# National University of Computer and Emerging Sciences


## Laboratory Manual

*for*

## Object Oriented Programing Lab

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| Section | BCS-2E |
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**Objectives:**

In this lab, students will practice:

1. Classes basic
2. Getter, Setter, Constructor, Copy Constructor

# 1 Exercise- Circle class:

Design a class **Circle** with private attributes **radius** and **area**. Calculate the **area** of the circle using a member function.

# 2 Exercise- Output:

Run the code given and write output:

```
#include<iostream>
#include<string>
using namespace std;
class GradeBook
{
public:
void setCourseName(string name )
 {
    courseName = name;
 } // end function setCourseName

string getCourseName() const
 {
   return courseName;
 } // end function getCourseName

void displayMessage() const
 {
  cout << "Welcome to the grade book for\n" << << "!" << endl;
 } // end function displayMessage

private:
 string courseName;
}; // end class GradeBook

int main()
{
string nameOfCourse;
GradeBook myGradeBook;
cout << "Initial course name is: “<< endl;
```

```
cout << "\nPlease enter the course name:" << endl;
getline(cin, nameOfCourse );
myGradeBook.setCourseName(nameOfCourse);
cout << endl;
myGradeBook.displayMessage();
 } // end main
```

## 3 Exercise- Student class:

Create a class **Student** with private attributes **StudentId**, **name**, **grade**, and **GPA**. Provide getter and setter methods for each attribute. Also, write a constructor to initialize the **Student** details.

Example output:

```
Student ID: 101
Name: John Doe
Grade: A
GPA: 3.75

Updated Details:
Grade: B
GPA: 3.5
```

## 4 Exercise- Product class:

Create a class **Product** with private attributes **productId**, **productName**, and **price**. Implement getter and setter methods for each attribute. Write a constructor to set the initial values of the product details. Also, include a copy constructor to create a copy of a Product object.

Example output:

```
Product ID: 1001
Product Name: Laptop
Price: $1200.5

Copied Product Details:
Product ID: 1001
Product Name: Laptop
Price: $1200.5
```

## 5 Exercise- Bank Management System:

Implement a class **BankAccount** to manage bank account details. Include private attributes such as **accountNumber**, **accountHolderName**, and **balance**. Provide getter and setter methods for each attribute. Also, write a constructor to initialize the account details and a copy constructor to duplicate a bank account object.