

INSTITUTE	FACULTY OF TECHNOLOGY
PROGRAM	BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)
SEMESTER	5
COURSE TITLE	INTRODUCTION TO PROGRAMMING
COURSE CODE	01CI0516
COURSE CREDITS	3

Objective:

- 1 To develop various algorithm and programs for C/C++ language.
- 2 To acquaint the students with the basics of computer system, its components, and data representation in computer.
- 3 To develop various algorithm and programs for C/C++ language
- 4 To develop software applications to tackle problems related to Basic core civil engineering components.
- 5 Use of programming skills for optimization of structural systems in Civil Engineering.

Course Outcomes: After completion of this course, student will be able to:

- 1 State the programming problems by developing logical through flow charts and algorithms
- 2 Apply the Concepts of string, arrays, pointers, structures, class used for Program Writing.
- 3 Evaluate problems based on Civil Engineering using coding & programming.
- 4 Develop various programs for structural optimization.

Pre-requisite of course:Computer Programming

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	1	0	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Introduction Review of C, Difference between C and C++, Procedure Oriented and Object-Oriented Approach. Basic Concepts: Objects, classes, Principals like Abstraction, Encapsulation, Inheritance and Polymorphism, Dynamic Binding, Message Passing. Characteristics of Object-Oriented Languages. Introduction to Object-Oriented Modeling techniques (Object, Functional and Dynamic Modeling).	6

Contents : Unit	Topics	Contact Hours
2	Classes and Objects Abstract data types, Object & classes, attributes, methods, C++ class declaration, Local Class and Global Class, State identity and behavior of an object, Local Object and Global Object, Scope resolution operator, Friend Functions, Inline functions, Constructors and destructors, instantiation of objects, Types of Constructors, Static Class Data, Array of Objects, Constant member functions and Objects, Memory management Operators	7
3	Application of Coding & Programming Skills in Relevant Civil Engineering Topics Use of C/C++ to create various programs to solve structural analysis problems such as thin cylinders, support reactions, strain energy, Use of C/C++ to create various programs to solve Geotechnical Engineering problems such as earth pressure, slope stability, Use of C/C++ to create various programs to solve Highway Engineering problems such as Highway geometric design, Use of C/C++ to create various programs to generate hydrology and water resources engineering models such as watershed models	15
Total Hours		28

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Tutorial-1 Program in C/C++ to understand basic syntax, data types, operators	1
2	Tutorial-2 Program in C/C++ to understand function and arrays.	1
3	Tutorial-3 Program in C/C++ to understand strings and pointers	2
4	Tutorial-4 Program in C/C++ to understand basic structures and file handling.	2
5	Tutorial-5 Programs for Structural Analysis Problem - I	1
6	Tutorial-6 Programs for Structural Analysis Problem - II	1
7	Tutorial-7 Programs for Geotechnical Engineering related problem - I	1
8	Tutorial-8 Programs for Geotechnical Engineering related problem - II	1
9	Tutorial-9 Programs for Geotechnical Engineering related problem - I	1
10	Tutorial-10 Programs for Highway Engineering related problem - II	1
11	Tutorial-11 Programs for Hydrology and water resources related problem - I	1

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
12	Tutorial-12 Programs for Hydrology and water resources related problem - II	1
Total Hours		14

Textbook :

- 1 Programming in ANSI C, Balaguruswamy, McGraw-Hill, 2018

References:

- 1 Programming with C, Programming with C, Gottfried, McGraw-Hill, 2019

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
15.00	20.00	20.00	20.00	15.00	10.00

Instructional Method:

- 1 Prerequisite of the course and its pattern shall be discussed on the commencement of the course
- 2 Lectures shall be conducted in class room using various teaching aids
- 3 Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation
- 4 At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work

Supplementary Resources:

- 1 https://www.w3schools.com/c/c_intro.php
- 2 <https://www.geeksforgeeks.org/c-language-introduction/>
- 3 <https://www.guru99.com/c-programming-language.html>