



Department of Computer Science & Engineering
National Institute of Technology, Jamshedpur
(An institution of national importance under MHRD, Govt. of India)

SPRING SEMESTER (B.Tech 2nd Sem.) 2019 – 2020

Course Handout

Course No. : CS1201
Course Title : Computer Programming (2-0-2)
Credit : 2
Instructor-In-Charge : Dr. Ritesh Kumar

COURSE OBJECTIVE:

There are numerous benefits from learning C; however, the most important benefit is that the C programming language is recognized worldwide and used in a multitude of applications, including advanced scientific systems and operating systems. In today's world, a computer programmer needs to be able to communicate with colleagues in different countries. Therefore it's important that even if they don't speak the same verbal language, at least the computer language is understandable to all. Programming in C is fairly easy because it uses basic commands in English.

S. No.	Topics	No. of Lectures
1	Digital computer fundamentals: Historical perspective, Early computers, the von Neumann architecture. Pseudo code, and Flowchart. Memory, Variables, Values, Instructions, Programs, Assembly language, High level language, Compiler, Assembler, Operating Systems, Binary and other number system representations and conversion between them. The C language Phases of developing a running computer program in C.	1- 5
2	Data Concepts in C: Constants, Variables, Expressions, Operators, and operator precedence in C. Managing input and output statements, Sequential control statements, Decision making statements (If-Else constructs), Loop control statements (While construct, Do While construct, For construct). Different basic data types and their sizes	6-10
3	One-dimensional Arrays: Declaration and Initialization, Two-dimensional Arrays: Declaration and initialization, Multidimensional Arrays. String variables, Reading and writing strings, Arithmetic operations on characters, Putting strings	11-17

	together, Comparison of two strings	
4	Functions: The prototype declaration, Function definition. Function call: Passing arguments to a function (by value, by reference), Scope of variables. Recursive function calls, Tail recursion, Tree of recursion.	18-21
5	Sorting problems: Selection sort, Insertion sort, Sorting in multidimensional arrays. Sorting in arrays Search problems: Linear search and binary search. Recursive and iterative formulations	22-25
6	Pointers: Declaring and dereferencing pointer variables, Pointer arithmetic. Accessing arrays through pointers, Pointer types, Pointer and strings. Structures in C: Motivation, examples, declaration, and use. Operations on structures, Passing structures as function arguments, Type defining structures. Self-referential structures, Dynamic data structures, Linked lists with examples	26-30
7	File operations in C: Input, output, and error streams. Opening, closing, and reading from files. Searching through files using functions such as fseek (), ftell (), and rewind (). Programming for command line arguments	30-35

Text books/References :

- 1 The C Programming Language” by Brian W Kernighan / Dennis Ritchie
- 2 Let Us C” by Yashavant Kanetkar
- 3 Programming in C” by Reema Thareja

EVALUATION SCHEME:

EC No.	Evaluation Component	Duration	Weightage
1	Mid Sem	2 Hrs.	30%
2	End Sem	3 Hrs.	50%
3	Surprise Quizzes/Assignments		20%

Instructor In-Charge
(CS1201)