

# Course Syllabus for CSE-141

1. **Title:** Structured Programming
2. **Credits:** 3 (3 lectures of 50 minutes per week)
3. **Course Teacher:** Dr. Md. Iqbal Hasan Sarker, Assistant Professor, Dept. of CSE, CUET.  
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## 4. Learning Resources:

- Textbook(s):** i) Programming in ANSI C  
- E. Balagurusamy (6th Edition).  
ii) Teach Yourself C  
- Herbert Schildt (3rd Edition).

## 5. Catalog Description:

**Structured Programming Language:** Introduction: data types, operators, expressions; Input and output: standard input and output, formatted input and output; Control structures: branching, looping; Arrays: 1-D array, multidimensional array; Strings; Functions and program structure: parameter passing conventions, scope rules and storage classes, recursion; User defined data types: structures, unions, enumerations; File management; Error handling; Variable length argument list; Command line parameters; Header files; Preprocessor; Linking; Library functions.  
Reference language: C

## 6. Prerequisite(s): None

## 7. Course Designation as Elective or Required: Required

## 8. Course Outcome: After successfully completing the course with a grade of D (2.0/4.0) or higher, the students should be able to do the following:

1. Explain the underlying concepts of structured programming.
- 2.

To explain the fundamental properties of the C language.

(c) The student should be able to combine the elements of the C language in developing structured programs.

(d) Able to demonstrate the skills necessary to correctly compile, debug, and test programs in C.

(e) To allow the students to write their own programs using standard language infrastructure regardless of the hardware or software platform.

- 9. Student Learning Outcomes:** After successfully completing the course with a grade of D (2.0/4.0) or better, the student should be able to do the following

No.	Course Learning Outcomes (CLOs)	POs #
1.	Identifying the steps involved in creating a program and itemize the elements of a typical program	1
2.	Understanding the essential of the concepts of Programming Techniques, control structures, Looping techniques.	2
3.	Describe how functions are constructed and implemented.	3
4.	Apply the programming paradigm to solve problems.	3

- 10. Program Outcomes Addressed: 1, 2 and 3.**

CLO#	Program Outcome (PO)	PO#
1.	Apply appropriate programming languages and tools, and design methodologies.	1
2.	Design, write and debug computer programs in C language.	3
3 & 4.	Identify, analyze a large problem and break into smaller parts, writing each part as a module or function.	2

# Lesson Plan

With

## Lesson Learning Outcomes (LLOs)

Lesson No.	Topic	Lesson Learning Outcome (at the end of the lesson students will be able to...)	Teaching-Learning Methodology	Assessment Method
Lesson-01	Overview of the course (B1: Ch-1)	<ul style="list-style-type: none"><li>Describe the objectives and outcomes of this course</li><li>Explain the necessity of this course</li><li>Learn about online course management system</li></ul>	Class Lecture	Not Applicable
Lesson-02	Introduction to structured programming (B1: Ch-1)	<ul style="list-style-type: none"><li>Describe the basic concept of structured programming</li><li>Explain the structure of a basic C program</li></ul>	Multimedia Presentation, Question and Answer	Test, Exam, Quiz etc.
Lesson-03	Keywords, constants and identifiers (B1: Ch-2)	<ul style="list-style-type: none"><li>Recognize different types of tokens</li><li>Differentiate between keywords, identifiers and constants</li><li>Know about the identifier declaration</li></ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-04	Data types and storage class (B1: Ch-2)	<ul style="list-style-type: none"><li>Describe different data types</li><li>Explain the size and range of data types</li><li>Define storage class</li></ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-05, 06, 07	Managing input and output (B1: Ch-4)	<ul style="list-style-type: none"><li>Read and write data in different format</li><li>Use different format specifiers</li></ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-08	Operators (B1: Ch-3, B2-Ch-4)	<ul style="list-style-type: none"><li>Know about different arithmetic, relational, logical and assignment operators</li><li>Use short hand of operators</li><li>Know about increment-decrement and conditional operator</li></ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-09	Expressions (B1: Ch-3, B2: Ch-4)	<ul style="list-style-type: none"><li>Evaluate an arithmetic expression</li><li>Know about precedence and associativity of operators in a program</li><li>Apply type conversion when required</li></ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
<b>Class Test - 01</b>				
Lesson-10	If-else and else-if ladder	<ul style="list-style-type: none"><li>Make decisions and implement logic using if-else statements</li></ul>	Multimedia Presentation ,	Test, Exam, Quiz etc.

	(B1: Ch-5)	<ul style="list-style-type: none"> <li>Explain flow-chart constructed from else-if ladder</li> </ul>	Question and Answer	
Lesson-11	Nested if-else (B1: Ch-5)	<ul style="list-style-type: none"> <li>Construct nested if-else for solving complex decision problems</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-12	Switch and goto statement (B1: Ch-5)	<ul style="list-style-type: none"> <li>Describe the rules for switch statements</li> <li>Apply goto statements for controlling flow of a program</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-13	While, do-while (B1: Ch-6, B2: Ch-3)	<ul style="list-style-type: none"> <li>Explain the structure of while and do-while loop</li> <li>Apply while and do-while loop to implement different program</li> <li>Differentiate between counter-controlled and sentinel-controlled loop</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-14	For loop (B1: Ch-6, B2: Ch-3)	<ul style="list-style-type: none"> <li>Know about different parts of a for statement</li> <li>Compare between while, do-while and for loop</li> <li>Apply additional features of loop</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-15, 16	Nested-loop (B1: Ch-6, B2: Ch-3)	<ul style="list-style-type: none"> <li>Apply nested-loop for solving complex decision problems</li> <li>Construct different nested loop structure such as for-while, while-for, for-for etc.</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-17	Jump in loops: Break, Continue (B1: Ch-6, B2: Ch-3)	<ul style="list-style-type: none"> <li>Use break and continue to skip part of a loop</li> <li>Write programs to implement the concept of break and continue</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.

### Class Test - 02

Lesson-18	1-D Array (B1: Ch-7, B2: Ch-5)	<ul style="list-style-type: none"> <li>Explain the concept of array</li> <li>Declare and initialize one dimensional array</li> <li>Differentiate between runtime and compile time initialization of arrays</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-19	Searching and sorting of array (B1: Ch-7, B2: Ch-5)	<ul style="list-style-type: none"> <li>Apply searching and sorting techniques in array</li> <li>Know about the complexity of searching and sorting</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-20	Multidimensional array (B1: Ch-7, B2: Ch-5)	<ul style="list-style-type: none"> <li>Declare and initialize 2-D arrays</li> <li>Perform matrix multiplication</li> <li>Solve problems using multidimensional arrays</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-21, 22	Character array and	<ul style="list-style-type: none"> <li>Declare and initialize string variables</li> <li>Read and write strings from and to terminals</li> </ul>	Multimedia Presentation ,	Test, Exam, Quiz etc.

	string (B1: Ch-8, B2: Ch-5)	<ul style="list-style-type: none"> <li>• Use getchar, putchar, gets and puts functions</li> <li>• know about the concept of field width in printf function</li> </ul>	Question and Answer	
Lesson-23	String handling functions (B1: Ch-8)	<ul style="list-style-type: none"> <li>• Describe strcat(), strcmp(), strcpy() and strlen() functions</li> <li>• Apply string-handling functions in program</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
<b>Class Test - 03</b>				
Lesson-24	Introduction to function (B1: Ch-9, B2: Ch-7)	<ul style="list-style-type: none"> <li>• Explain the concept of modular programming</li> <li>• Identify the necessity of user-defined functions</li> <li>• Differentiate between user-defined functions and library functions</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-25	Function declaration (B1: Ch-9, B2: Ch-7)	<ul style="list-style-type: none"> <li>• Find out the elements of a user-defined functions</li> <li>• Define function prototype</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-26, 27	Category of functions (B1: Ch-9, B2: Ch-7)	<ul style="list-style-type: none"> <li>• Classify different types of functions based on their arguments and return types</li> <li>• Apply nesting of functions</li> <li>• Describe the concept of scope, visibility and lifetime of variables in functions</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-28	Recursion (B1: Ch-9, B2: Ch-7)	<ul style="list-style-type: none"> <li>• Know about the concept and importance of recursion</li> <li>• Apply recursion to solve complex problems</li> <li>• Pass array as function argument</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-29, 30	Structure (B1: Ch-10)	<ul style="list-style-type: none"> <li>• Define structure variable</li> <li>• Compare between array and structure</li> <li>• Apply structure in a function</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-31	Union and enumeration (B1: Ch-10)	<ul style="list-style-type: none"> <li>• Describe the concept of union and enumeration</li> <li>• Differentiate between structure, union and enumeration</li> <li>• Know about bit-fields</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
<b>Class Test - 04</b>				
Lesson-32, 33	Pointer (B1: Ch-11, B2: Ch-6)	<ul style="list-style-type: none"> <li>• Know about the underlying concept of pointers</li> <li>• Define pointer variables</li> <li>• Apply pointers to access other variables</li> <li>• Relate between pointers and arrays</li> <li>• Pass pointers as function arguments</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-34, 35	File Handling (B1: Ch-12)	<ul style="list-style-type: none"> <li>• Define files in a c program</li> <li>• Know about the process of opening and closing a file</li> <li>• Perform input/output operations on files</li> <li>• Perform error handling operations during I/O</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.

		<ul style="list-style-type: none"> <li>• Write codes for randomly accessing files</li> </ul>		
Lesson-36	Command line arguments and dynamic memory allocation (B1: Ch-12, 13)	<ul style="list-style-type: none"> <li>• Explain the concept of command line arguments and dynamic memory allocation</li> <li>• Know about memory allocation functions: malloc, calloc, free, realloc</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-37	Header files, Preprocessor and linking	<ul style="list-style-type: none"> <li>• Explain the importance of header files</li> <li>• Use different preprocessors in program</li> <li>• Know about the concept of linking</li> </ul>	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-38, 39	Discussion class	<ul style="list-style-type: none"> <li>• Prepare for final exam</li> </ul>	Multimedia Presentation , Question and Answer	Not applicable