Relation.

UNIT – IV



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

Probability: Sample distribution, Testing of Hypothesis, Curve fitting-Method of the least square.

Text 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
- 1. Trivedi K. S., Probability and Statistics with Reliability, Queuing and Computer Science Applications, Second edition, Wiley, 2002.





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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCA101	COMPULSORY	Programming with C Language	3	1	4	6	60	20	20	30	20

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Course Objective: 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: 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,



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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. Predefined 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.



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- 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 $X^3/3! + X^5/5! X^7/7! + \dots$
- 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:

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- 1. KanitkarYashwant, Let us C", Edition 16th 2017, BPB NewDelhi
- 2. Balaguruswami, Ansi C, McGraw Hill Education; Eighth edition 2019, TMH, Delhi
- 3. Kerninghan& Ritchie "The C programming language", Pearson Education India; 2 edition (2015)PHI
- 4. Schildt "C:The Complete reference" McGraw Hill Education; 4th edTMH 2017
- 5. Byron S. Gottfried, "Programming with C", Schaum's Outline Series Mcgraw –Hill, II-Ed.
- 6. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.
- 7. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech,rp-2007.



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MCA102	Compulsory	Computer Organization and Design	3	1	0	4	60	20	20	0	0	

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Course Objectives:

- To create basic understanding of Computer System Organization.
- To understand basic concept of Computer System architecture.
- To understand internal working, structuring, and implementation of a computer system.

Course Outcomes: After completion of this syllabus students will be able

- To understand computer organization structure and behaviour of a computer system.
- To understand how exactly all the units in the system are arranged and interconnected.
- To understand functionalities of a Computer System Architecture in terms of instructions, addressing modes and registers.
- To understand internal working, structuring, and implementation of a computer system.

UNIT - I : Digital Computer and it types, Configuration(functional units) of Computer System, basic operational concepts, Capabilities, Limitations and applications of computers. Introduction of Number Systems like Binary, Octal and Hexadecimal number systems, Character Codes (BCD, ASCII, EBCDIC.

UNIT – **II**: Instruction formats, Instruction Cycle, Organization of Central Processing Unit, Hardwired & micro programmed control unit, Single Organization, General Register Organization, Addressing



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modes, data transfer & Manipulation, I/O Organization, Bus Architecture. Digital logic circuits: digital computer Logic gates, Boolean Algebra and its examples, K-map simplification.

UNIT – III Combinational circuit: Half Adder, Full Adder, concept of Flip-Flop. Digital components: integrated circuits, Decoders, Encoders, Multiplexer, De-multiplexers, Registers, Counters (synchronous & asynchronous), ALU, Micro Operation.

UNIT-IV Memory Organization: introduction to Memory units, memory Hierarchy design and its characteristics, types of main memory (RAM/ROM chips), types of RAM and ROM, Auxiliary memory (Hard Disk Drive), Associative memory, Cache memory, Virtual Memory.

UNIT-V Peripheral devices, I/O interface, Modes of Transfer, Priority Interrupt, Direct Memory Access, Input- Output Processor and Serial Communication. I/O Controllers, Asynchronous data transfer. Concept of 8-bit micro Processor (8085) and 16-bit Micro Processor (8086).

Text Books:

- 1. David Patterson and John Hennessy, Computer Organization and Design: The Hardware/Software Interface, RISC-V Edition, Morgan Kaufmann / Elsevier, 13th April 2017.
- 2. Stallings, Computer Organization & Architecture :Designing for performance, Tenth Edition, Pearson Education, 2016.
- 3. Carl Hamacher, Zvonko Vranesic, Safwat Zaky and Naraig Manjikian, Computer Organization and Embedded Systems, Sixth Edition, Tata McGraw Hill, 2012.

Reference Books:

- 1. John P. Hayes, Computer Architecture and Organization, Third Edition, Tata McGraw Hill, 2012.
- 2. John L. Hennessey and David A. Patterson, Computer Architecture A Quantitative Approach, Morgan Kaufmann / Elsevier Publishers, Fifth Edition, 2012.
- 3. William Stallings, Computer Organization and Architecture Designing for Performance, Eighth Edition, Pearson Education, 2010.



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MCA103	COMPULSORY	Internet Web Programming	3	1	4	6	60	20	20	30	20	

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Course Objectives:

- Provide an introduction to the fundamental concepts of HTML, CSS, XML, Javascript
- Learn CSS Grid Layout
- Develop basic programming skills using Javascript
- Develop skills in analyzing the usability of a website.
- Understand the principles of creating an effective Web Page.

Course Outcomes:

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes:

- Define the principle of Web page design.
- Define the basics of Javascript. तमसो मा ज्योतिगमय
- Visualize the basic concept of HTML.
- Recognize the elements of HTML.
- Introduce basics concept of CSS.
- Develop the concept of XML, XSLT, DTD and XPath.

UNIT - I

Java Methodology: Classes, Objects, Method, Inheritance, Packages, Abstract Classes, Interfaces, Exception Handling, Threads, Multithreading, String Handling, Streams and I/O, Applets.

UNIT – II

HTML: Introduction to HTML, HTML Documents structure tags, Text Formatting Tags, Inserting Special Characters, Anchor Tags, List Tags, Tables, Frames and Floating Frames, Developing Forms, Adding Images and Sound.



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UNIT – III

CSS: Concept of CSS, Creating Style Sheet, CSS Properties, CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, CSS Advanced (Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector), CSS Color, Creating page Layout and Site Designs.

UNIT-IV

XML: Creating XML documents, Working with elements, Working with attributes, Creating DTD to validate XML documents, Creating XSLT Stylesheet for formatting data, Using XPath functions

UNIT-V

Javascript: Introduction to Javascript, Identifier and Operator, Control Structure, Functions DOM, Numbers and String Functions, Arrays and Event handling in Javascript, Bootstrapping.

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List of Practical:

- 1.Develop a webpage using Form tag.
- 2. Develop a webpage using different HTML tags.
- 3.Develop a webpage using Table tag.
- 4. Develop a webpage using Frame tag.
- 5.Develop a static website using HTML tags.
- 6.Creating XML documents.
- 7. Creating DTD to validate XML documents.
- 8. Creating XSLT Stylesheet for formatting data.
- 9.Develop a Javascript Form.
- 10.Creating a Javascript POPUP Message.
- 11.Change Link colors using CSS
- 12.Create a TextBox using CSS
- 13. Center-Align elements using CSS
- 14 .Adjust padding using CSS
- 15.Make a Link Button using CSS

Text Books:

- 1. Jennifer Robbins ,"Learning Web Design: A beginner's guide to HTML, CSS, Javascript and Web Graphics", 5th Edition,Oreilly,2018
- 2. Doug Tidwell, "XSLT: Mastering XML Transformations", 2nd Edition, Oreilly, June 2009
- 3. Jon Duckett, "Javascript and Jquery: Interactive Front-End Web Development",1st Edition, Wiley, July 2014

Reference Books:



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- 2. Craig Granell ,"The Essential Guide to CSS and HTML Web Design", 3th Edition, Apress, March 2008
- 3. Jon Duckett, "HTML and CSS: Design and Build Websites", 1st Edition, Wiley, November 2011
- 4. Michael Kay," XSLT Programmer's Reference", Wrox Press Ltd, 1 April 2000

