Short-term Hands-on Supplementary Course on C Programming

Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam
An Autonomous Institution, Affiliated to Anna University, Chennai

Department of Computer Science and Engineering

Training Details	
Staff Incharge	Dr. B. Prabavathy
Courses	Short-term Hands-on Supplementary Course on C Programming
Academic Year	2021-2022
Class	B.E. CSE - II (2020 - 2024) B.E. CSE - III (2019-2023)
Teaching Hours	15 weeks x 2 classes = 30 hours 1 Offline during Mentor Hour 1 Offline during Friday (4.00 pm 5.30 pm)
Requirements	1. ~40 systems in a dedicated laboratory 2. Repl.it or C development environment in systems 3. LCD Projector 4. 5:30 P.M. buses if classes are after working hours
Class Size	About 40 students

Table of Contents

Need for Supplementary Programme

Frequency of C programming based Laboratory courses in the curriculum

- Semester 2: Programming in C Laboratory
- Semester 3: Data Structures Laboratory
- Semester 4: Operating Systems Laboratory
- Semester 5: Networks Laboratory
- Semester 6: Compiler Design (Integrated Course)
- Semester 7: Graphics & Multimedia Laboratory

Objectives

- To lay solid foundations in C programming using a project-oriented practicum
- To ensure that students are able to implement theoretical concepts programmatically
- To promote collaborative learning by participating in coding parties and Ask Me Anything (AMA) sessions

Outcomes

- Implement, compile, debug, and execute procedural programs in C
- Implement programs in C with appropriate data representation and programming constructs
- Organize programs into functions and modules
- Develop programming projects in C modularly and refine incrementally
- Write clean and well documented code

Bloom's Taxonomy

Remember	Understand	Apply	Analyze	Evaluate	Create
K1	K2	K3	K4	K5	K6

Programme Plan

Resource Requirements

- LCD Projector
- Laboratory equipped with ~40 systems
- C development environment or Repl.it

Schedules and Planned Hours

- 15 weeks, 2 one-hour sessions per week (2 offline sessions)
- 15 x 2 = 30 hours
- Class schedule
    - Mentor hours + Friday evening post 3:40 P.M.
    - Need for 5:30 P.M. buses on the scheduled day

Assessment Plan

Assessment Tools	Topics Covered	Marks
Quiz (K3)	Topics 2-6	40
Capstone Project (K3)	All Topics	60

Quiz

- 20 Questions (4 questions X 5 topics)
    - Code snippet outputs
    - Debugging
    - Fill in the blanks
- Each answer carries 2 marks

Project

- Description of the problem will be given
- Clear project milestones and test-cases will be laid out
- Carried out in a team
- Evaluation Criteria
    - Structure of the project
    - Student's technical clarity
    - Code ethics
    - Project execution
    - Passing all the test cases including boundary conditions
    - Exceptions and error handling

Lesson Plan

Content Delivery Methods (CDM)

- Presentation - P
- Live Code Demo - LCD
- Tutorial - T

Topic No.	No. of Hours	Topic	K Level	CDM	Remarks
C Programming Basics					
1	1	**Presentation:** Structure of a C program, Comments, Keywords, Identifiers, Data types, Variables, Constants, Basic I/O statements	K2	P	
		Presentation: Operators, Expressions, Type cast & conversion **Tutorial:** Expression evaluation	K3	P & T	
Conditional Statements					
2	1	**Presentation:** Conditional statements (if, if-then, elseif, switch) **Live Code Demo:** Finding greatest of 3 numbers **Tutorial:** Simple calculator	K3	P, LCD & T	
Looping Statements					
3	1	**Presentation:** Looping statements (while, do-while, for) **Live Code Demo:** Find factorial of a number **Tutorial:** Sum of n numbers	K3	P, LCD & T	
Arrays					
4	2	**Presentation:** Arrays (1D & 2D arrays: initialization, input, output, processing) **Live Code Demo:** Sorting arrays of numbers **Tutorial:** Searching for a given element in an array	K3	P, LCD & T	
Strings					
5	1	**Presentation:** Strings (input, output, processing, built-in functions) **Live Code Demo:** Copying one string to another **Tutorial:** Count number of words in a sentence	K3	P, LCD & T	

Functions					
6	2	**Presentation:** Function (Prototype, Definition, Call, Parameter passing mechanisms, Global & Local variables, Overloading, Recursion) **Live Code Demo:** Changing the value of 'x' through function, Finding factorial of a number using recursive function **Tutorial:** Insertion of an element into an array	K3	P, LCD & T	
Pointers & Dynamic Memory Allocation					
7	2	**Presentation:** Pointers (Data-types, Pointer arithmetic, static & dynamic memory allocation, pointers & arrays, pointers and functions) **Live Code Demo:** Mutate arrays through functions **Tutorial:** Create, Delete elements in dynamic array	K3	P, LCD & T	
Structures					
8	2	**Presentation:** Structures (Initialization, Input, Output, Access, Self-referential structures, structure and pointers) **Live Code Demo:** Singly linked list **Tutorial:** Maintenance of student records	K3	P, LCD & T	
Files					
9	2	**Presentation:** Files (Text & Binary files: read, write, manipulate) **Live Code Demo:** Copy files by writing content **Tutorial:** Search for a given word in the file	K3	P, LCD & T	
10	1	Project Demo & Presentation	K3		

Total Sessions: 15