K. S. INSTITUTE OF TECHNOLOGY

An Autonomous Institution under VTU, Approved by AICTE

Department of Electronics & Communication Engineering

FIRST / SECOND SEMESTER SYLLABUS

Course : Introduction to C++ Programming		Semester	I/II
Course Code	**25BPLC105B/205B**	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Examination type (SEE)	**Theory**		

Course Objectives (Course Skill Set)

1. Understanding object-oriented programming and Gain knowledge about the capability to store information together in an object.
2. Understand the capability of a class to rely upon another class and functions.
3. Understand about constructors which are special type of functions.
4. Create and process data in files using file I/O functions.
5. Use the generic programming features of C++ including Exception handling

Module-1

Introduction to Object Oriented Programming: Computer programming background- C++ overview. First C++ Program -Basic C++ syntax, Object Oriented Programming: What is an object, Classes, methods. abstraction and encapsulation, inheritance, abstract classes, polymorphism.

Textbook 1: Chapter 1 (1.1 to 1.8) **Number of Hours:8**

Module-2

Functions in C++: Tokens – Keywords – Identifiers and constants – Operators in C++ – Scope resolution operator – Expressions and their types – Special assignment expressions – Function prototyping – Call by reference – Return by reference – Inline functions -Default arguments – Function overloading, Operator Overloading.

Textbook 2: Chapter 3 (3.2,3.3,3.4,3.13,3.14,3.19,3.20,3.22), Chapter 4 (4.3,4.4.4,4.5,4.6,4.7,4.9) **Number of Hours:8**

Module-3

Inheritance & Polymorphism: Derived class Constructors, destructors-Types of Inheritance-Defining Derived classes, Single Inheritance, Multiple, Hierarchical Inheritance, Hybrid Inheritance.

Textbook 2: Chapter 6 (6.2,6.11) chapter 8 (8.1 to8.8) **Number of Hours:8**

Module-4

I/O Streams: C++ Class Hierarchy- File Stream-Text File Handling- Binary File Handling during file operations.

Textbook 1:Chapter 12 (12.5), Chapter 13 (13.6,13.7) **Number of Hours:8**

Module-5

Exception Handling: Introduction to Exception - Benefits of Exception handling- Try and catch block Throw statement- pre-defined exceptions in C++.

Textbook 2: Chapter 13 (13.2 to13.6) **Number of Hours:8**

Course outcome (Course Skill Set)

At the end of the course, the student will be able to:

CO1: Illustrate and design the solution to a problem using object-oriented programming concepts.

CO2: Develop reusability of the code with extensible Class types, User-defined operators and Function Overloading.

CO3: Make use of Inheritance and Polymorphism to obtain code reusability and extensibility.

CO4: Build the features of C++ including templates, exceptions and file handling to provide programmed solutions to complex problems.

CO5: Identify the use of Exception handling feature in C++ for handling errors at runtime.

Suggested Learning Resources:

1. Bhushan Trivedi, "Programming with ANSI C++", Oxford Press, Second Edition, 2012.
2. Balagurusamy E, Object Oriented Programming with C++, Tata McGraw Hill Education Pvt.Ltd, Fourth Edition 2010.

Reference books

1. Balagurusamy E, Object Oriented Programming with C++, Tata McGraw Hill
2. Education Pvt.Ltd., Sixth Edition 2016.
3. Bhave, "Object Oriented Programming with C++", Pearson Education, 2004.

Web links and Video Lectures (e-Resources):

1. Basics of C++ - https://www.youtube.com/watch?v=BClS40yzssA.
2. Functions of C++ - https://www.youtube.com/watch?v=p8ehAjZWjPw.

Tutorial Link:

1. https://www.w3schools.com/cpp/cpp_intro.asp.
2. https://www.edx.org/course/introduction-to-c-3.

Teaching-Learning Process (Innovative Delivery Methods)

The following are sample strategies that educators may adopt to enhance the effectiveness of the teaching- learning process and facilitate the achievement of course outcomes.

1. Lecture method (L) does not mean only the traditional lecture method, but a different type of teaching method may be adopted to develop the outcomes.
2. Show Video/animation films to explain the functioning of various analog and digital circuits.
3. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyse information rather than simply recall it.
4. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.

Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.

Assessment Structure:

The assessment in each course is divided equally between Continuous Internal Evaluation (CIE) and the Semester End Examination (SEE), with each carrying 50% weightage.

- To qualify and become eligible to appear for SEE, in the **CIE**, a student must score at least **40% of 50 marks**, i.e., **20 marks**.
- To pass the **SEE**, a student must score at least **35% of 50 marks**, i.e., **18 marks**.

Notwithstanding the above, a student is considered to have **passed the course,** provided the combined total of **CIE and SEE is at least 40 out of 100 marks**.

Continuous Comprehensive Evaluation (CCE):

CCE will be conducted for a total of 25 marks. It is recommended to include a maximum of two learning activities aimed at enhancing the holistic development of students. These activities should align with course objectives and promote higher-order thinking and application-based learning.

Learning Activity 1: (Marks 25): Two assignments (for 10marks and 15marks) related to simulation of simple circuits (using any simulation tool such as LT Spice, KI Cad etc.), at RBL3, RBL4, or RBL5 levels, assignment reports should include circuit design, schematic, and simulation results.

Suggested Learning Activities may include (but are not limited to):

- **Learning Activity -1:** Course Project
- **Learning Activity -2:** Open Book Test (preferably at RBL4 and RBL5 levels)
- **Learning Activity -3:** Assignment (at RBL3, RBL4, or RBL5 levels)
- **Learning Activity -4:** Any other relevant and innovative academic activity
- **Learning Activity -5:** Use of MOOCs and Online Platforms

Suggest Innovative Deliver Methods may include (but are not limited to):

- Flipped Classroom
- Problem-Based Learning (PBL)
- Case-Based Teaching
- Simulation and Virtual Labs
- Partial Delivery of course by Industry expert/ industrial visits