FACULTY OF COMPUTER APPLICATIONS
Bachelor of Science (Data Science)

- **Sem.** : 1
- **Subject Code** : 05DS0101
- **Subject** : Programming In C
- **Course Objectives** :

1. To understand the fundamentals of C programming.
2. To code, document, test, and implement a well-structured C program.
3. To write reusable modules.
4. To work with different user defined and complex data types.
5. To understand concept of structure, union and file handling.

- **Prerequisites**: Basic Computer Fundamental knowledge.

Unit No	Topics Covered	No of lectures required
1	**Fundamental Concepts :** Introduction to C, The C Character Set, Identifiers and Keywords, Data Types, Constants, Variables, Declarations, Statements, printf(), scanf() functions, Arithmetic Operators, Unary Operators, Relational and Logical Operators, Assignment Operators, Conditional Operator, Sizeof operation,Library Functions.	10
2	**Control and Iterative Statements** Branching: if statement, if else Statement, if else if statement, nested if statement. Looping: Concept of Entry Control & Exit Control Loop, while Statement, do while Statement, for Statement, Nested loop, switch case Statement, break Statement, continue Statement, goto Statement.	10
3	**Functions and preprocessor directive** Brief Overview of UDF ,Defining a Function, Accessing a Function, Function Prototypes, Passing Arguments to a Function, Recursion, Automatic Variables, External (Global) Variables, Static Variables, Command Line	10

	Parameters, Macros, C Preprocessor.	
4	**Arrays and Pointer** Defining an Array, Processing an Array, Passing Arrays to Functions, Multidimensional Arrays, Arrays and Strings, String Library Functions, Pointer Fundamentals, Pointer Declarations, Passing Pointers to Functions, Pointers and One-Dimensional Arrays, Dynamic Memory Allocation, Arrays of Pointers, Passing Functions to Other Functions, More about Pointer Declarations.	**10**
5	**User defined Type and File Handling** Structure : Defining a Structure, Processing a Structure, User-Defined Data Types (typedef), Structures and Pointers, Passing Structures to Functions, Self-Referential Structures, Concept of Unions, Opening and Closing a Data File, Creating a Data File, Processing a Data File, Unformatted Data Files	**10**

Course Outcomes :

1. Describe fundamental concepts of C programming.
2. Define the use of control and looping statements.
3. Construct reusable modules by creating user defined functions.
4. Use different complex and user defined data types like array, pointer, structure and union.
5. Apply CRUD operations on data by using the concept of file handling, Data Files

Course Outcomes – Program Outcomes Mapping Table :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	L		M			H			
CO2		M			L			H	
CO3	L		L			M	M		M
CO4	M			H		L		M	
CO5		L			M		L		H

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Text Book :

1. Schaum's outline of Programming With C, Byron Gottfried, McGraw-Hill, Second Edition

Reference Books :

1. Programming in C, Pradip Dey - Manas Ghos, Oxford, Second Edition
2. Programming in C, Reema Thareja, Oxford, Second Edition
3. Let us C, YashvantKanetkar, BPB Publications, 8th Edition.

Web References :

1. https://www.tutorialspoint.com/cprogramming/index.htm
2. https://www.cprogramming.com/tutorial/c-tutorial.html

App References :

1. Learn C Programming by Coding and Programming - Programming Hub
2. C Programming - Learn Code, Theory & Discuss by SPDroid

Syllabus Coverage from text /reference book & web/app reference:

Unit #	Chapter Numbers
1	Chapter 1.5,1.6,Chapter-2,Chapter-4,Chapter-3
2	Chapter-6
3	Chapter-7, Chapter-8 and Chapter-14
4	Chapter-9 and Chapter-10
5	Chapter-11,Chapter-12

Marwadi University

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PRACTICALS

Unit No	List of Practicals
1	1. Write a Program to Print Your Complete Name. 2. Write a Program which takes 2 numbers from user and Perform All Arithmetic Operation and display result. 3. Write a program which calculates simple interest. 4. Write a program that input value from user and find out Area ofCircle. 5. Write a program that input two values from user and find out Area of Rectangle. 6. Write a program that input 5 subject marks (out of 100) from user and display total & percentage. 7. Write a program to Calculate the Square and Cube of anumber. 8. Write a program Interchange the value of two numbers usingthird variable. 9. Write a program Interchange the value of two numbers withoutusing third variable. 10. Write a program to convert temperature Fahrenheit to Celsius.
2	1. Write a program that input 2 values from user and find out Maximum. 2. Write a program that input age from user if age>=18 then print person is eligible for vote else person is not eligible for vote. 3. Write a program that input value from user and find outnumber is even or odd. 4. Write a program that input a number from user and display whether it is positive or negative.

	5. Write a C Program to input price quantity of an item from user and display final payment according to following condition. If total purchase(price*quantity) is greater than Rs.1000 then calculate discount 15% otherwise calculate discount 10% of total rupees. 6. Write a program to input year and find whether year is leap year or not.(Hint Use % Sign) 7. Write a program to input two values from user and check whether the first number is divisible by second or not. (Hint Use% Sign) 8. Input Three Values from user and Find Maximum. 9. Input RollNumber, Marks of 5 Subjects and find out Total,Percentage,Result and Grade. 10. Input day in number and print in text(for Example input 1 then Output Monday) 11. Input number and check whether the number is positive, negative or zero. 12. Write a program that Print 1 2 3 4 …… N 13. Write a program that Print 1 8 27 64……. N 14. Write a program that Print 1 3 5 7 …… N 15. Write a program which represent left align triangle of input special symbol. 16. Write a program which display right align triangle of number. 17. Write a program which display diamond shape of a given special symbol.

	18. Write a program to print multiplication table of inputted number. 19. Write a program to print 0 1 1 2 3 5 8 13…..n 20. Print first 10 natural number with its square and cube. 21. Accept 10 numbers from user one by one and displays its total value on screen. 22. Input x and y calculate its power value 23. Write a program that input number and find out sum of digits. 24. Write a program that input number and find out reverse of that number. 25. Write a program that input number and find out number is palindrome or not. 26. Write a program that input number and find out number is Armstrong or not. 27. Write a program that input number and find out number is Prime or not. 28. Write a program to find out prime numbers up to user series. 29. Write a program to find out Armstrong numbers up to user series. 30. Write a program that input number and find out factorial of given number.
3	1. Write a program which takes input of two numbers and calculate all arithmetic operations using UDF. 2. Write a program to find out factorial of number using UDF. 3. Write a program to find out reverse of number

	using UDF. 4. Write a program to find out Sum of digits using UDF. 5. Write a program to find out Number is Palindrome or not using UDF. 6. Write a program to find out Number is Armstrong or not using UDF. 7. Write a program to find out Number is Prime or not 8. Write a program to find out Fibonacci series up to user input using UDF. 9. Write a program to demonstrate use of macro 10. Write a program to demonstrate use of #include directive
4	1. Enter N elements in an array and displays only even number. 2. Enter N elements in an array and find total and average of them. 3. Enter N elements and display in reverse order. 4. Enter N elements and find how many are positive, negative, even and odd. 5. Copy the elements of one array into another. 6. Write a program to add & subtract two matrices. 7. Write a program which takes input of N elements and convert positive into negative number and vice versa. 8. Write a program to multiply two matrices. 9. Enter a string and find out length of string with

	using string function and without string function. 10. Enter String and Check the string is palindrome or not. 11. Swap two variables using pointer and function. 12. Find out area of circle using pointer and function 13. Find out maximum and minimum number using pointer to function. 14. Enter N elements and find out sum and average of them using dynamic array. 15. Enter N elements and find out sum of prime numbers using dynamic array.
5	1. Write a program to Add Two Complex Numbers by Passing Structure to a Function. 2. Write a program to Demonstrate difference between structure and union 3. Write a program that compares two given dates. To store a date use a structure that contains three members namely date, month and year. If the dates are equal then display message "equal" otherwise "not equal". 4. Write a program to demonstrate nested structure. 5. Write a program which creates a copy of any given text file. 6. Write a program to read a file and count no. of characters, blank spaces, tabs and lines in file 7. Write a program to append the content in given file. 8. Write a program to write string in "demo.txt"

	and print it in reverse order in file "reverse.txt" 9. Write a program to read any text file and convert the content in reverse case and store in another file. (Hint : If character is upper case then convert in lower and vice versa) 10. Write a program which counts total words from the specified text file.