Academic Year: 2023-2024

Master of Computer Application

Syllabus & Scheme

Semester – I & II

School of Computer Science

GYANVEER UNIVERSITY, SAGAR (M.P.)

## Scheme of Examination MCA I Semester (Major /Minor/Elective)

School of Computer Science (Academic Session 2023-24)

Subject wise distribution of marks and corresponding credits

S. No.	Subject Name	Subject Code	Paper Name	End Term Exam — FINAL EXAM	Internal Assesment I	Internal Assesment II	Internal Assesment III	Class test/ Interaction	Attendance	Practical/ Presentation / Lab Record	Viva Voce	Lab Work	Total Marks	L	T	P	Total Credits
					(Theory Slot — Internal Assesment Class test (Descriptive & Objective)/Assignment/Seminar/)			(Practical Slot — Internal Assesment)			(External Assesment)							
1	Core Course	MCA211T	Programming and Problem Solving Through "C-Language"	60	20	20	20	–	–	–	–	–	100	6	0	0	6
2	Core Course	MCA212T	COMPUTER ORGANIZATION AND ARCHITECTURE	60	20	20	20	–	–	–	–	–	100	6	0	0	6
3	Core Course	MCA213T	DISCRETE MATHEMATICAL STRUCTURE	60	20	20	20	–	–	–	–	–	100	6	0	0	6
4	Core Course	MCA214T	BUSINESS ENGLISH & COMMUNICATION	60	20	20	20	–	–	–	–	–	100	6	0	0	6
5	Core Course	MCA215P	LAB – I (PROG. LAB IN C)	–	–	–	–	10	10	20	10	50	100	0	0	2	2
6	Core Course	MCA216P	LAB – II (COMPUTER FUNDAMENTAL LAB)	–	–	–	–	10	10	20	10	50	100	0	0	2	2

Total Credit 6+6+6+6+2+2=28

Note Allotment of Marks for Internal Assesment for theory portion is Best of Two / either of two and addition of them
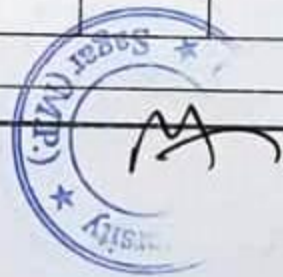
MCA –Semester –I
MCA211T - PROGRAMING & PROBLEM SOLVING THROUGH "C- LANGUAGE"

Objectives:

- General Knowledge of Programming types, Problem solving concepts. usage of Algorithm/ Flowchart.
- Writing, compiling and debugging programs in C language.
- Students will learn how to design structure of c programs, using tokens.
- Formatted and unformatted I/O, control statement and Looping. Design programs containing decision structures.

Course Content:

(Lecture-12)

Unit –I: Overview of Problem solving: Introduction to computer based Problem solving. Programming concepts with flowcharting and algorithms , classification of Programming languages, Programming environment {Assemblers, compilers, interpreters. linkers and loaders}. Developing and debugging flowcharts for programming problem.

(Lecture-12)

Unit - II: Fundaments of C programming: Overview of C - Various constructs of C program. coding style, data types, constants and variables, expressions and operators. basic input/output operations and formatting characters, decision making and branching. looping constructs, Arguments to main, Enumerations and bits fields, typedef, type casting. Storage class.

(Lecture-12)

Unit - III: Array and their Applications: Arrays {one dimensional and multidimensional array}. String Handling, Searching (Linear and binary) and sorting (selection. bubble. insertion) techniques, matrices operations.

(Lecture-12)

Unit - IV: Advanced Programming Concepts: Structures and union, Functions {Standard and User defined function, parameter passing, scope rules}, Recursion {Using recursion, conversion of recursive program to non-recursive}. Dynamic memory allocation and pointer {Uses, pitfalls, pointer to various user defined and standard data types}.

(Lecture-12)

Unit –V: More Advanced Programming Concepts: Pre-processors {define, include, macro's, ifdef...}.Introduction to file handling. Header files creation, introduction to Graphics.
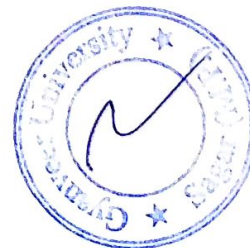
Learning Outcomes:

After completion of the course, the student

- Will have Knowledge of Programming types, Problem solving concepts, usage of Algorithm Flowchart.
- Writing, compiling and debugging programs in C language.
- Will know how to design structure of c programs, using tokens.
- Formatted and unformatted I/O, control statement and Looping. Design programs containing decision structures.

Required Text(s):

- B.W. Kerighan & D.M. Ritchie, The C programming Language, 2nd Edition Prentice Hall, 1998.
- Herbert Schildt, C++ The Complete Reference, 4th Edition McGraw-Hill 2000.
- Yashavant Kanetkar, Let Us C, 8th Edition, Infinity Science Press 2008.
- Ashok N. Kamthane, "Programming with ANSI and Turbo C", Pearson Education.

MCA SEMESTER – I
MCA212T - COMPUTER ORGANIZATION AND ARCHITECTURE

Objectives:

In the modern era, computer system is used in most aspects of life. You may use many different types of software on a computer system for particular applications ranging from simple document creation to space data processing. But, how does the Software is executed by the Computer Hardware? The answer to this basic question is contained in this Course.

Course Content:

(Lecture-12)

Unit-I

Information Representation: Number systems, BCD codes, error detecting and correcting codes. Binary arithmetic operations, Booths multiplication. Binary Logic: Boolean algebra, Boolean functions, truth tables, canonical and standard forms, simplification of Boolean functions, digital logic gates. Encoders, decoders, multiplexers, de-multiplexers and comparators.

(Lecture-12)

Unit -II

Memory organization: Secondary Memory, Primary Memory :Random access memory, Read Only memory basic cell of static and dynamic RAM, Building large memories using chips, Concept of segmentation & Paging, Associative memory, cache memory organization, virtual memory organization.

(Lecture-12)

UNIT-III

Architecture of a simple processor: A simple computer organization and instruction set, instruction formats, addressing modes, instruction cycle, instruction execution in terms of microinstructions, interrupt cycle ,concepts of interrupt and simple I/O organization. Synchronous & Asynchronous data transfer, Data Transfer Mode : Program Controlled, Interrupt driven, DMA(Direct Memory Access). Implementation of processor using the building blocks.

(Lecture-12)

UNIT-IV

Register Transfer Language and Micro-operations: concept of bus, data movement among registers, a language to represent conditional data transfer, data movement from/to memory. Design of simple Arithmetic & Logic Unit & Control Unit, arithmetic and logical operations Along with register transfer, timing in register transfer.

UNIT-V

Processor Design: -Processor Organization: General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, Program Control, Reduced Instruction Set Computer.

COURSE OUTCOMES:

After completion of the course, the student will be able to:
- design digital circuits by simplifying the Boolean functions.
- understand the organization and working principle of computer hardware components.
- understand mapping between virtual and physical memory.

Reference Books:

- Computer System Architecture, Morris Mano, PHI
- Computer Organization, Hamacher, MGH
- Computer Architecture, Carter, Schaum Outline Series, TMH
- System Architecture, Buad, VIKAS
- The Fundamentals of Computer Organization, Raja Rao, Scitech
- Computer Organization & Design, Pal Chowdhury, PHI

MCA SEMESTER – I
MCA213T- DISCRETE MATHEMATICAL STRUCTURE

Objectives: This is an introductory course in mathematics. This subject deals with the introduction to Set, Relation, Function Possets, Hasse Diagram and Lattice and Graph. The objectives of this Course are the student Know the theory and their application of Math function in computer. Solve the different types of problems by applying theory and appreciate the important application of mathematics in Computer.

Course Content:

(Lecture-12)

UNIT-I

Discrete Numeric function and Recurrence relation: Introduction to discrete numeric functions and generating functions introduction to recurrence relations and recursive algorithms, linear recurrence relations with constant coefficients, homogeneous solutions, particular solutions and total solutions

(Lecture-12)

UNIT-II

Sets, Relations and Functions: Sets, Subsets, Power sets, Complement, Union and Intersection, De-Morgan's law Cartesian products, Relations, relational matrices, properties of relations, equivalence relation, functions ,Injection, Surjection and Bijective mapping, Composition of functions, the characteristic functions and Mathematical induction.

(Lecture-12)

UNIT-III

Proportions & Lattices: Proposition & prepositional functions, Logical connections Truth- values and Truth Table, the algebra of prepositional functions-the algebra of truth values- Applications (switching circuits, Basic Computer Components).
Partial order set, Hasse diagrams, upper bounds, lower bounds, Maximal and minimal element, first and last element, Lattices, sub lattices, Isotonicity, distributive inequality, Lattice homomorphism, lattice isomorphism, complete lattice, complemented lattice distribution lattice.

(Lecture-12)

UNIT-IV

Groups: Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.

UNIT-V

Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs.

COURSE OUTCOMES:

At the end of the Course, the student will be:

- To understand, develop and solve mathematical Set theory.
- Able to design and solve Boolean functions for defined problems
- Apply the acquired knowledge of finite automata theory and design discrete problems to solve by computers.

Reference Books:

- J.P.Trembley & R.P.Manohar "Discrete Mathematical Structure with applications to
- Computer Science".
- Kenneth H. Rosen-203 "Discrete Math & its Applications" 5th ed.
- K.A. Ross and C.R.B. Writht "Discrete Mathematics ".
- Bernard Kolman & Robert C. Busby "Discrete Mathematical Structures for Computer
- Science"

MCA SEMESTER – I
MCA214T- BUSINESS ENGLISH & COMMUNICATION

Objectives: Communicate effectively (Verbal and Non Verbal). The Objectives: of this Course are the Develop interview skills and Develop Leadership qualities and essentials of the student.

Course Content:

(Lecture-12)

UNIT- I
Spoken Skills:
Spoken Skills Preparing for oral presentation, conducting presentations,
Listening: Barriers of Listening skill-Approaches to Listening –How to improve Listening exercises. Speaking: Paralanguage: Sounds, stress, intonation- Art of conversation –
Presentation skills – Public speaking- Expressing Techniques

(Lecture-12)

UNIT -II
Reading & Writing Skills:
Reading: Kinds of Reading – Causes of reading difficulties – Reading strategies – exercises. Writing: Effective writing – Paragraph ,Essay, Reports, Letters, Articles, Notices, Agenda & Minutes.

(Lecture-12)

UNIT- III
Communication:
Modes of Communication- Barriers – Interpersonal skills , Negotiation skills Non- Verbal communication – Etiquettes.

(Lecture-12)

UNIT- IV
Spoken Skills:
Group Dynamic skills: Group Discussion – Team building & Team work – Be a manager or leader – Decision making – creativity – Time & Stress management skills, Group Discussions. Group Discussions.

(Lecture-12)

UNIT -V
Media of Communication:
Interview skills: Types of Interviews – Preparing for interview – Preparing a CV Structuring the interview, Mock Interview Quick Tips. Telephonic Conversation; Negotiations.

Learning Outcomes:
After completion of the course, the student will be able to
- understand, develop and solve problem in Communication.
- Improve Skill for communication
- Discuss on audio-visual

Reference Books:

- Sanghi, Seema, Improve your communication skills. 2nd edition.
- Burnard, Philip. Interpersonal skills Training: A source book of activities. 2005.
- Ashley, Roderic. How to enhance your employability. 1998.
- Dr. Alex, K. Soft sill: know yourself & know the world. 2010.
- Cornerstone. Developing softskills. 4th edition 2005.
- Jones, Daniel. An outline of English phonetics.
- Aggarwal, Rohini. Business communication and Organization & Management.
- Grath. E.H. Basic Managerial skills for all.
- Maxwell, John C. Developing the leader within you.

MCA SEMESTER – I
MCA215P - C- Language Lab

Objectives:

- General Knowledge of Programming types, Problem solving concepts, usage of Algorithm/ Flowchart.
- Writing, compiling and debugging programs in C language.
- Students will learn how to design structure of c programs, using tokens.
- Formatted and unformatted I/O, control statement and Looping. Design programs containing decision structures.

1. Write a C program to find sum and average of three numbers.

2. Write a C program to find the sum of individual digits of a given positive integer.

3. Write a C program to generate the first n terms of the Fibonacci sequence.

4. Write a C program to generate prime numbers between 1 to n.

5. Write a C program to Check whether given number is Armstrong Number or Not.

6. Write a C program to evaluate algebraic expression (ax+b)/(ax-b)

7. Write a C program to check whether given number is perfect number or Not.

8. Write a C program to check whether given number is strong number or not.

9. Write a C program to find factorial of a given integer using non-recursive function.

10. Write a C program to find factorial of a given integer using recursive function.

11. Write C program to find GCD of two integers by using recursive function.

12. Write C program to find GCD of two integers using non-recursive function.

13. Write a C program to find both the largest and smallest number in a list of integers.

    a) Write a C Program to Sort the Array in an Ascending Order.

    b) Write a C program to perform addition of two matrices.

14. Write a C program that uses functions to perform Multiplication of Two Matrices.

15. Write a C Program to find whether given matrix is symmetric or not.

16. Write a C program to use function to insert a sub-string in to given main string from a given position.

17. Write a C program that uses functions to delete n Characters from a given position in a given string.

18. Write a C program using user defined functions to determine whether the given string is palindrome or not.

19. Write a C program that displays the position or index in the main string S where the sub string T begins, or - 1 if S doesn't contain T.

20. Write C program to count the number of lines, words and characters in a given text.

21. Write a C program to find the length of the string using Pointer.

    a) Write a C program to Display array elements using calloc( ) function.

22. Write a C Program to Calculate Total and Percentage marks of a student using structure.

MCA SEMESTER – I
MCA216P - Computer Fundamental – Lab

Objectives

- Applying the usage of system settings and window's features.

- Applying the Microsoft office word to create professional and academic documentation.
- Applying the basic function of MS-excel to prepare the worksheet.
- Applying the MS-Office power point to create the Power Point presentation
- Creating and editing database using MS-access.

Course Content:
Unit-I:

Introduction to Windows: Windows features including Control Panel and it's Components. Graphical features. Desktop setting with screensaver and wallpaper, Color. Background. Cut. Copy. Paste. Creating folder.

Unit-II
MS-WORD

Creating. Editing, Formatting: Font name, size, color, alignment. changing paragraph settings. Using Word Art ,Hyperlink, change case, spell checker. Mail Marge. Creating Tables. editing tables, alignment settings in tables

Unit-III
MS-EXCEL

Creating, Editing, Formatting: Font name, size, color, alignment, entering data. sorting data. Inserting, renaming and deleting Sheet, Inserting row, column, cell, picture. background. graph. symbol. applying formula in a cell, Call by Value, Call by Reference. hyperlink. object, diagram, Macro.

Unit-IV

Computer Fundamental
Identify various parts inside the CPU like motherboard, SMPS, ports. buses. IC chips. Processor. HDD, RAM etc.
Identify various I/O devices available in the lab physically.
Identify various parts of the computer by physical examination

Learning Outcomes:

After completion of the course, the student will be able to understand Microsoft office word to create professional and academic documentation.