



Eklavya University

SESSION

2023-24

M.C.A. I SEMESTER

SYLLABUS

OF

**Computer Application And Information
Technology Department**

School of Basic and Applied Sciences

EKLAHYA UNIVERSITY, DAMOH (M.P.)

Scheme of Examination MCA I Sem

For batch admitted in Academic Session 2023-24

Subject wise distribution of marks and corresponding credits

S.No.	Subject Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Periods Per week			Total Credits
			Theory Slot			Practical Slot			L	T	P	
			End Sem.	Mid term Examination	Quiz/ Assignment/ Attendance	End Sem	Lab Work/ sessional					
1	MCAPL20S101	FUNDAMENTAL OF COMPUTERS & EMERGING TECHNOLOGIES	60	30	10	-	-	100	3	1	0	4
2	MCAPL20S102	PROBLEM SOLVING USING C	60	30	10	-	-	100	3	1	-	4
3	MCAPL20S103	Principles of Management & Communication	60	30	10	-	-	100	3	1	-	4
4	MCAPL20S104	Discrete Mathematics	60	30	10	-	-	100	3	1	-	4
5	MCAPL20S105	COMPUTER ORGANIZATION & ARCHITECTURE	60	30	10	-	-	100	3	1	-	4
6	MCAPL20S106	PROBLEM SOLVING USING C LAB	-	-	-	120	80	200	-	-	8	8
7	MCAPL20S107	COMPUTER ORGANIZATION & ARCHITECTURE LAB	-	-	-	30	20	50	-	-	2	2
Total			300	150	50	150	100	750	15	5	10	30

Induction programme of three weeks (MC): Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations.

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Class		Master of Computer Application (MCA) I YEAR	
Semester/Year		I Semester	
Subject & Subject Code		FUNDAMENTAL OF COMPUTERS & EMERGING TECHNOLOGIES - MCAPL20S101	
Max. Marks		60	
Credit		Total Credits	
L	T	P	4
3	1	0	

Course Objectives:

1. Identify all the parts and main functions of computers.
2. Acquaint the students with the applications of computers and understanding latest trends in information technology.
3. Learn Basics of software Systems and Linux operating systems

Course Outcome:

1. Use and identify various part (input output devices) of computer system.
2. Explain functions of various parts and function of computer.
3. Use Linux operating system and create files and folders.
4. Explain Software Hardware Components of Computer system.

Student Learning Outcomes (SLO):

1. describes the computer and its general features
2. will be to able express basic computer hardwares
3. distinguish computer types and basic concepts
4. Knows the terms of motherboard, CPU, RAM, ROM, BIOS, CMOS and can express with their own words

Unit	Syllabus	Periods
UNIT - I	Introduction to Computer: Definition, Computer Hardware & Computer Software Components: Hardware – Introduction, Input devices, Output devices, Central Processing Unit, Memory- Primary and Secondary. Software - Introduction, Types – System and Application. Computer Languages: Introduction, Concept of Compiler, Interpreter & Assembler Problem solving concept: Algorithms – Introduction, Definition, Characteristics, Limitations, Conditions in pseudo-code, Loops in pseudo code.	8
UNIT - II	Operating system: Definition, Functions, Types, Classification, Elements of command based and GUI based operating system. Computer Network: Overview, Types (LAN, WAN and MAN), Data communication, topologies.	8
UNIT - III	Internet : Overview, Architecture, Functioning, Basic services like WWW, FTP, Telnet, Gopher etc., Search engines, E-mail, Web Browsers. Internet of Things (IoT): Definition, Sensors, their types and features, Smart Cities, Industrial Internet of Things.	8

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UNIT - IV	Block chain: Introduction, overview, features, limitations and application areas fundamentals of Block Chain. Crypto currencies: Introduction , Applications and use cases Cloud Computing: It nature and benefits, AWS, Google, Microsoft & IBM Services	8
UNIT - V	Emerging Technologies: Introduction, overview, features, limitations and application areas of Augmented Reality , Virtual Reality, Grid computing, Green computing, Big data analytics, Quantum Computing and Brain Computer Interface	8

Text Books : -

- 1 Discovering Computers 2016 - 1 st Ed. - Misty E. Vermaat; Susan L. Sebok; Steven M. Freund;
- 2 Jennifer T. Campbell; Mark Frydenberg (Shelly Cashman Series) - Cengage Learning

References Books:

- 1 Rajaraman V., "Fundamentals of Computers", Prentice-Hall of India.
- 2 Norton P., "Introduction to Computers", McGraw Hill Education.
- 3 Goel A., "Computer Fundamentals", Pearson.
- 4 Balagurusamy E., " Fundamentals of Computers", McGraw Hill 5. Thareja R., Fundamentals of Computers", Oxford University Press.

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Class		Master of Computer Application (MCA) I YEAR	
Semester/Year		I Semester	
Subject & Subject Code		PROBLEM SOLVING USING C - MCAPL20S102	
Max. Marks		60	
Credit		Total Credits	
L	T	P	4
3	1	0	
Course Objectives:			
<p>1. Have Understanding of Programming Language Standards, Problem Solving Techniques, IDE and Compilers for C.</p> <p>2. To have in depth knowledge of Writing, Compiling and Running Programs.</p> <p>3. To understand and Practice Programming Construct: Variable, Operators, Control Structures, Loop, Functions with C .</p> <p>4. To understand and Practice basics of arrays, pointers, preprocessor, Structure and Union</p> <p>5. To learn difference in procedural programming language with understanding features and Practice beginner level of Pointers, Preprocessor, Programming</p>			
Course Outcome:			
<p>The Students will be able to:</p> <p>1. List and Demonstrate Basic Terminology Used in Computer Programming Write, Compile and Debug Programs in C Language.</p> <p>2. Understand and Apply Variable, Conditional Statements, Loops, Functions in C .</p> <p>3. Practice Pointers, Structure, Union and Class in Programming.</p> <p>4. Explain and Differentiate the Process of Problem Solving Using Procedural Programming Language.</p> <p>5. Understand and Practice Object Oriented Programming Concepts in C++.</p>			
Student Learning Outcomes (SLO):			
<p>Students will:</p> <p>1. explain how an existing c program works</p> <p>2. discover errors in a C program and describe how to fix them</p> <p>3. critique a C program and describe ways to improve it</p> <p>4. analyze a problem and construct a C program that solves it</p> <p>5. choose and apply the required Linux commands to develop C programs in a command-line environment</p>			
Unit	Syllabus		Periods
UNIT - I	<p>Basics of programming: Approaches to problem solving, Use of high level programming language for systematic development of programs, Concept of algorithm and flowchart, Concept and role of structured programming</p> <p>Basics of C: History of C, Salient features of C, Structure of C Program, Compiling C Program, Link and Run C Program, Character set, Tokens, Keywords, Identifiers, Constants, Variables, Instructions, Data types, Standard Input/Output, Operators and expressions.</p>		8

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UNIT - II	<p>Conditional Program Execution: if, if-else, and nested if-else statements, Switch statements, Restrictions on switch values, Use of break and default with switch, Comparison of switch and if-else.</p> <p>Loops and Iteration: for, while and do-while loops, Multiple loop variables, Nested loops, Assignment operators, break and continue statement.</p> <p>Functions: Introduction, Types, Declaration of a Function, Function calls, Defining functions, Function Prototypes, Passing arguments to a function Return values and their types, Writing multifunction program, Calling function by value, Recursive functions.</p>	8
UNIT - III	<p>Arrays: Array notation and representation, Declaring one-dimensional array, Initializing arrays, Accessing array elements, Manipulating array elements, Arrays of unknown or varying size, Two-dimensional arrays, Multidimensional arrays.</p> <p>Pointers: Introduction, Characteristics, * and & operators, Pointer type declaration and assignment, Pointer arithmetic, Call by reference, Passing pointers to functions, array of pointers, Pointers to functions, Pointer to pointer, Array of pointers.</p> <p>Strings: Introduction, Initializing strings, Accessing string elements, Array of strings, Passing strings to functions, String functions.</p>	8
UNIT - IV	<p>Structure: Introduction, Initializing, defining and declaring structure, Accessing members, Operations on individual members, Operations on structures, Structure within structure, Array of structure, Pointers to structure.</p> <p>Union: Introduction, Declaring union, Usage of unions, Operations on union.</p> <p>Enumerated data types Storage classes: Introduction, Types- automatic, register, static and external.</p>	8
UNIT - V	<p>Dynamic Memory Allocation: Introduction, Library functions – malloc, calloc, realloc and free. File Handling: Basics, File types, File operations, File pointer, File opening modes, File handling functions, File handling through command line argument, Record I/O in files. Graphics: Introduction, Constant, Data types and global variables used in graphics, Library functions used in drawing, Drawing and filling images, GUI interaction within the program.</p>	8

Text Books : –

- 1 Kerninghan & Ritchie "The C Programming Language", PHI
- 2 Schildt "C: the Complete Reference", 4th Ed TMH
- 3 Kanetkar Y. "Let Us C", BPB.
- 4 Kanetkar Y.: "Pointers in C", BPB

References Books:

- 1 Kanetkar Y., "Let Us C", BPB Publications.
- 2 Hanly J. R. and Koffman E. B., "Problem Solving and Program Design in C", Pearson Education
- 3 Schildt H., "C- The Complete Reference", McGraw-Hill.
- 4 Goyal K. K. and Pandey H.M., "Trouble Free C", University Science Press
- 5 Gottfried B., "Schaum's Outlines- Programming in C", McGraw-Hill Publications.
- 6 Dey P. and Ghosh M., "Computer Fundamentals and Programming in C", Oxford University Press.

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Class		Master of Computer Application (MCA) I YEAR	
Semester/Year		I Semester	
Subject & Subject Code		Principles of Management & Communication - MCAPL20S103	
Max. Marks		60	
Credit		Total Credits	
L	T	P	4
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Course Objectives:

1. To enable the students to study the evolution of Management,
2. To study the functions and principles of management.
3. To learn the application of the principles in an organization.
4. To enable the effective and barriers communication in the organization
5. To study the system and process of effective controlling in the organization.

Course Outcome:

1. Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, and have same basic knowledge on international aspect of management.
2. To understand the planning process in the organization.
3. To understand the concept of organization.
4. To analysis isolate issues and formulate best control methods.

Student Learning Outcomes (SLO):

1. demonstrate an understanding of current and relevant management knowledge.
2. identify and define the managerial function.
3. employ writing skills that are compatible with standards in business.
4. demonstrate the ability to communicate his/her ideas and opinions in a clear and logical form.

Unit	Syllabus	Periods
UNIT - I	Management: Need, Scope, Meaning and Definition. The process of Management, Development of Management thought F.W. Taylor and Henry Fayol, Horrothorne Studies, Qualities of an Efficient Management.	8
UNIT - II	Planning & Organising: Need, Scope and Importance of Planning, Steps in planning, Decision making model. Organising need and Importance, Organisational Design, Organisational structure, centralisation and Decentralisation, Delegation.	8
UNIT - III	Directing & Controlling: Motivation—Meaning, Importance, need. Theories of Motivation, Leadership—meaning, need and importance, leadership style, Qualities of effective leader, principles of directing, Basic control process, Different control Techniques.	8
UNIT - IV	Introduction to Communication: What is Communication, Levels of communication, Barriers to communication, Process of Communication, Non-verbal Communication, The flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group) Communication, Technology Enabled communication, Impact of Technology, Selection of appropriate communication Technology, Importance of Technical communication.	8

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UNIT - V	Business letters : Sales & Credit letters; Claim and Adjustment Letters; Job application and Resumes. Reports: Types; Structure, Style & Writing of Reports. Technical Proposal: Parts; Types; Writing of Proposal; Significance. Nuances of Delivery; Body Language; Dimensions of Speech: Syllable; Accent; Pitch; Rhythm; Intonation; Paralinguistic features of voice; Communication skills, Presentation strategies, Group Discussion; Interview skills; Workshop; Conference; Seminars.	8
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Text Books : -

- 1 TB1. Stephen P. Robbins & Mary Coulter, "Management", 10th Edition, Prentice Hall (India) Pvt. Ltd., 2009.
- 2 TB2. JAF Stoner, Freeman R.E and Daniel R Gilbert "Management", 6th Edition, Pearson Education, 2004.

References Books:

- 1 P.C. Tripathi, P.N. Reddy, "Principles of Management", McGraw Hill Education 6th Edition.
- 2 C. B. Gupta, "Management Principles and Practice", Sultan Chand & Sons 3rd edition.
- 3 T.N.Chhabra, "Business Communication", Sun India Publication.
- 4 V.N.Arora and Laxmi Chandra, "Improve Your Writing", Oxford Univ. Press, 2001, New Delhi.
- 5 Meenakshi Raman & Sangeeta Sharma, "Technical Communication- Principles and Practices", Oxford Univ. Press, 2007, New Delhi.
- 6 Koontz Harold & Weihrich Heinz, "Essentials of Management", McGraw Hill 5th Edition 2008.
- 7 James A. F., Stoner, "Management", Pearson Education Delhi.

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Semester/Year		I Semester	
Subject & Subject Code		Discrete Mathematics - MCAPL20S104	
Max. Marks		60	
Credit		Total Credits	
L	T	P	4
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Course Objectives:

1. Introduce concepts of mathematical logic for analyzing propositions and proving theorems
2. Use sets for solving applied problems, and use the properties of set operations algebraically.
3. Work with relations and investigate their properties.
4. Investigate functions as relations and their properties.
5. Introduce basic concepts of graphs, digraphs and trees.

Course Outcome:

1. Apply the Operations of Sets and use Venn Diagrams to Solve Applied Problems.
2. Analyze Properties of Algebraic Structures Such as Groups, Rings and Fields.
3. Use and Analyze Recursive Definitions
4. Analyze Modern Problems in Computer Science and solve them Using Graphs and Trees.

Student Learning Outcomes (SLO):

1. Verify the correctness of an argument using symbolic logic and truth tables. Construct proofs using direct proof, proof by contradiction, and proof by cases, or mathematical induction.
2. Solve problems using counting techniques and combinatorics.
3. Perform operations on discrete structures such as sets, functions, relations or sequences.
4. Solve problems involving recurrence relations and generating functions.
5. Construct functions and apply counting techniques on sets in the context of discrete probability.
6. Apply algorithms and use definitions to solve problems to proof statements in elementary number theory.

Unit	Syllabus	Periods
UNIT - I	Set Theory: Introduction, Size of sets and Cardinals, Venn diagrams, Combination of sets, Multisets, Ordered pairs and Set Identities. Relation: Definition, Operations on relations, Composite relations, Properties of relations, Equality of relations, Partial order relation. Functions: Definition, Classification of functions, Operations on functions, Recursively defined functions.	8
UNIT - II	Posets, Hasse Diagram and Lattices: Introduction, Partial ordered sets, Combination of Partial ordered sets, Hasse diagram, Introduction of lattices, Properties of lattices – Bounded, Complemented, Modular and Complete lattice. Boolean Algebra: Introduction, Axioms and Theorems of Boolean algebra, Boolean functions. Simplification of Boolean functions, Karnaugh maps, Logic gates.	8
UNIT - III	Propositional: Propositions, Truth tables, Tautology, Contradiction, Algebra of Propositions, Theory of Inference and Natural Detection. Predicate Logic: Theory of Predicates, First order predicate, Predicate formulas, Quantifiers, Inference theory of predicate logic.	8

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UNIT - IV	Algebraic Structures: Introduction to algebraic Structures and properties. Types of algebraic structures: Semi group, Monoid, Group, Abelian group and Properties of group. Subgroup, Cyclic group, Cosets, Permutation groups, Homomorphism and Isomorphism of groups. Rings and Fields: Definition and elementary properties of Rings and Fields.	8
UNIT - V	Natural Numbers: Introduction, Pano's axioms, Mathematical Induction, Strong Induction and Induction with Nonzero Base cases. Recurrence Relation & Generating functions: Introduction and properties of Generating Functions. Simple Recurrence relation with constant coefficients and Linear recurrence relation without constant coefficients. Methods of solving recurrences. Combinatorics: Introduction, Counting techniques and Pigeonhole principle, Polya's Counting theorem.	8

Text Books : -

- 1 C.L Liu- Elements of Discrete Mathematics McGraw Hill
- 2 K.H.Rosen, Discrete Mathematics and Applications s, Fifth Edition 2003
- 3 Judith L. Gersting -Mathematical Structures for Computer Science

References Books:

- 1 Kenneth H. Rosen, "Discrete Mathematics and Its Applications", McGraw Hill, 2006.
- 2 B. Kolman, R.C Busby and S.C Ross, "Discrete Mathematics Structures", Prentice Hall ,2004.
- 3 R.P Girimaldi, "Discrete and Combinatorial Mathematics", Addison Wesley, 2004.
- 4 Y.N. Singh, "Discrete Mathematical Structures", Wiley- India, First edition, 2010.
- 5 Swapankumar Sarkar, "A Textbook of Discrete Mathematics", S. Chand & Company PVT.
- 6 Krishnamurthy, "Combinatorics Theory & Application", East-West Press Pvt. Ltd., New Delhi.
- 7 Liptschutz, Seymour, "Discrete Mathematics", McGraw Hill.

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UNIT - V	Input / Output: Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors. Serial Communication: Synchronous & asynchronous communication, standard communication interfaces.	8
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Text Books : -

- 1 Computer System Architecture Third Edition, by Mano M. Morris, Pearson Education India
- 2 Digital Design by Mano M. Morris, Pearson Education India

References Books:

- 1 Computer Organization and Design
- 2 Computer Organization" by Zvonco Vranesic and Safwat Zaky,

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Class		Master of Computer Application (MCA) I YEAR	
Semester/Year		SEMESTER — I	
Subject & Subject Code		COMPUTER ORGANIZATION & ARCHITECTURE – CAPL20S107	
Max. Marks		50 [30+20]	
Credit		Total Credits	
L	T	P	2
0	0	2	

PRACTICAL LIST

1. Implementing HALF ADDER, FULL ADDER using basic logic gates.
2. Implementing Binary -to -Gray, Gray -to -Binary code conversions.
3. Implementing 3-8 line DECODER. Implementing 4x1 and 8x1 MULTIPLEXERS.
4. Verify the excitation tables of various FLIP-FLOPS.
5. Design of an 8-bit Input/ Output system with four 8-bit Internal Registers.
6. Design of an 8-bit ARITHMETIC LOGIC UNIT.
7. Design the data path of a computer from its register transfer language description.
8. Design the control unit of a computer using either hardwiring or microprogramming based on its register transfer language description.
9. Implement a simple instruction set computer with a control unit and a data path.

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