

FIRST SEMESTER

Name of the Program	Master of Computer Application (MCA)			Year/ Semester:	I / I	
Course Name	Fundamentals of Computers and Programming using C Language	Course Code:	MCA0101T	Type:	Theory	
Credits	03			Total Sessions Hours:	45 Hours	
Evaluation Spread	Internal Continuous Assessment:	30 Marks		End Term Exam:	70 Marks	
☐ Core	☐ Major	☐ Minor	☐ Elective	☐ Co-curricular	☐ Vocational	
Course Objectives	1. To learn basics of Computer fundamentals, memory and number systems. 2. To introduce the basic concepts like variable, datatypes, operators, decision making and looping statement along with arrays. 3. To learn functions, structure and union. 4. To learn advanced programming concepts of C language.					
Course Outcomes (CO): After the successful course completion, learners will develop following attributes:						
Course Outcome (CO)	Attributes					
CO1	Understand basics of Computer fundamentals, Memory, I/O Devices and software.					
CO2	Understand the basic concepts of C programming language and able to identify the need and use of programming in real world.					
CO3	Use functions, pointers, array and string using C language.					
CO4	Design and develop programs utilizing advance C programming concepts like structure, union, pre-processor and enumeration etc.					
Pedagogy	Interactive, discussion-bases, student-centered, presentation.					
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks					
Session Details	Topic				Hours	Mapped CO
Unit 1	Introduction to Computer: Definition, Block Diagram of Computer, Characteristics of Computer, Classification of Computers, History of Computers, Generation of Computers, Applications of computer. Memory: Memory Unit, Primary Memory, Secondary Memory. Input devices- Keyboard, Mouse, Scanners, Output Devices- Monitors, Size, Resolution, Refresh Rate, Types of Printers, Plotter, Sound Card and Speakers. Software Concepts: Definition, System Software, Application Software, Utility Package. Programming Languages: Concept, Classification of languages, and introduction to Compiler, Interpreter, and Assembler.				11	CO1
Unit 2	Overview of C Language: Introduction, Salient features of C, Structure of C programs. C Language Fundamentals: Character set, Data type and sizes, Execution and Compilation of C programs. Operators and Expressions: Various type of operators used in C language. Types of expression, Precedence and associativity of expression.				12	CO2

	Structure of C program: - Compilation and execution. Various type of Input and Output function. Formatted input and Outputs function. Control Statements: if, if-else, Nested if else, else if ladder, Switch statement, Break, Continue, goto statement. Loops: Introduction, for loop, while loop, do-while loop, Nesting of loops. Arrays: Defining of Array, Types of Array, initialization and declarations. String: Character Arrays, Arrays and strings, String Manipulation.		
Unit 3	Functions: Built-in and user-defined function, Types of user defined function, Function prototype declaration, Function call, and function definition, Recursive functions, Array and functions. Storage Classes (static, automatic, register, extern). Pointers: Introduction, Pointer operators (&, *), Parameter passing: Call by value, Call by reference, Pointer to Pointer, Dynamic Memory Allocation: calloc () and malloc () functions.	11	CO3
Unit 4	Structure and Union: Defining structure and union, Declaration and initialization of structure and union variables, Differences between structure and union, enumeration. File Handling: Sequential file, Direct File, open (), fprintf (), fscanf (), reading mode file, writing and append mode file, opening Direct file, reading and writing of direct file, seekg (), seekp () functions.	11	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	2					1	1		
CO2	2	3	3	1	1	3	2	2	2	1	1	1
CO3	3	2	2	3	1	2		1	1	3	1	1
CO4	2	3	3	2		3	1		2	3	1	

Strong contribution-3, Average contribution-2, Low contribution-1,

Suggested Readings:

Text- Books	1. V. Rajaraman, "Fundamentals of Computers", PHI 2. Peter Norton's, "Introduction to Computers", TMH 3. Yashwant Kanitkar, "Let us C", BPB. 4. Gottfried, "Programming in C", Schaum's Series, Tata McGraw Hill.
Reference Books	1. D.S. Yadav, "Foundation of Information Technology", New Age International. 2. Programming in ANSI C, Balaguruswamy, Tata McGraw-Hill, 4th Edition, 2008. 3. Kernigham, Ritchie, "The C Programming Language", PHI, 1977, India, New Delhi. 4. Pointers in C, Yashwant Kanetkar, BPB Publication, 3rd Edition, 2003.
e-Learning	https://www.tutorialspoint.com/computer_fundamentals/index.htm https://www.geeksforgeeks.org/c-programming-language/ https://onlinecourses.nptel.ac.in/noc22_cs40/preview https://onlinecourses.swayam2.ac.in/cec19_cs06/preview

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	Section A: Contains 05 MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries 01 Marks. Section B: Contains 02 descriptive questions and each question carries 2 marks. Section C: Contains 04 descriptive questions out of which 03 questions are to be attempted. Each question carries 05 Marks. <i>50% of the marks obtained in the mid semester examination will be added to the internal assessment.</i>

Quiz Test	04	Contains 04 descriptive questions . Each question carries 01 Mark.
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	30	

Course created by:

Signature:

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Name of the Program	Master of Computer Application (MCA)			Year/ Semester:	I / I	
Course Name	Fundamentals of Computers and Programming using C Language Lab	Course Code:	MCA0101P	Type:	Practical	
Credits	01			Total Sessions Hours:	30 Hours	
Evaluation Spread	Internal Continuous Assessment:	15 Marks		End Term Exam:	35 Marks	
☒ Core	☐ Major	☐ Minor	☐ Elective	☐ Co-curricular	☐ Vocational	
Course Objectives	1. To identify basic components of the computer system. 2. To introduce the basic concepts like variable, datatypes, operators of C language. 3. To learn decision making and looping statement along with arrays. 4. To learn functions, structure and union. 5. To learn advanced programming concepts of C language.					
Course Outcomes (CO): After the successful course completion, learners will develop following attributes:						
Course Outcome (CO)	Attributes					
CO1	Explain basics of Computer fundamentals, Memory, I/O Devices and software.					
CO2	Create programs to exhibit basic data types, variables, operations, conditional and looping statement using the C language.					
CO3	Demonstrate the concept of functions, pointers, array and string using C programs.					
CO4	Implement advanced C programming concepts like structure, union, and file handling etc.					
Pedagogy	Interactive, discussion-bases, student-centered, presentation.					
Internal Evaluation Mode	• Mid-term Practical Examination: 08 Marks • Viva-Voce: 04 Marks • Practical File - 03 Marks					
Session Details	Topic				Hours	Mapped CO
Unit 1	1. Write C program to find largest of three integers. 2. Write C program to find factorial of an integer. 3. Write C program to check whether the given string is palindrome or not. 4. Write C program to find Sum of Digits of an integer & Product of digits of an integer. 5. Write C program to find whether the given integer is: A prime number. 6. Write C program for Pascal triangle.				06	CO1
Unit 2	1. Write C program to find sum and average of n integers using linear array. 2. Write C program to perform addition, multiplication, transpose on matrices. 3. Write C program to find factorial of n by recursion using user defined functions. 4. Write a C program to sort a Linear Array of number by Bubble Sort and Selection Sort. 5. Write C program to perform following operations by using user defined functions: Concatenation. 6. Write C program to find sum of n terms of series: $n - n*2/2! + n*4/4! + \dots$				08	CO2
Unit 3	1. Write C program to interchange two values using: Call by value. 2. Write C program to interchange two values using: Call by reference.				08	CO3

	3. Write a C program for searching an integer in a linear array using Linear Search. 4. Write a C program for searching an integer in a linear array using Binary Search. 5. Write C program to sort the list of integers using dynamic memory allocation. 6. Write C program to display the mark sheet of a student using structure.		
Unit 4	1. Write C program to perform following operations on data files: 2. Read from data file (Sequential & Direct File). 3. Write to data file (Sequential & Direct File). 4. Write C program to copy the content of one file to another file using command line argument. 5. Write the Programs to print some pattern using star (*). 6. Write the Programs to print some pattern using Digits (1,2,3.....). 7. Write the Programs to print some pattern using Alphabets, Digits and Star.	08	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	2		2	1		1	1		
CO2	2	2	1	1	1	3		1	2	2	1	2
CO3	3	3	2	3	1	2	1		1	2	1	1
CO4	3	3	3	2		3		1	2	3	2	2

Strong contribution-3, Average contribution-2, Low contribution-1,

Suggested Readings:

Text- Books	1. V. Rajaraman, "Fundamentals of Computers", PHI 2. Yashwant Kanitkar, "Let us C", BPB. 3. Gottfried, "Programming in C", Schaum's Series, Tata McGraw Hill.
Reference Books	1. Programming in ANSI C, Balaguruswamy, Tata McGraw-Hill, 4th Edition, 2008. 2. Kernigham, Ritchie, "The C Programming Language", PHI, 1977, India, New Delhi. 3. Computer Today, Suresh Basandra, Galgotia Publication, 1st edition, 2010.
e-Learning	https://www.geeksforgeeks.org/c-programming-language/ https://onlinecourses.nptel.ac.in/noc22_cs40/preview https://www.tutorialspoint.com/computer_fundamentals/index.htm https://onlinecourses.swayam2.ac.in/cec19_cs06/preview

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	08	Section A: Contains 03 practical questions out of which 02 questions are to be attempted. Each question carries 04 Marks .
Attendance	03	Will be decided by subject teacher
Viva-Voce	04	As per policy
Total Marks	15	

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Name of the Program	Master of Computer Application (MCA)			Year/ Semester:	I / I	
Course Name	Operating System	Course Code:	MCA0102T	Type:	Theory	
Credits	04			Total Sessions Hours:	60 Hours	
Evaluation Spread	Internal Continuous Assessment:	30 Marks		End Term Exam:	70 Marks	
☒ Core	☐ Major	☐ Minor	☐ Elective	☐ Co-curricular	☐ Vocational	
Course Objectives	1. To introduce the generic structure of an Operating System 2. To detail the concepts of Processes, Threads and Synchronization principles 3. To explain the students about the Memory Management, Protection 4. To provide an idea of different File Systems and I/O					
Course Outcomes (CO): After the successful course completion, learners will develop following attributes:						
Course Outcome (CO)	Attributes					
CO1	Know different OS types and basic component of OS Architecture.					
CO2	Analyze issues in process management and evaluations of various scheduling algorithms.					
CO3	Understand memory management, paging and trashing.					
CO4	Understand and apply office automation tools.					
Pedagogy	Interactive, discussion-bases, student-centered, presentation.					
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks					
Session Details	Topic				Hours	Mapped CO
Unit 1	Introduction: Evolution of operating systems, Types of operating systems, Different Views of the Operating System, System Components and Services, System Calls, System Programs, Operating System Structure, Layered Operating Systems, Monolithic Systems, Virtual Machines. Processes and Threads: Process Concept, Process State, Process Control Block, Context Switching, Process Scheduling, Cooperating Processes, Threads, Multithreading Models, Thread Libraries, Threading Issues.				15	CO1
Unit 2	CPU Scheduling: Scheduling Criteria, Scheduling algorithms, Multiple-Processor Scheduling, Real-Time Scheduling. Inter-process Communication and Synchronization: Need for Inter-Process Synchronization, Critical Section, Concept of Semaphores, Classical Problems in Concurrent Programming, Dining Philosopher’s Problem, Bounded Buffer Problem, Readers and Writers Problem, Critical Region Monitors and Messages.				15	CO2
Unit 3	Deadlock: Concepts of Deadlock Characterization, Deadlock Prevention, Deadlock Avoidance. Banker’s Algorithm, Detection and Recovery from Deadlock.				15	CO3

	Memory Management: Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation with Paging.											
Unit 4	Virtual Memory Management: Demand Paging and its performance, Page Replacement Algorithms, Allocation of Frames, and Thrashing. File Management: File Concept, File Type, File Access Methods, File Attributes, File Operation, Disk Scheduling. Case Studies: WINDOWS and LINUX /UNIX Operating System.									15	CO4	
CO-PO and PSO Mapping												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	1	1	3	2		2		2	1	2		
CO2	3	2	2	1	1	3	1	1	2	1	1	1
CO3	1	2	3	3		2	2	3	2	2	2	1
CO4	2	3	3	2	1	3		2	3	3	2	2
Strong contribution-3, Average contribution-2, Low contribution-1,												
Suggested Readings:												
Text- Books	1. Silberschatz, Galvin and Gagne, “Operating System Concepts”, 10th Edition, John Wiley & Sons Inc. 2. Sibsankar Haldar, Alex A.Aravind, “Operating systems”, 2 nd Edition, Pearson Education.											
Reference Books	1. Harvey M Deital, “Operating System”, Addison Wesley. 2. Tannenbaum, “Operating System”, TMH											
e-Learning	• https://www.tutorialspoint.com/operating_system/os_overview.htm • https://onlinecourses.swayam2.ac.in/cec20_cs06/preview											
Recapitulation & Examination Pattern												
Internal Continuous Assessment:												
Component	Marks	Pattern										
Mid Semester	12	Section A: Contains 05 MCQs/Fill in the blanks/One Word Answer/True-False type of questions. Each question carries 01 Marks . Section B: Contains 02 descriptive questions and each question carries 2 marks. Section C: Contains 04 descriptive questions out of which 03 questions are to be attempted. Each question carries 05 Marks . <i>50% of the marks obtained in the mid semester examination will be added to the internal assessment.</i>										
Quiz Test	04	Contains 04 descriptive questions . Each question carries 01 Mark .										
Assignment	05	Assignment to be made on topics and instruction given by subject teacher										
Presentation	05	Presentation to be made on topics and instruction given by subject teacher										
Attendance	04	As per policy										
Total Marks	30											

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Name of the Program	Master of Computer Application (MCA)			Year/ Semester:	I / I	
Course Name	Advanced Software Engineering	Course Code:	MCA0103T	Type:	Theory	
Credits	04			Total Sessions Hours:	60 Hours	
Evaluation Spread	Internal Continuous Assessment:	30 Marks		End Term Exam:	70 Marks	
☒ Core	☐ Major	☐ Minor	☐ Elective	☐ Co-curricular	☐ Vocational	
Course Objectives	1. To understand the essentials of software engineering. 2. To understand the various software development models. 3. To identify the key elements of software design process. 4. To explain the function of each element of a memory hierarchy.					
Course Outcomes (CO): After the successful course completion, learners will develop following attributes:						
Course Outcome (CO)	Attributes					
CO1	Apply theoretical foundation of software engineering in practical software development					
CO2	Discuss the software life cycle models					
CO3	Identify the importance of the software development process					
CO4	Apply software engineering practices to create complex software designs					
Pedagogy	Interactive, discussion-bases, student-centered, presentation.					
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks					
Session Details	Topic				Hours	Mapped CO
Unit 1	Introduction to software engineering: define software engineering, software process, software engineering practices Software process models: software development life cycle (SDLC), classical software development lifecycle model, prototyping model, V model, incremental Model, introduction to agile method of software development				14	CO1
Unit 2	Requirement engineering: requirement engineering, requirement eliciting/gathering, negotiating requirement, validating requirement, requirement analysis, stakeholder analysis Requirement specification: software requirement specification document, characteristics of a good SRS, functional and non-functional requirement				16	CO2
Unit 3	Design: design process, design concepts, coupling, cohesion, data flow diagram (DFD), flow chart, architectural design, component-based design, object-oriented design, class-based components, use case diagram, class diagram, activity diagram User interface design: golden rules, interface design models, interface design process, interface design activities				15	CO3
Unit 4	Software testing: test design, test planning, test case definition, Testing strategies: black box testing, white box testing, sanity testing, smoke testing				15	CO4

	Testing levels: unit testing, integration testing, system testing, acceptance testing, regression testing Software maintenance: software maintenance, software supportability, reengineering, business process reengineering, software reengineering, restructuring, economics of reengineering											
CO-PO and PSO Mapping												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	2		1	2	1			
CO2	3	3	3		1	3		1	2	1	1	1
CO3	2	3	2	2	2	2	2	2	2	2	1	1
CO4	2	2	2		2	3		2		3		
<i>Strong contribution-3, Average contribution-2, Low contribution-1,</i>												
Suggested Readings:												
Text- Books		1. R. Pressman, “Software Engineering”, TMH. 2. Pankaj Jalote, “An Integrated Approach to Software Engineering”, Narosa										
Reference Books		1. Pankaj Jalote, “Software Project Management in Practice”, Pearson Education.										
e-Learning		• https://www.tutorialspoint.com/software_engineering/index.htm • https://nptel.ac.in/courses/106105182										
Recapitulation & Examination Pattern												
Internal Continuous Assessment:												
Component			Marks	Pattern								
Mid Semester			12	Section A: Contains 05 MCQs/Fill in the blanks/One Word Answer/True-False type of questions. Each question carries 01 Marks . Section B: Contains 02 descriptive questions and each question carries 2 marks. Section C: Contains 04 descriptive questions out of which 03 questions are to be attempted. Each question carries 05 Marks . <i>50% of the marks obtained in the mid semester examination will be added to the internal assessment.</i>								
Quiz Test			04	Contains 04 questions . Each question carries 01 Mark .								
Assignment			05	Assignment to be made on topics and instruction given by subject teacher								
Presentation			05	Presentation to be made on topics and instruction given by subject teacher								
Attendance			04	As per policy								
Total Marks			30									

Course created by:

Signature:

Approved by:

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Name of the Program	Master of Computer Application (MCA)			Year/ Semester:	I / I	
Course Name	Computer organization and architecture	Course Code:	MCA0104T	Type:	Theory	
Credits	04			Total Sessions Hours:	60 Hours	
Evaluation Spread	Internal Continuous Assessment:	30 Marks		End Term Exam:	70 Marks	
☐ Core	☐ Major	☐ Minor	☐ Elective	☐ Co-curricular	☐ Vocational	
Course Objectives	1. To have a thorough understanding of the basic structure and operation of a digital computer. 2. Remember and understand the basics of computer architecture, organization and Design. 3. An ability to understand the functions of various hardware components and their building blocks 4. In depth understanding of Central Processing Unit & I/O organization.					
Course Outcomes (CO): After the successful course completion, learners will develop following attributes:						
Course Outcome (CO)	Attributes					
CO1	Understand the fundamentals of a digital computer system.					
CO2	Learn basic computer organization and design.					
CO3	Learn organization of computer memory and access methods.					
CO4	Understand the architecture of a basic computer, its registers, bus system and the interaction flow among them.					
Pedagogy	Interactive, discussion-bases, student-centered, presentation.					
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks					
Session Details	Topic				Ho urs	Mapped CO
Unit 1	Basic of Digital Electronics: Introduction to logic gates. Primary Gates, Derived gate, Universal Gate, Boolean Algebra, Logical expression: Canonical and standard forms, Reducing the SOP/POS expression using Algebraic & K- map methods up to four variables, don't care conditions. Combinational Logic: Combinational circuits, binary adder- subtractor, introduction to decoders, encoders, multiplexers, de-multiplexers. Sequential logic: Sequential circuits, synchronous and asynchronous, flip flops, RS, D, JK, T, Master slave flip flop.				18	CO1
Unit 2	Basic Computer Organization and Design: Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference instructions, input-output and interrupt. Memory Unit: Introduction of computer memory classification, Concepts of auxiliary, Associative, Cache And Virtual Memory, Direct Memory Access (DMA): Introduction, DMA Transfer modes , sequential access, direct access storage devices.				15	CO2

Unit 3	Control Design: Fundamental Concepts (Register Transfers, Performing of arithmetic or logical operations, Fetching a word from memory, storing a word in memory), Execution of a complete instruction, Hardwired Control, Micro programmed control (Microinstruction, Microprogram sequencing, Microinstruction with Next-address field, Prefetching Microinstruction).	15	CO3
Unit 4	Processor Design: Processor Organization: General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, Program Control, RISC & CICS Architecture. Input-Output Organization: I/O Interface, Modes of transfer, Interrupts & Interrupt handling, Programmed I/O, Input-Output processor, Serial Communication.	12	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	2		3	2	3		2	1	1		1
CO2	1	2	2	2	1	2	1	1	2	2	1	
CO3	3	3	2	2	3	2		3	2	2		1
CO4	2	2		3	2	3	1	2	2	1	1	

Strong contribution-3, Average contribution-2, Low contribution-1,

Suggested Readings:

Text- Books	1. M. Mano, "Computer System Architecture", Pearson Education, New Jersey, 2017, 3rd Ed. 2. W. Stallings, "Computer Organization and Architecture Designing for Performance", Prentice Hall of India, 2015, Tenth Edition.
Reference Books	1. M. Mano, "Digital Design", Pearson Education, New Jersey, 2018, Sixth Edition.
e-Learning	• https://www.javatpoint.com/digital-electronics • https://onlinecourses.swayam2.ac.in/cec21_cs16/preview

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	Section A: Contains 05 MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries 01 Marks. Section B: Contains 02 descriptive questions and each question carries 2 marks. Section C: Contains 04 descriptive questions out of which 03 questions are to be attempted. Each question carries 05 Marks. 50% of the marks obtained in the mid semester examination will be added to the internal assessment.
Quiz Test	04	Contains 04 descriptive questions . Each question carries 01 Mark .
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	30	

Course created by:

Signature:

Approved by:

Signature:

Name of the Program	Master of Computer Application (MCA)			Year/ Semester:	I / I	
Course Name	Computer Network	Course Code:	MCA0105T	Type:	Theory	
Credits	04			Total Sessions Hours:	60 Hours	
Evaluation Spread	Internal Continuous Assessment:	30 Marks		End Term Exam:	70 Marks	
☐ Core	☐ Major	☒ Minor	☐ Elective	☐ Co-curricular	☐ Vocational	
Course Objectives	1. To build an understanding of the fundamental concepts of computer networking. 2. To familiarize the student with the basic taxonomy and terminology of the computer networking. 3. To get familiar with transmission media and network topologies. 4. To understand the OSI model and its layers.					
Course Outcomes (CO): After the successful course completion, learners will develop following attributes:						
Course Outcome (CO)	Attributes					
CO1	Understand basic computer network technology.					
CO2	Understand and explain Data Communications System and its components.					
CO3	Identify the different types of network topologies and protocols.					
CO4	Enumerate the layers of the OSI model and TCP/IP and explain the function(s) of each layer.					
Pedagogy	Interactive, discussion-bases, student-centered, presentation.					
Internal Evaluation Mode	Mid-term Examination: 12 Marks Attendance: 04 Marks Quiz Test: 04 Marks Assignment: 05 Marks Presentation: 05 Marks					
Session Details	Topic				Hours	Mapped CO
Unit 1	Introduction to Computer Networks: Basics of Computer Networks, Features of Network, types of Network, Network Topologies, and benefits of Networking. Data Communication: Characteristics of Data Communication, Components of Data Communication, Data communication channels, Data Communication Types/Data Flow, Data Transmission Mode: Serial and Parallel Transmission.				15	CO1
Unit 2	OSI & TCP/IP Models: Open System Interconnection (OSI) Reference Model, Transmission Control Protocol/Internet Protocol (TCP/IP) Model, TCP Operation, User Datagram Protocol (UDP) Operation, Congestion Control Algorithm, Flow Control (Leaky Bucket Algorithm). Network Addressing: Physical Address - MAC Address, Logical Address - IPv4 Addressing System, IPv6 Addressing System, Sub-netting.				15	CO2

Unit 3	Data Link Layer Design Issues: Providing Services to Network Layer, Framing, Error Control, and Flow Control. Switching Techniques: Message Switching, Circuit Switching, Packet Switching and Forwarding, Networking Devices: Hub, Switch, Routers, Repeater, Modem, Network Interface Card (NIC).	15	CO3
Unit 4	Network Protocols: Address Resolution Protocol (ARP), Domain Name System (DNS), Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), Remote Administration Protocols: TELNET and Secure Shell (SSH).	15	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	2		3	2	3		2	1	1		1
CO2	1	2	2	2	1	2	1	1	2	2	1	
CO3	3	3	2	2	3	2		3	2	2		1
CO4	2	2		3	2	3	1	2	2	1	1	

Strong contribution-3, Average contribution-2, Low contribution-1,

Suggested Readings:

Text- Books	1. B. A. Forouzan, "Data Communication and Networking", Tata McGraw Hill. 2. S. Tannenbaum (2003), Computer Networks, 4th edition, Pearson Education/ PHI, New Delhi, India.
Reference Books	1. W. Stallings, "Data and Communication", Prentice Hall of India.
e-Learning	https://www.javatpoint.com/computer-network-tutorial https://onlinecourses.swayam2.ac.in/cec19_cs07/preview

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Mid Semester	12	Section A: Contains 05 MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries 01 Marks . Section B: Contains 02 descriptive questions and each question carries 2 marks. Section C: Contains 04 descriptive questions out of which 03 questions are to be attempted. Each question carries 05 Marks . 50% of the marks obtained in the mid semester examination will be added to the internal assessment.
Quiz Test	04	Contains 04 descriptive questions . Each question carries 01 Mark .
Assignment	05	Assignment to be made on topics and instruction given by subject teacher
Presentation	05	Presentation to be made on topics and instruction given by subject teacher
Attendance	04	As per policy
Total Marks	30	

Course created by:
Signature:

Approved by:
Signature:

Name of the Program	Master of Computer Application (MCA)			Year/ Semester:	I / I	
Course Name	Mathematical Methods	Course Code:	MCAB0101	Type:	Theory	
Credits	--			Total Sessions Hours:	60 Hours	
Evaluation Spread	Internal Continuous Assessment:	50 Marks		End Term Exam:	-	
☒ Core	☐ Major	☐ Minor	☐ Elective	☐ Co-curricular	☐ Vocational	
Course Objectives	1. To learn basics of mathematics. 2. To introduce the basic concepts of set theory. 3. To learn Cartesian co ordinate system. 4. To learn central tendency and fundaments of probability.					
Course Outcomes (CO): After the successful course completion, learners will develop following attributes:						
Course Outcome (CO)	Attributes					
CO1	Able to calculate rank of matrix, inverse of the matrix & use the concept of matrix to find the solution of system of linear equations.					
CO2	Understand the basics of set theory.					
CO3	Understand the Cartesian co ordinate system, basic formulae of plane geometry and different forms of equation of straight line.					
CO4	Learn the measures of central tendency and basic concepts of probability.					
Pedagogy	Interactive, discussion-bases, student-centered, presentation.					
Internal Evaluation Mode	Internal Examination: 35 Marks Assignment: 15 Marks					
Session Details	Topic				Hours	Mapped CO
Unit 1	Definition of different types of matrix, Algebraic operations, Symmetric & skew symmetric matrix, Transpose of matrix, Orthogonal matrices, Rank of matrix, Determinant of a square matrix, Inverse of a square matrix, Solution of Linear Equations by Cramer’s Rule, Eigen values & Eigen vectors of a square matrix.				08	CO1
Unit 2	Set Theory: Introduction, Combination of sets, Multisets, Ordered pairs. Proofs of some general identities on sets. Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality of relations, Order of relations. Functions: Definition, Classification of functions, Operations on functions, Recursively defined functions.				07	CO2
Unit 3	Coordinates, Section formula, Distance formula, Slope or gradient of straight line, Conditions for parallelism and perpendicularity of two lines, Slope of a line joining two points, Slopeintercept form of a straight line, normal form of a straight line.				08	CO3
Unit 4	Measures of central Tendency – Mean, Median, Mode, Measures of Dispersion-Standard deviation and Coefficient of variance. Probability-Sample space and events, Definition of probability, Elementary properties of probability.				07	CO4

CO-PO and PSO Mapping												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	2					1	1		
CO2	2	3	3	1	1	3	2	2	2	1	1	1
CO3	3	2	2	3	1	2		1	1	3	1	1
CO4	2	3	3	2		3	1		2	3	1	
Strong contribution-3, Average contribution-2, Low contribution-1,												
Suggested Readings:												
Text- Books	1. 12th N.C.E.R.T. Book. 2. Probability theory and random process by S.P. Eugene Xavier, S. Chand & company Pvt. Ltd 3. Mathematics and statistics by Ajay Goyal, Taxman Allied Service Pvt. Ltd.											
Reference Books	1. Differential calculus by Shanti Narayan, S. Chand.											
e-Learning	https://nptel.ac.in/courses/122104018/ https://nptel.ac.in/courses/111104085											
Recapitulation & Examination Pattern												
Internal Continuous Assessment:												
Component	Marks	Pattern										
Internal Examination	35	Section A: Contains 07 MCQs/Fill in the blanks/One Word Answer/True-False type of questions. Each question carries 01 Marks. Section B: Contains 04 descriptive questions and each question carries 2 marks. Section C: Contains 05 descriptive questions out of which 04 questions are to be attempted. Each question carries 05 Marks.										
Assignment	15	Assignment to be made on topics and instruction given by subject teacher										
Total Marks	50											

Course created by:
Signature:

Approved by:
Signature:

Name of the Program	Master of Computer Application (MCA)			Year/ Semester:	I / I	
Course Name	Professional Communication and Personality Enhancement	Course Code:	MCA0106T	Type:	Theory	
Credits	02			Total Sessions Hours:	30 Hours	
Evaluation Spread	Internal Continuous Assessment:	30 Marks		End Term Exam:	70 Marks	
☒ Core	☐ Major	☐ Minor	☐ Elective	☐ Co-curricular	☐ Vocational	
Course Objectives	1. To provide an overview of prerequisites to Basic Communication. 2. To gain insights for effective and advanced writing skills. 3. To provide an outline to Personality Development, Teamwork, Leadership Skills, Time Management. 4. To underline the importance of advanced presentation skills.					
Course Outcomes (CO): <i>After the successful course completion, learners will develop following attributes:</i>						
Course Outcome (CO)	Attributes					
CO1	Basic Understanding of Communication and Professional Communication.					
CO2	Basic knowledge of structural and functional grammar. Learning Language through literature.					
CO3	To develop Personality Development, Teamwork, Leadership Skills, Time Management.					
CO4	Understanding the basic and advanced presentation skills.					
Pedagogy	Interactive, discussion-bases, student-centered, presentation.					
Internal Evaluation Mode	Internal Examination 20 Marks Assignment: 10 Marks Presentation: 20 Marks					
Session Details	Topic				Hours	Mapped CO
Unit 1	Effective Reading Skills: Active Reading Strategies: Ways to improve Efficiency of Reading, Skimming and Scanning Note Making and Précis Writing: Linear Note-Making & Patterned Note- Taking				08	CO1
Unit 2	Effective and Advance Writing Skills: Pre-Interview Preparation: Resume writing, Covering letter, Letter Writing and Paragraph Writing Skills: Writing and, Developing of paragraph, Adaptive Writing for Different Audiences.				07	CO2
Unit 3	Personality Development: Personality Development, Teamwork, Leadership Skills, Time Management, Verbal, Non-Verbal Communication, Communication Styles and Listening Skills				08	CO3
Unit 4	Advanced Presentation Skills: Presentation strategies: Purpose, Audience and locale analysis, Organizing contents, Audio-Visual aids, Nuances of Delivery, Body language, Voice dynamics.				07	CO4

CO-PO and PSO Mapping												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	2					1	1		
CO2	2	3	3	1	1	3	2	2	2	1	1	1
CO3	3	2	2	3	1	2		1	1	3	1	1
CO4	2	3	3	2		3	1		2	3	1	
Strong contribution-3, Average contribution-2, Low contribution-1,												
Suggested Readings:												
Text- Books		1. Sanghi, Seema, Improve your communication skills. 2nd edition. 2. Dr. Alex, K. Soft skill: know yourself & Know the world. 3. Aggarwal, Rohini. Business communication and Organization & Management.										
Reference Books		1. Maxwell, John C. Developing the leader within you										
Recapitulation & Examination Pattern												
Internal Continuous Assessment:												
Component		Marks	Pattern									
Mid Semester		12	Section A: Contains 05 MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries 01 Marks . Section B: Contains 02 descriptive questions and each question carries 2 marks. Section C: Contains 04 descriptive questions out of which 03 questions are to be attempted. Each question carries 05 Marks . 50% of the marks obtained in the mid semester examination will be added to the internal assessment.									
Quiz Test		04	Contains 04 descriptive questions . Each question carries 01 Mark .									
Assignment		05	Assignment to be made on topics and instruction given by subject teacher									
Presentation		05	Presentation to be made on topics and instruction given by subject teacher									
Attendance		04	As per policy									
Total Marks		30										