



Chittagong University of Engineering and Technology
Dept. of Computer Science and Engineering

Course Syllabus

Course Title: **Structured Programming**
Course No: **Cse-141**
Credit Hour: **3**

Prepared By

Dr. Md. Iqbal Hasan Sarker
Assistant Professor, Dept. of CSE, CUET

Omar Sharif
Lecturer, Dept. of CSE, CUET

Md. Billal Hossain
Lecturer, Dept. of CSE, CUET

Title: Structured Programming

Credits: 3 (3 lectures of 50 minutes per week)

Course Teacher:

Dr. Md. Iqbal Hasan Sarker, Assistant Professor, Dept. of CSE, CUET.
Omar Sharif, Lecturer, Dept. of CSE, CUET
Md. Billal Hossain, Lecturer, Dept. of CSE, CUET

Learning Resources:

- Book-1:** Programming in ANSI C
- E. Balagurusamy (6th Edition).
Book-2: Teach Yourself C
- Herbert Schildt (3rd Edition).

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

Prerequisite(s): None

Course Designation as Elective or Required: Required

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 fundamental concepts of structured programming.
2. Identify the steps involve in creating a program by control structure, looping and different programming techniques.
3. Apply appropriate programming paradigm to solve problems by designing and debugging.
4. Describe how functions are constructed and implemented.
5. Analyze a large problem and break it into smaller parts, design each part as a module or function and write the solution.

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"> Describe the objectives and outcomes of this course Explain the necessity of this course Learn about online course management system 	Class Lecture	Not Applicable
Lesson-02	Introduction to structured programming (B1: Ch-1)	<ul style="list-style-type: none"> Describe the basic concept of structured programming Explain the structure of a basic C program 	Multimedia Presentation, Question and Answer	Test, Exam, Quiz etc.
Lesson-03	Keywords, constants and identifiers (B1: Ch-2)	<ul style="list-style-type: none"> Recognize different types of tokens Differentiate between keywords, identifiers and constants Know about the identifier declaration 	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"> Describe different data types Explain the size and range of data types Define storage class 	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"> Read and write data in different format Use different format specifiers 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-08	Operators (B1: Ch-3, B2-Ch-4)	<ul style="list-style-type: none"> Know about different arithmetic, relational, logical and assignment operators Use short hand of operators Know about increment-decrement and conditional operator 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-09	Expressions (B1: Ch-3, B2: Ch-4)	<ul style="list-style-type: none"> Evaluate an arithmetic expression Know about precedence and associativity of operators in a program Apply type conversion when required 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.

Class Test - 01

Lesson-10	If-else and else-if ladder (B1: Ch-5)	<ul style="list-style-type: none"> • Make decisions and implement logic using if-else statements • Explain flow-chart constructed from else-if ladder 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-11	Nested if-else (B1: Ch-5)	<ul style="list-style-type: none"> • Construct nested if-else for solving complex decision problems 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-12	Switch and goto statement (B1: Ch-5)	<ul style="list-style-type: none"> • Describe the rules for switch statements • Apply goto statements for controlling flow of a program 	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"> • Explain the structure of while and do-while loop • Apply while and do-while loop to implement different program • Differentiate between counter-controlled and sentinel-controlled loop 	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"> • Know about different parts of a for statement • Compare between while, do-while and for loop • Apply additional features of loop 	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"> • Apply nested-loop for solving complex decision problems • Construct different nested loop structure such as for-while, while-for, for-for etc. 	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"> • Use break and continue to skip part of a loop • Write programs to implement the concept of break and continue 	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"> • Explain the concept of array • Declare and initialize one dimensional array • Differentiate between runtime and compile time initialization of arrays 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
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Lesson-19	Searching and sorting of array (B1: Ch-7, B2: Ch-5)	<ul style="list-style-type: none"> Apply searching and sorting techniques in array Know about the complexity of searching and sorting 	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"> Declare and initialize 2-D arrays Perform matrix multiplication Solve problems using multidimensional arrays 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-21, 22	Character array and string (B1: Ch-8, B2: Ch-5)	<ul style="list-style-type: none"> Declare and initialize string variables Read and write strings from and to terminals Use getchar, putchar, gets and puts functions know about the concept of field width in printf function 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-23	String handling functions (B1: Ch-8)	<ul style="list-style-type: none"> Describe strcat(), strcmp(), strcpy() and strlen() functions Apply string-handling functions in program 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Class Test - 03				
Lesson-24	Introduction to function (B1: Ch-9, B2: Ch-7)	<ul style="list-style-type: none"> Explain the concept of modular programming Identify the necessity of user-defined functions Differentiate between user-defined functions and library functions 	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"> Find out the elements of a user-defined functions Define function prototype 	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"> Classify different types of functions based on their arguments and return types Apply nesting of functions Describe the concept of scope, visibility and lifetime of variables in functions 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-28	Recursion (B1: Ch-9, B2: Ch-7)	<ul style="list-style-type: none"> Know about the concept and importance of recursion Apply recursion to solve complex problems Pass array as function argument 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.

Lesson-29, 30	Structure (B1: Ch-10)	<ul style="list-style-type: none"> Define structure variable Compare between array and structure Apply structure in a function 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-31	Union and enumeration (B1: Ch-10)	<ul style="list-style-type: none"> Describe the concept of union and enumeration Differentiate between structure, union and enumeration Know about bit-fields 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Class Test - 04				
Lesson-32, 33	Pointer (B1: Ch-11, B2: Ch-6)	<ul style="list-style-type: none"> Know about the underlying concept of pointers Define pointer variables Apply pointers to access other variables Relate between pointers and arrays Pass pointers as function arguments 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-34, 35	File Handling (B1: Ch-12)	<ul style="list-style-type: none"> Define files in a c program Know about the process of opening and closing a file Perform input/output operations on files Perform error handling operations during I/O Write codes for randomly accessing files 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-36	Command line arguments and dynamic memory allocation (B1: Ch-12, 13)	<ul style="list-style-type: none"> Explain the concept of command line arguments and dynamic memory allocation Know about memory allocation functions: malloc, calloc, free, realloc 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-37	Header files, Preprocessor and linking	<ul style="list-style-type: none"> Explain the importance of header files Use different preprocessors in program Know about the concept of linking 	Multimedia Presentation , Question and Answer	Test, Exam, Quiz etc.
Lesson-38, 39	Discussion class	<ul style="list-style-type: none"> Prepare for final exam 	Multimedia Presentation , Question and Answer	Not applicable