1. **Title of the Course and Number:** Graphics using C++

**2. Objective of the Course:**

This course will introduce students to all aspects of C++ programming concepts. Students will gain basic principles and techniques for computer graphics concepts.

**3. Prerequisites:**

* Basic knowledge in C programming

**4. Learning Outcomes:**

* Students will be able to:
* Learn object-oriented programming concepts
* Understanding of fundamentals of computer graphics.
* Create simple graphical applications

**2. Course Assessment and Grading System:**

|  |  |  |
| --- | --- | --- |
| **S. No** | **Description** | **Max. Marks** |
| 1. | Practical Test – Basic C++ Programming | 25 |
| 2. | Practical Test – Graphics Functions | 25 |
| 3. | Practical Test – Simple Object Creations | 30 |
| Total (A) | | 80 |
| Objective Questions Test(B) | | 20 |
| Total Marks (A+B) | | 100 |

**3. Teaching Strategies:**

|  |  |  |
| --- | --- | --- |
| **S.No** | **Description** | **Teaching Methods** |
| 1. | Fundamentals of OOPS | PPTs and Exercises |
| 2. | C++ Core concepts | PPTs, Demos and Exercises |
| 3. | Graphical Functions | PPTs, Demos and Exercises |

**4. Syllabus:**

**UNIT I FUNDAMENTALS OF OBJECT ORIENTED PROGRAMMING 10**

Object Oriented Programming concepts - C++ Characteristics - Object-Oriented Paradigm - Abstract Data Types -I/O Services - Variables: Definition, Declaration, and Scope -Variables: Dynamic Creation and Derived Data - Functions: Declaration and Definition - Polymorphism

**UNIT II CLASSES AND OBJECTS 10**

Defining Classes in C++ - Classes and Encapsulation -Member Functions - Instantiating and Using Classes - Constant and Static Class Members - Using Constructors -Multiple Constructors -Using Destructors to Destroy Instances - Overview of Inheritance - Defining Base and Derived Classes

**UNIT II GRAPHICS AND ITS FUNCTIONS 10**

Graphics Essentials- Graphics Coordinate System- Basics of Color- Co-ordinate Systems- Windowing-2D-3D- Graphics Functions -Drawing Text – Shapes

**5. Course Content:**

|  |  |  |  |
| --- | --- | --- | --- |
| **No of Day** | **No. of Lecture Hrs** | **Content to Deliver** | **Remarks** |
| 1 | 3 | Introduction to Object Oriented Programming concepts - C++ Characteristics - Object-Oriented Paradigm | PPT |
| 2 | 3 | Abstract Data Types -I/O Services - Variables: Definition, Declaration, and Scope -Variables | PPT & Lab |
| 3 | 2 | Functions: Declaration and Definition - Polymorphism | PPT & Lab |
| 4 | 2 | Defining Classes in C++ - Classes and Encapsulation -Member Functions | PPT & Lab |
| 5 | 3 | Instantiating and Using Classes - Constant and Static Class Members | PPT & Lab |
| 6 | 3 | Using Constructors -Multiple Constructors -Using Destructors to Destroy Instances | PPT & Lab |
| 7 | 3 | Overview of Inheritance - Defining Base and Derived Classes | PPT & Lab |
| 8 | 2 | Graphics Essentials- Graphics Coordinate System- Basics of Color | PPT & Lab |
| 9 | 2 | Co-ordinate Systems- Windowing | PPT & Lab |
| 10 | 3 | 2D-3D | PPT & Lab |
| 11 | 2 | Graphics Functions -Drawing Text | PPT & Lab |
| 12 | 2 | Shapes | PPT & Lab |

**6. References:**

1. C++ How to Program 7th Edition by Paul Deitel and Harvey M. Deitel.
2. C++ Primer 5th Edition by S. B. Lippman, J. Lajoie
3. Introduction to C++ Programming and Graphics by C. Pozrikidis

**7. Workload for students:**

* Theory : 10 Hours
* Practical : 20 Hours

Total : 30 Hours

**8. Resource Requirements:**

* Turbo C / C++ compiler that supports graphics.h package

**List of Experiments**

1. Implementation of classes and functions
2. Implementation of constructors
3. Implementation of polymorphism
4. Implementation of inheritance concepts
5. Implementation of basic output primitives using graphics functions
6. Implementation of 3D shapes using graphics functions