

University of Engineering and Management



INSTITUTE OF ENGINEERING & MANAGEMENT, NEWTOWN

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR



DEPARTMENT OF COMPUTER APPLICATIONS

DETAILED SYLLABUS BOOKLET –

1ST SEMESTER – MCA – 2025 BATCH

Syllabus Structure

1st Year 1st Semester

Course Code	Course Title	Total No. of Contact Hours				Total No. of Credits
		Lecture (L)	Tutorial (T)	Practical (P)	Total Hours	
Bridge Course						
MCA001	Bridge Course - English	0	0	0	0	0
MCA002	Bridge Course - Introduction to C Programming	0	0	0	0	0
MCA003	Bridge Course - Basic Mathematical Computation	0	0	0	0	0
1 st Semester (Theory)						
MCA101	Computer Organization and Architecture	3	1	0	4	3
MCA102	Computer Programming with C	3	1	0	4	4
MCA103	Data Structures with C	3	1	0	4	4
MCA104	Discrete Mathematical Structure	3	1	0	4	3
MCA105	Business English and Communication	3	1	0	4	3
MCA(GS)101	Mental Maths for Professionals - I	2	0	0	2	0.5
Total of Theory					22	17.5
1 st Semester (Practical)						
MCA192	C Programming Laboratory	0	0	3	3	3
MCA193	Data Structures with C Laboratory	0	0	3	3	3
Total of Practical					9	9
1 st Semester (Sessional)						
MCA(GS)181	Competitive Aptitude Training - I	2	0	0	2	0.5
MCA171	Research Methodology and IPR	2	0	0	2	2
MAR	Mandatory Additional Requirements (Co-Curricular/Extra-Curricular Activity)	0	0	0	0	0
IFC	Industry and Foreign Certification	0	0	0	0	0
MOOCS	Massive Open Online Courses	0	0	0	0	0
Total of Sessional					2	0.5
Total of Semester					33	27



**University of Engineering and Management
Institute of Engineering & Management, New Town Campus**

University of Engineering & Management, Jaipur

1st Semester Syllabus for MCA Admission Batch 2025



**University of Engineering and Management
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2025, 1st Semester**



Subject Name: Computer Organisation and Architecture

Credit: 4

Subject Code: MCA101

Lecture Hours: 40

Name of the Course: Computer Organization and Architecture

Course Code: MCA101 & MCA191	Semester: 1st
Duration: 40 Hrs.	Maximum Marks: 100
Teaching Scheme	Examination Scheme
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Practical: 2	Practical Sessional Internal continuous evaluation: 100
Credit: 4+2	Practical Sessional external examination: 100

Aim:	
Sl. No.	
1	To have a thorough understanding of the basic structure and operation of a digital computer.
2	To study the different communication methods with I/O devices and standard I/O interfaces.
3	To learn the architecture and assembly language programming of 8085 microprocessor.
Objective:	
Sl. No.	
1	Understanding Logic gates, flip flops and counter.
2	Clear Understanding of Computer Architecture.
3	Clear Understanding of Pipeline processing, RISC and CISC architectures.

4	Develop a base for advanced microprocessors.
Pre-Requisite:	
Sl. No.	
1.	Proficiency in basic Digital Electronics
Course Outcome:	
1.	Summarize the fundamental components of a basic computer system and its organization.
2.	Apply arithmetic and logical microoperations of binary number systems.
3.	Analyze control unit design and concept of pipelining.
4.	Classify memory hierarchy and examine numerical problems based on it.
Relevant Links:	
COA LinkedIn Learning Link COA Coursera Link COA NPTEL Link	

CO-PO-PSO Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	3	-	-	-	-	-	2	-	2	-	-	-
CO2	3	2	2	2	-	-	1	-	-	2	-	2	-	-	-
CO3	2	2	3	3	-	-	1	-	-	2	-	2	-	-	-
CO4	3	2	3	2	-	-	-	-	-	2	-	2	-	-	-

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	Structure of Computers and Computer Arithmetic	Computer types, Functional units, Basic operational concepts, von Neumann Architecture, Bus Structures, Software, Performance, Multiprocessors and Multicomputer, Data representation, Fixed and Floating point, Error detection and correction codes Addition and Subtraction, Multiplication and Division algorithms, Floating-point Arithmetic Operations, Decimal arithmetic operations.	International Academia: https://web.stanford.edu/dept/registrar/bulletin_past/bulletin02-03/pdf/CompSci.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	4

2	Basic Computer Organization and Design	Instruction codes, Computer Registers, Computer Instructions and Instruction cycle. Timing and Control, Memory-Reference Instructions, Input-Output and interrupt. Central processing unit: Stack organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Complex Instruction Set Computer (CISC) Reduced Instruction Set Computer (RISC), CISC vs RISC	International Academia: https://web.stanford.edu/dept/registrar/bulletin_past/bulletin02-03/pdf/CompSci.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	8
3	Register Transfer, Micro-Operations and Micro-Programmed Control	Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-Operations, Logic Micro-Operations, Shift Micro-Operations, Arithmetic logic shift unit, Control Memory, Address Sequencing, Micro-Program example, Design of Control Unit.	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	8
4	Memory System:	Memory Hierarchy, Semiconductor Memories, RAM(Random Access Memory), Read Only Memory (ROM), Types of ROM, Cache Memory, Performance considerations, Virtual memory, Paging, Secondary Storage, RAID.	International Academia: https://web.stanford.edu/dept/registrar/bulletin_past/bulletin02-03/pdf/CompSci.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	7

5	Input-Output:	I/O interface, Programmed IO, Memory Mapped IO, Interrupt Driven IO, DMA.	International Academia: https://web.stanford.edu/dept/registrar/bulletin_past/bulletin02-03/pdf/CompSci.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	7
6	MULTIPROCESSORS	Characteristics of multiprocessors, Interconnection structures, Inter Processor Arbitration, Interprocessor Communication and Synchronization, and Cache Coherence.	International Academia: https://web.stanford.edu/dept/registrar/bulletin_past/bulletin02-03/pdf/CompSci.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	6

List of Books Text Books:			
Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
M. Moris Mano	Computer System Architecture	3 rd Ed	Pearson/PHI
Reference Books: 1. Carl Hamacher, Zvonks Vranesic, SafeaZaky (2002), Computer Organization, 5th edition, McGraw Hill, New Delhi, India.			



University of Engineering and Management
Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2025, 1st Semester



Subject Name: Computer Programming with C

Credit: 4

Subject Code: MCA102

Lecture Hours: 40

Name of the Course: Computer Programming with C	
Course Code: MCA102 & MCA192	Semester: 1st
Duration: 40 Hrs.	Maximum Marks: 100
Teaching Scheme	Examination Scheme
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Practical: 2	Practical Sessional Internal continuous evaluation: 100
Credit: 4+2	Practical Sessional external examination: 100

Aim:	
Sl. No.	
1	To gain Knowledge of Various aspects of algorithm development
2	To enhance Ability to identify qualities of a good solution
3	To implement learned algorithm design techniques and data structures to solve problems.
Objective:	
Sl. No.	
1	The fundamental design, analysis, and implementation of basic data structures.
2	Basic concepts in the specification and analysis of programs.
3	Principles for good program design, especially the uses of data abstraction.
4	Significance of algorithms in the computer field
Pre-Requisite:	
Sl. No.	
1.	Proficiency in one high level programming language
Course Outcome:	
1.	will be able to develop simple applications in C using basic constructs
2.	will be able to design and implement applications in C using Arrays and Strings
3.	will be able to design and implement applications in C using Functions and Pointers
4.	will be able to develop applications in C using Structures and Students will be able to design applications using sequential and random-access file processing.
Relevant Links:	
C Study Material C NPTEL LINK C Coursera Link C LinkedIn Learning Link	

CO-PO-PSO Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	3	0	0	0	1	1	0	2	3	1	1
CO2	3	3	3	1	3	0	0	0	1	1	0	2	3	1	1
CO3	3	3	3	1	3	0	0	0	1	1	0	2	3	1	1
CO4	3	3	3	1	3	0	0	0	1	1	0	2	3	1	1

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
1	Basics of 'C' Programming	Fundamentals of algorithms: Notion of algorithm, Notations used for assignment statements and basic control structures. Introduction to 'C': General structure of 'C' program, Header file, 'main ()' function. Fundamental constructs of 'C': Character set, tokens, keywords, Identifiers, Constants - number constants, character constants, string constants, Variables. Data types in	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry	6	

		'C': Declaring variables, data type conversion. Basic Input and Output functions: input and output statements using printf(), scanf() functions. Assignments and expressions: simple assignment statements, arithmetic operators, shift operators, bitwise operators, sizeof operator	standards		
2	Control structures	Conditional statements: Relational operators, logical operators, if statement, if-else statements, nested if-else statements, if-else ladder, switch statement. Looping statements: while loop, do-while loop, for loop. Branching Statements: goto statement, use of 'break' and 'continue' statements.	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	6	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. metrics from the console, verifies if metrics multiplication is possible or not. Then multiplies the metrics and prints the 3rd metrics. 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 the algebraic expression $(ax+b)/(ax-b)$. 7. Write a C program to check if the given number is perfect number? 8. Write a C program to check if given number is strong number? 9. Write a program to print your name without using any semicolon in the program. 10. Write a program to convert temperature in Celsius to Fahrenheit and vice-versa.

					11. Write a C program to check whether a number is Palindrome or not. 12. Write a C program to find maximum between two numbers. 13. Write a C program to find maximum between three numbers. 14. Write a C program to check whether a number is negative, positive or zero. 15. Write a C program to check whether a number is divisible by 5 and 11 or not within the range 100 to 500. 16. Write a C program to check whether a number is even or odd. 17. Write a C program to check whether a year is a leap year or not. 18. Write a C program to check whether a character is alphabet or not. 19. Write a C program to input any alphabet and check whether it is vowel or consonant. 20. Write a C program to input any character and check whether it is an alphabet, digit or special character.
3	Arrays and structure	3.1 Characteristics of an array, One dimension and two dimensional arrays, concept of multi-dimensional arrays. 3.2 Array declaration and Initialization. 3.3 Operations on Arrays. 3.4 Character and String input/output and String related operations. 3.5 Introduction and Features of Structures, Declaration and Initialization of Structures, array of structures. 3.6 Type def, Enumerated Data Type	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf	8	1. Write a program to store marks for n number of student in an array and print their marks. 2. Write a program which stores the marks of subject Mathematics and English of n number of students in an array and then prints their individual total marks. 3. Write a program to insert an element in an array in a particular position. 4. Write a program to delete an element from a particular position of an array. 5. Write a program to convert a decimal number taken as input from user to corresponding binary number and store the result in an array.

			Industry Mapping: The concepts delivered are in sync with the industry standards	6. Write a program to input a binary number in an array and convert into corresponding decimal number. 7. Write a program to find the smallest and the largest elements in an array. 8. Write a program for deleting duplicate elements in an array. 9. Write a program to search for a particular element in an array. 10. Write a program to sort n elements (ascending order). 11. Write a program to find second highest number from the array without using sorting. 12. Write a program to perform addition and subtraction between two matrices. 13. Write a program to transpose a matrix. 14. Write a program to add the elements of each row and each column of a matrix. 15. Write a program to perform the multiplication of two matrices. 16. Write a program to check whether a matrix is identity matrix or not. 17. Write a program to check whether a matrix is sparse matrix or not 18. Write a C program to create a structure named company which has name, address, phone and no Of Employee as member variables. Read name of company, its address, phone and no Of Employee. Finally display these members" value. 19. Define a structure "complex" (typedef) to read two complex numbers and perform addition, subtraction of these two complex numbers and display the result. 20. Write a C program to read Roll No, Name,
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					Address, and Age marks of 12 students in the BCT class and display the details from the function.
4	Functions	Concept and need of functions. Library functions: Math functions, String handling functions, other miscellaneous functions such as getchar(), putchar(), malloc(), calloc(). Writing User-defined functions - function definition, functions declaration, function call, scope of variables - local variables, global variables. Function parameters: Parameter passing- call by value & call by reference, function return values, function return types, declaring function return types, The 'return' statement. Recursive functions.	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	6	1. Write a C program to add, subtract, multiply and divide two integers using a user-defined type function with return type. 2. Write a C program to calculate sum of first 20 natural numbers using recursive function. 3. Write a C program to generate Fibonacci series using recursive function. 4. Write a C program to swap two integers using call by value and call by reference methods of passing arguments to a function. 5. Write a C program to find sum of digits of the number using Recursive Function. 6. Write a C program to read an integer number and print the reverse of that number using recursion. 7. Write a C program to find maximum and minimum between two numbers using functions. 8. Write a C program to check whether a number is even or odd using functions. 9. Write a C program to check whether a number is prime, Armstrong or perfect number using functions. 10. Write a C program to find power of any number using recursion.
5	Pointers	Introduction to Pointers: Definition, use of pointers, '*' and '&' operators, declaring, initializing, accessing pointers. Pointer arithmetic. Pointer to array.	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed	8	1. Write a C program to find the sum of all the elements of an array using pointers. 2. Write a C program to swap value of two variables using pointer. 3. Write a C program to add two numbers using pointers.

		Pointer and Text string. Function handling using pointers. Pointers to structure.	syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf Industry Mapping: The concepts delivered are in sync with the industry standards		4. Write a C program to input and print array elements using pointer. 5. Write a C program to copy one array to another using pointer. 6. Write a C program to swap two arrays using pointers. 7. Write a C program to reverse an array using pointers. 8. Write a C program to search for an element in array using pointers. 9. Write a C program to add two 2 X 2 matrix using pointers. 10. Write a C program to multiply two 2 X 2 matrix using pointers. 11. Write a C program to find length of string using pointers. 12. Write a C program to copy one string to another using pointer. 13. Write a C program to concatenate two strings using pointers. 14. Write a C program to compare two strings using pointers. 15. Write a C program to find a substring from a given string using pointers.
6	File handling	Creation of the new file Opening an existing file Reading from the file Writing to the file Deleting the file	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://www.aicte-india.org/downloads/mcadegree.pdf	6	1. Write a C Program to list all files and sub-directories in a directory. 2. Write a C Program to count number of lines in a file. 3. Write a C Program to print contents of file. 4. Write a C Program to copy contents of one file to another file. 5. Write a C Program to merge contents of two files into a third file. 6. Write a C program to delete a file.

			Industry Mapping: The concepts delivered are in sync with the industry standards		
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List of Books Text Books:			
Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
E.Balagurusamy	Programming in ANSI C	7 th Ed	McGraw Hill Education
Reference Books: Let us C by <i>Yashavant Kanetkar</i> , 19th Edition., The C Programming Language by <i>Brian W. Kernighan</i> and <i>Dennis Ritchie</i> , 2 nd Edition Mastering C by <i>K. R. Venugopal</i>			



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University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2025, 1st Semester



Subject Name: Data Structure with C

Credit: 4

Code: MCA103

Lecture Hours: 40

Name of the Course: Data Structure with C	
Course Code: MCACC103 & MCACC193	Semester: 1st
Duration: 40 Hrs.	Maximum Marks: 100
Teaching Scheme	Examination Scheme
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Practical: 2	Practical Sessional Internal continuous evaluation: 100
Credit: 4+2	Practical Sessional external examination: 100

Aim:	
Sl. No.	
1	To gain Knowledge of Various aspects of algorithm development
2	To enhance Ability to identify qualities of a good solution
3	To implement learned algorithm design techniques and data structures to solve problems.
Objective:	
Sl. No.	
1	The fundamental design, analysis, and implementation of basic data structures.
2	Basic concepts in the specification and analysis of programs.
3	Principles for good program design, especially the uses of data abstraction.
4	Significance of algorithms in the computer field
Pre-Requisite:	
Sl. No.	
1.	Proficiency in one high level programming language
Course Outcome:	
1.	On completion of this course students are expected to learn various data structures, their usages, merits and limitations.
2.	On completion of this course students are expected to design and analyze various algorithms.
3.	On completion of this course students are expected to do a comparative analysis among different data structures and decide on the appropriate data structure to be used in a given scenario.
4.	On completion of this course students are expected to acquire adequate knowledge and skills to solve a real life software problem.
Relevant Links:	
DS Study Material DS NPTEL LINK DS Coursera Link DS LinkedIn Learning Link	

CO-PO-PSO Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	1	2	-	-	-	-	-	-	1	1	2	2
CO2	3	3	1	2	1	-	-	-	-	-	-	2	3	2	1
CO3	3	2	2	3	2	-	-	-	-	-	-	1	3	2	1
CO4	2	2	3	2	2	-	-	-	-	-	-	2	3	2	2

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
1	Algorithm Concept	Algorithm concept, Time Complexity, Space Complexity, Running Time– Worst Case, Best Case, Average Case, time space trade-off, Algorithm Efficiency- Linear loops, Logarithmic loops, Nested loops, Time complexity comparison- Polynomial vs Exponential, Algorithm Notations- Big O , Big Omega, Theta Notation	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://makautexam.net/aicte_details/Syllabus/MCA/sem221.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	4	

2	Introduction to Data Structure, Array	Program Efficiency, Data Structure-definition, usage, examples, Selection of Appropriate Data Structure, Data Structure-some terminologies, Classification of Data Structure, Fundamental difference between Linear and Non-linear Data Structure with examples, Operations on Linear Data Structure Introduction to Linear Data Structure-Array, 1D, 2D arrays, Row/Column major representation, sparse matrix	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://makautexam.net/aicte_details/Syllabus/MCA/se_m221.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	8	1. Write a C program to print an array. 2. Write a C program to check whether a given string is Palindrome or not. 3. Write a C program to convert temperature from degree Centigrade to Fahrenheit. 4. Write a C program to sort an array. 5. Write a C program to print the largest and second largest element of the array. 6. Write a C program to display Fibonacci series. 7. Write a program that reads two 2D metrics from the console, verifies if metrics multiplication is possible or not. Then multiplies the metrics and prints the 3rd metrics. 8. Write a program that reads a 2D metrics and checks if the metrics is a symmetric metrics or not. 9. Write a C program to print reverse array 10. Write a C program to check the sum of all elements of an array 11. Write a C program to check duplicate number in an array. 12. Write a C program to read a 2D array (with most of the elements as 0s) and then represent the same array as Sparse Metrics. 13. Write a C program to pass an array to a function using Call by Value, update the array values in the function, print the array elements both in the function and in the calling function. 14. Write a C program to pass an array to a function using Call by Reference, update the array values in the function, print the array elements both in the function and in the calling function. 15. Write a program to display n number of
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					elements. Memory should be allocated dynamically using malloc(). 16. Write a program to display n number of elements. Memory should be allocated dynamically using calloc(). 17. Write a program to allocate memory using malloc() and then reallocate the previously allocated memory using realloc(). Display the elements which have been taken after reallocation. 18. Write a program to allocate memory using calloc() and then reallocate the previously allocated memory using realloc(). Display the elements which have been taken after reallocation. 19. Write a C program to search an element in an Array using dynamic memory allocation
3	Linear Data Structure-Linked List	Linked List-Introduction, Representation, Memory Allocation, Types- Singly, circular, doubly, doubly & circular, Operations on various linked lists-Count, Traverse/Display, Search, Insert, Delete	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://makautexam.net/aicte_details/Syllabus/MCA/se_m221.pdf Industry Mapping: The concepts delivered are in sync with the industry standards	8	1. Write a Menu driven C program to accomplish the following functionalities in single linked list. a) Create a single linked list. b) Display the elements of a single linked list. c) Insert a node at the beginning of a single linked list. d) Insert a node at the end of a single linked list. e) Insert a node before a given node of a single linked list. f) Insert a node after a given node of a single linked list. g) Delete a node from the beginning of a single linked list. h) Delete a node from the end of a single linked list. i) Delete a node after a given node of a single

				linked list. j) Delete the entire single linked list. 2. Write a Menu driven C program to accomplish the following functionalities in circular linked list. a) Create a circular linked list. b) Display the elements of a circular linked list. c) Insert a node at the beginning of a circular linked list. d) Insert a node at the end of a circular linked list. e) Delete a node from the beginning of a circular linked list. f) Delete a node from the end of a circular linked list. g) Delete a node after a given node of a circular linked list. h) Delete the entire circular linked list. 3. Write a Menu driven C program to accomplish the following functionalities in doubly linked list. a) Create a doubly linked list. b) Display the elements of a doubly linked list. c) Insert a node at the beginning of a doubly linked list. d) Insert a node at the end of a doubly linked list. e) Insert a node before a given node of a doubly linked list. f) Insert a node after a given node of a doubly linked list. g) Delete a node from the beginning of a doubly linked list.
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					h) Delete a node from the end of a doubly linked list. i) Delete a node after a given node of a doubly linked list. j) Delete the entire doubly linked list. 4. Write a Menu driven C program to accomplish the following functionalities in circular doubly linked list. a) Create a circular doubly linked list. b) Display the elements of a circular doubly linked list. c) Insert a node at the beginning of a circular doubly linked list. d) Insert a node at the end of a circular doubly linked list. e) Delete a node from the beginning of a circular doubly linked list. f) Delete a node from the end of a circular doubly linked list. g) Delete a node after a given node of a circular doubly linked list. h) Delete the entire circular doubly linked list.
4	Linear Data Structure-Stack	Introduction, Stack Operations – Push, Pop, Peek, Representation of Stack (Array, Linked List), Application of Stack: Reversing a list, Parentheses checker, Conversion of an infix expression into a postfix expression, Evaluation of a postfix expression, Conversion of an infix expression into a prefix Expression, Evaluation of a	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://makautexam.net/aicte_details/Syllabus/MCA/sem221.pdf	7	1. Write a Menu driven C program to accomplish the following functionalities in Stack using an Array: a. Insert an element into the stack using an array (Push Operation). b. Delete an element from the stack using an array (Pop Operation). c. Return the value of the topmost element of the stack (without deleting it from the stack) using an array. d. Display the elements of a stack using an array.

		prefix expression, Recursion, Tower of Hanoi	Industry Mapping: The concepts delivered are in sync with the industry standards		2. Write a Menu driven C program to accomplish the following functionalities in Stack using Linked List: a. Insert an element into the stack using a Linked List (Push Operation). b. Delete an element from the stack using a Linked List (Pop Operation). c. Return the value of the topmost element of the stack (without deleting it from the stack) using a Linked List. d. Display the elements of the stack using a Linked List. 3. Write a program to convert an infix expression into its equivalent postfix notation. 4. Write a program to convert an infix expression into its equivalent prefix notation. 5. Write a program to evaluate a postfix expression. 6. Write a program to evaluate a prefix expression. 7. Write a program to print the Fibonacci series using recursion. 8. Write a program to solve the tower of Hanoi problem using recursion
5	Linear Data Structure-Queue	Introduction, Queue Operations – Enqueue, Dequeue, Peep, Representation of Queue (Array, Linked List), Types of Queues- Circular Queue, Deque, Priority Queue, Multiple Queue; Various operations (Enqueue, Dequeue, Peep) on the above mentioned queues-Both iterative & recursive implementation; Application of Queue	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://makautexam.net/aicte_details/Syllabus/MCA/se m221.pdf Industry Mapping: The concepts delivered are in	7	1. Write a Menu driven C program to accomplish the following functionalities in Queue using an Array: a. Insert an element into the queue using an array (Enqueue Operation). b. Delete an element from the queue using an array (Dequeue Operation). c. Return the value of the FRONT element of the queue (without deleting it from the queue) using an array (Peep operation) d. Display the elements of a queue using an array.

			sync with the industry standards		2. Write a Menu driven C program to accomplish the following functionalities in Queue using Linked List: a. Insert an element into the queue using a Linked List (Enqueue Operation). b. Delete an element from the queue using a Linked List (Dequeue Operation). c. Return the value of the FRONT element of the queue (without deleting it from the queue) using a Linked List (Peep operation). d. Display the elements of a queue using a Linked List. 3. Write a Menu driven C program to accomplish the following functionalities in Circular Queue using Array: a. Insert an element into the circular queue. b. Delete an element from the circular queue. c. Return the value of the FRONT element of the circular queue (without deleting it from the queue). Display the elements of a circular queue using the circular queue
6	Searching & Sorting	Searching- Types of Searching (Linear Search, Binary Search, Interpolation Search), Comparison among various Searching techniques Sorting-Types, Methods (Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort), Technique, Explanation, Algorithm and Examples on various sorting methods, Comparison of various sorting	International Academia: https://web.stanford.edu/class/cs97si/03-data-structures.pdf AICTE-prescribed syllabus: https://makautexam.net/aicte_details/Syllabus/MCA/se m221.pdf Industry Mapping: The	6	1. Write a C program to implement the concept of Bubble sort. 2. Write a C program to implement the concept of Selection sort. 3. Write a C program to implement the concept of Insertion sort. 4. Write a C program to implement the concept of Quick sort. 5. Write a C program to implement the concept of Merge sort. 6. Write a C program to show that Quick sort is better than Bubble sort.

		algorithms in terms of time complexity (Average case, Worst case)	concepts delivered are in sync with the industry standards		7. Write a C program to show that merge sort is more effective than quick sort. 8. Write a C program to search an element in an array using linear search. 9. Write a C program to search an element in an array using binary search. 10. Write a C program to search an element in an array using interpolation search.
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List of Books Text Books:			
Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
Reema Thareja	Data Structure Using C	2 nd Ed	Oxford
Reference Books:			
Tenenbaum	Data Structure Using C & C++	2 nd Ed	PEI
Kruse, Tondo & Leung	Data Structures & Program Design in C	2 nd Ed	PHI
Loudan	Mastering Algorithms With C		SPD/O'REILLY
Radhaganesan	C and Data Structures		Scitech Publications



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Subject Name: Business English and Communication

Credit: 3

Subject Code: MCA105

Lecture Hours: 33

Name of the Course: Business English and Communication	
Course Code: MCA105	Semester: 1
Duration: 33	Maximum Marks: 100
Teaching Scheme	Examination Scheme
Theory: 3	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Credit: 3	

Aim:	
Sl. No.	
1	Making the students industry-ready.
2	Making the students relevant in the contemporary society.
3	Making the students prepared to analyze and solve problems through listening, speaking, reading and writing skills.
Objective:	
Sl. No.	
1	To develop effective business writing and communication skills.
2	To enhance oral communication and presentation abilities among students.
3	To help students learn to prepare various business documents and technical reports.
4	To improve listening and reading comprehension.
Pre-Requisite:	
Sl. No.	
1.	Basic English Proficiency, Listening and Speaking Skills, Reading and Writing Skills, Academic and Social Contexts, and Familiarity with Corporate Ethics.
Course Outcome:	
1.	Achieve competence in grammar, syntax, and vocabulary fundamentals.
2.	Effectively communicate in academic and social contexts.
3.	Develop readiness for the industry and understand corporate ethics.
4.	Acquire basic proficiency in English encompassing reading, listening, comprehension, writing, and speaking skills.
Relevant Links:	
Study Material NPTEL Coursera Linkedin Learning	

CO-PO-PSO Mapping

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	2	-	2	-	1	2	3	-	3	3	-	-
CO2	3	3	-	2	-	3	1	2	3	3	-	3	3	-	-
CO3	2	3	-	2	-	3	1	3	2	3	-	3	3	-	-
CO4	3	3	-	2	-	2	-	2	2	3	-	3	3	-	-

Module number	Topic	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	Introduction to Business Communication.	- Importance of effective communication in business. - Types of business communication: Internal and External. - Communication process and barriers. - Strategies for effective communication. - Traditional and digital communication channels. - Effective use of email, memos, and business letters. - Communication through social media and professional networks.	International academia: https://www.coursera.org/learn/understanding-corporate-communications	4

2	Writing Skills Development	- Formats and styles of business letters. - Writing formal and informal business letters. - Common types of business letters: Inquiry, Complaint, Application, and Appreciation. - Structure of technical reports. - Writing abstracts, executive summaries, and conclusions. - Incorporating visuals and data in reports.	International Academia: https://ocw.mit.edu/courses/21g-222-expository-writing-for-bilingual-students-fall-2002/	8
3	Oral Communication Skills	- Preparing and delivering business presentations. - Using multimedia in presentations. - Techniques for effective public speaking. - Prepared speech exercises. - Extempore speech practice. - Role-playing business scenarios.	International Academia: https://ocw.mit.edu/courses/21g-222-expository-writing-for-bilingual-students-fall-2002/ Stanford Courses Online: https://online.stanford.edu/courses/csp-xcom88-high-impact-communication-advance-your-technology-career https://online.stanford.edu/courses/gsb-x0011-sharpen-your-communication-skills <i>Industry Mapping:</i> Campus Interviews and Recruitment Drives. Software: Orell Talk https://orelltalk.co m/	8
4	Listening and Reading Skills	- Importance of active listening in business. - Techniques for improving listening skills. - Listening comprehension exercises. - Developing reading comprehension. - Strategies for effective reading. - Comprehension tests and exercises.	International Academia: https://ocw.mit.edu/courses/21g-222-expository-writing-for-bilingual-students-fall-2002/ Stanford Courses Online:	

			https://online.stanford.edu/courses/csp-xcom88-high-impact-communication-advance-your-technology-career https://online.stanford.edu/courses/gsb-x0011-sharpen-your-communication-skills <i>Industry Mapping:</i> • Campus Interviews and recruitment drives. • Software: Orell Talk https://orelltalk.com/	
5	Practical Communication Applications	- Principles of organizing written material. - Structuring content for clarity and impact. - Editing and proofreading techniques - Designing effective posters for business presentations. - Visual and textual balance. - Presenting posters in professional settings.	<i>International Academia:</i> https://ocw.mit.edu/courses/21g-222-expository-writing-for-bilingual-students-fall-2002/ <i>Industry Mapping:</i> • Email writing and writing other relevant corporate documents. Software: Orell Talk https://orelltalk.com/	7

6	Practical Communication Skill Development	- Interactive sessions on negotiation and persuasion. - Group discussions and teamwork exercises	International academia: https://ocw.mit.edu/courses/15-280-communication-for-managers-fall-2016/ <i>Industry Mapping:</i> • Campus Interviews and recruitment drives.	6
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List of Books Text Books:			
Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
R C Sharma and Krishna Mohan	Business Correspondence & Report Writing	ISBN 978-9385965050 (5 th ed)	McGraw Hill Education
Reference Books:			
Matthukutty Monippally	Business Communication Strategies	ISBN 978-0070435773	McGraw Hill Education
K.R. Lakshminarayanan	English for Technical Communication	Volume 1 & 2 Combined Edition	SCITECH PUBLICATIONS (INDIA) PVT LTD
Asha Kaul	Business Communication	Second Edition	PHI Learning
Dr. Anjali Ghanekar	Communication Skills for Effective Management	ISBN 978-8186314500 (19 th ed)	Everest Publishing House

University of Engineering and Management
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University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2025, 1st Semester

Subject Name: Mental Maths for Professionals

Credit: 0.5

Subject Code: MCA(GS)101

Lecture Hours: 48

Module number	Topic	Sub-topics	Mapping with International/National/ State Level Exams	Lecture Hours	Corresponding Assignment
1	Quantitative Aptitude	Textbook: Quantitative Aptitude, Author: R.S Aggarwal, Publisher: S.Chand A. Quant Foundation 1.Number System(Chapter 1) 2. HCF and LCM (Chapter 2) 3. Decimal Fractions (Chapter 3) 4. Simplification (Chapter 4) 5. Square roots and cube roots (Chapter 5) 6. Percentage	International Exams 1. <i>GRE</i> (https://www.ets.org/gre/test-takers/general-test/prepare/content/verbal-reasoning.html#accordion-9f58105fc6-item-88093eca37) National Exams: 1. <i>UPSC Civil Services Exam</i> (https://upsc.gov.in/sites/default/files/Notif-CSP-23-english-010223.pdf), pg 25-26 2. <i>UPSC Combined Defence Services</i> (https://upsc.gov.in/sites/default	24	1. Assignment on Numerical Problem Solving using Vedic Mathematics principle. 2. Assignment on Numerical Problem-Solving using percentage to fraction relation.

		(Chapter 11)- Basic concept of percentage & its shortcut rules & their applications. 7. Ratio and Proportion (Chapter 13)- Basic concept of Ratio & Proportion, Shortcut tricks & their applications. 8. Partnership (Chapter 14) concept, rules & Applications, Percentage Advanced problems & shortcuts. Profit & Loss (Chapter 12)- Basic concept, formulae, shortcut tricks & their application.	lt/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21 3. Combined Graduate Level conducted by SSC (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_03042023.pdf) pg. 20-22 4. Intelligence Bureau ACIO (https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-Notification-Emp-News.pdf) State Level Exams: 1. Civil Services Executive Exam (WBCS) (https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement, pg 1 2. Miscellaneous Services Recruitment Examination (file:///C:/Users/UEMK/Downloads/2707970_2019.pdf) pg 1		
2	Logical Reasoning	Textbook: Modern Approach to Verbal and Non-Verbal	International Exams 1. GRE (https://www.ets.org/gre/test-	24	1. Assignment on Letter Coding, Number Coding, Conditional Coding and Chinese Pattern. 2. Assignment on Directions and Distance

	Reasoning, Author Dr. R.S Aggarwal, Publisher: S.Chand 1. Coding and Decoding (Chapter 4) i. Conditional Coding, ii. Word-Pattern Coding, iii. Chinese Coding, 2. Direction Sense Test(Chapter 8) i. Direction Sense Test, ii. Direction Distance Test, iii. Shadow based Questions. 3. Series Completion (Chapter 1) i. Alphabet Series, ii. Random Series, iii. Number Series, iv. Letter Gap, v. Missing Number Series, vi. Series Completion 4. Blood Relations (Chapter 5) –	takers/general-test/prepare/content/verbal-reasoning.html#accordion-9f58105fc6-item-88093eca37) National Exams: 1. <i>UPSC Civil Services Exam</i> (https://upsc.gov.in/sites/default/files/Notif-CSP-23-english-010223.pdf), pg 25-26 2. <i>UPSC Combined Defence Services</i> (https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21 3. <i>Combined Graduate Level conducted by SSC</i> (https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_03042023.pdf) pg. 20-22 4. <i>Intelligence Bureau ACIO</i> (https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-Notification-Emp-News.pdf) State Level Exams: 1. <i>Civil Services Executive Exam (WBCS)</i>	3. Assignment on Indicating based Blood Relation, Coding based Blood Relation and Family Tree based Blood Relation
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		i. Family Tree Questions ii. Indication Type BR, iii. Coding Blood Relations, iv. Miscellaneous Blood Relations.	https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement,pg1 <i>Miscellaneous Services Recruitment Examination</i> (file:///C:/Users/UEMK/Downloads/2707970_2019.pdf) pg 1		
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Learning Resources: Text

Book

1. Quantitative Aptitude- R.S Agarwal
2. Verbal & non-verbal reasoning- R.S Agarwal

University of Engineering and Management

Institute of Engineering & Management, New Town Campus

University of Engineering & Management, Jaipur

Syllabus for MCA Admission Batch 2025, 1st Semester

Subject Name: Competitive Aptitude Training - I

Credit: 0.5

Subject Code: MCA(GS)181

Lecture Hours: 24

Module number	Topic	Sub- topics	Mapping with International/National/State Level Exams	Lecture Hours	Corresponding Assignment
1	Verbal English-1:	Textbook: Objective General English Author: R.S Agarwal Publishing house: S.Chand 1) Introduction of Parts of speech: Introduction, Brief discussion of Parts of speech 2) What is noun, Kinds of Noun, Rules & Application. 3) Definition of Pronoun, Examples, Rules & Application 4) Definition of Subject Verb Agreement, Rules and Examples. 5) Basic Application of Vocabulary (Synonyms and	3. RBI Grade B https://rbidocs.rbi.org.in/rdoc/Content/PDFs/DADVTGRB09052023EA65E4FB1C2CF473396B4FD7E5F69CDDE.PDF), pg 22-23 4. IBPS Probationary officer https://www.ibps.in/wp-content/uploads/Detailed-Advt.-CRP-PO-XII.pdf), Pg 7. 5. Combined Graduate Level conducted by SSC https://ssc.nic.in/SSCFileServer/PortalManagement/UploadedFiles/notice_CGLE_03042023.pdf) pg. 20-22	12	Parts of Speech 1. Identify Parts of Speech: - Provide a paragraph and ask students to identify and label each word's part of speech (noun, verb, adjective, adverb, pronoun, preposition, conjunction, interjection). 2. Parts of Speech Matching: - Create a list of words and a list of parts of speech. Ask students to match each word to the correct part of speech. 3. Parts of Speech Sentences: Ask students to write

		Antonyms) Reading Comprehension, 7) Official Letter Writing	6. <i>Intelligence Bureau ACIO</i> (https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-Notification-Emp-News.pdf) 7. <i>XAT</i> (https://xat.org.in/xat-syllabus/) 8. <i>GATE</i> (https://gate2024.iisc.ac.in/papers-and-syllabus/) 9. <i>CAT</i> https://iimcat.ac.in/per/g01/pub/756/ASM/WebPortal/1/index.html?756@@1@@1 <i>State Level Exams:</i> <i>1. Civil Services Executive Exam (WBCS)</i> (https://wbpsc.gov.in/Download)		sentences using specific parts of speech (e.g., write a sentence with at least one noun, one verb, one adjective, and one adverb). Nouns Noun Identification: - Provide a list of sentences and ask students to underline or highlight the nouns. Types of Nouns: - Provide examples of common, proper, abstract, and collective nouns. Ask students to classify given nouns into these categories. Noun Plurals: - Give a list of singular nouns and ask students to write their plural forms. Pronouns Pronoun Replacement: - Provide sentences with nouns and ask students to replace the nouns with appropriate pronouns. Pronoun Agreement: - Create sentences with
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					pronouns and ask students to correct any errors in pronoun-antecedent agreement. 3. Types of Pronouns: Provide a list of pronouns and ask students to classify them into categories (personal, possessive, reflexive, demonstrative, interrogative, relative, indefinite). Synonyms 1. Synonym Matching: ○ Provide a list of words and a list of synonyms. Ask students to match each word with its synonym. 2. Synonym Sentences: ○ Give sentences with underlined words and ask students to rewrite the sentences using synonyms for the underlined words. 3. Synonym Stories: ○ Ask students to write a short story using a list of provided words and their synonyms. Antonyms 1. Antonym Matching:
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					○ Provide a list of words and a list of antonyms. Ask students to match each word with its antonym. 2. Antonym Sentences: ○ Give sentences with underlined words and ask students to rewrite the sentences using antonyms for the underlined words. 3. Antonym Pairs: ○ Ask students to create a list of ten words and write their antonyms next to them.
2	Data Interpretation level-I	Textbook: Table Data12.Interpretation	National Exams: 1. <i>UPSC Civil Services Exam</i> (https://upsc.gov.in/sites/default/files/Notif-CSP-23-engl-010223.pdf), pg 25-26 2. <i>UPSC Combined Defence Services</i> (https://upsc.gov.in/sites/default/files/Notif-CDS-I-Exam-2023-Engl-211222.pdf), pg 20-21) 3. <i>Combined Graduate Level conducted by SSC</i> (https://ssc.nic.in/SSCFileServer/PortalManagement/Uploa	12	• Calculating Totals and Averages: a. Provide a table with sales data over several months. Ask students to calculate the total sales and average sales for each month. • Comparing Data: b. Provide a table with data on two or more products or categories. Ask students to compare the data and determine which product/category performed better based on different criteria (e.g., sales, growth rate).

			dedFiles/notice_CGLE_0304_2023.pdf) pg. 20-22 4. Intelligence Bureau ACIO (https://www.pw.live/exams/wp-content/uploads/2023/11/IB-ACIO-Recruitment-2023-Notification-Emp-News.pdf) <i>State Level Exams:</i> 1. Civil Services Executive Exam (WBCS) (https://wbpsc.gov.in/Download?param1=20230225142430_Syllabus.pdf&param2=advertisement, pg 1 2. Miscellaneous Services Recruitment Examination (file:///C:/Users/UEMK/Downloads/2707970_2019.pdf), pg 1		
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Institute of Engineering & Management, New Town Campus
University of Engineering & Management, Jaipur
Syllabus for MCA Admission Batch 2025, 1st Semester



Subject Name: RESEARCH METHODOLOGY AND IPR

Credit: 02

Subject Code: MCA171

Lecture Hours: 36 Hrs.

Name of the Course: RESEARCH METHODOLOGY AND IPR	
Course Code: MCA171	Semester: FIRST
Duration: 36	Maximum Marks: 100
Teaching Scheme	Examination Scheme
Theory: 1	End Semester Exam: 100
Tutorial: 1	Continuous Assessment: 100
Credit: 2	
Aim:	
Sl. No.	
1	To develop comprehensive understanding of research methodologies and systematic approaches to academic inquiry
2	To foster awareness of intellectual property rights and their application in research and development
3	To equip students with practical skills for conducting ethical and legally compliant research

Objective:	
Sl. No.	
1	To enable students to formulate well-defined research problems and design appropriate research frameworks
2	To provide knowledge of various data collection methods and their appropriate application in different research contexts
3	To develop competency in data analysis techniques and interpretation of research findings
4	To instill understanding of IPR principles, patent processes, and research ethics in academic and industrial settings
Pre-Requisite: Basic understanding of statistics and data interpretation. Familiarity with computer applications and software tools. Foundational knowledge of research concepts and academic writing	
Course Outcome:	
CO1	Formulate and Design research problem
CO2	Understand and Comprehend the Data Collection Methods
CO3	Perform Data analysis and acquire Insights
CO4	Understand IPR and follow research ethics

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	2	1	1	0	2	1	2	1	3	1	1	3
CO2	2	3	1	3	2	1	0	1	1	1	0	2	1	2	2
CO3	2	2	2	3	2	1	0	1	1	2	1	3	2	3	2
CO4	1	1	1	1	0	2	1	3	1	2	1	2	0	0	2

Module number	Topic	Sub-topics	Lecture Hours
I	Research Design	Overview of research process and design, Use of Secondary and exploratory data to answer the research question, Qualitative research, Observation studies, Experiments and Surveys.	6
II	Data Collection and Sources	Measurements, Measurement Scales, Questionnaires and Instruments, Sampling and methods. Data - Preparing, Exploring, examining and displaying.	6
III	Data Analysis and Reporting	Overview of Multivariate analysis, Hypotheses testing and Measures of Association. Presenting Insights and findings using written reports and oral presentation.	6

IV	Intellectual Property Rights	Intellectual Property – The concept of IPR, Evolution and development of concept of IPR, IPR development process, Trade secrets, utility Models, IPR & Biodiversity, Role of WIPO and WTO in IPR establishments, Right of Property, Common rules of IPR practices, Types and Features of IPR Agreement, Trademark, Functions of UNESCO in IPR maintenance.	6
V	Patents	Patents – objectives and benefits of patent, Concept, features of patent, Inventive step, Specification, Types of patent application, process E-filing, Examination of patent, Grant of patent, Revocation, Equitable Assignments, Licences, Licensing of related patents, patent agents, Registration of patent agents.	6

List of Books Text Books:

Name of Author	Title of the Book	Edition/ISSN/ISBN	Name of the Publisher
1. Cooper Donald R, Schindler Pamela S and Sharma JK, “Business Research Methods”, Tata McGraw Hill Education, 11e (2012).			

Reference Books:

1. Catherine J. Holland, “Intellectual property: Patents, Trademarks, Copyrights, Trade Secrets”, Entrepreneur Press, 2007.
2. David Hunt, Long Nguyen, Matthew Rodgers, “Patent searching: tools & techniques”, Wiley, 2007.
3. The Institute of Company Secretaries of India, Statutory body under an Act of parliament, “Professional Programme Intellectual Property Rights, Law and practice”, September 2013.