# Assignment 4: Friend Classes and Friend Functions

Course Title: Object Oriented Programming

Course Code: CC-112

Credit Hours: 3 (Theory)

Total Marks: 20

Submission Deadline: 28-06-2028

CLOs Assessed: CLO-2, CLO-3

Instructor: Syed Hamed Raza

## Objective:

This assignment is designed to help students:  
- Understand the purpose and usage of friend functions and friend classes.  
- Apply the concept of controlled access between classes.  
- Explore encapsulation and its intentional relaxation in C++.

## Instructions:

- Submit your work as a single `.cpp` file and a brief report (PDF format).  
- Include proper comments in the code.  
- Ensure code is well-indented and readable.  
- Academic honesty must be maintained.

## Part A – Friend Functions [10 Marks]

1. Theory (2 Marks):

What is a friend function? When and why is it used in object-oriented design?

2. Programming (8 Marks):

Create two classes: `Box` and `Display`.  
 - `Box` should have private attributes length, width, and height.  
 - Define a friend function in `Display` that can access and print the dimensions of `Box`.

## Part B – Friend Classes [10 Marks]

1. Theory (2 Marks):

Explain the difference between friend functions and friend classes with an example.

2. Programming (8 Marks):

Create a class `Student` with private data members `name` and `grade`.  
 Declare another class `Admin` as a friend of `Student` that can access and update the grade.