COSC 102: Object-Oriented Programming (3 credits)

This course introduces the fundamental concepts of Object-Oriented Programming (OOP). Students will learn how to design, implement, and test software using the OOP paradigm. The course covers topics such as encapsulation, inheritance, polymorphism, abstraction, and object-oriented design patterns. The course will be taught using a high-level programming language. *(Prerequisite: COSC 101)*

Course Learning Outcomes:

By the end of the course, students will be able to:

A1. Demonstrate detailed knowledge of principles and theories of Object-Oriented Programming.

A2. Apply various programming concepts using programming tools with proper syntax and programming conventions.

B1. Formulate a model for a software solution through the application of the appropriate classes and their relationships.

B2. Solve a computing problem using Object-Oriented programming concepts to meet the given requirement.

Course Learning Materials:

- Liang, Y. D. (2018). Introduction to Java programming and data structures. Pearson Education.
- Barry A. Burd (2020). Java For Dummies, 8th Edition.

Course Content:

1. Elementary Programming review: Data types, User input.
2. Elementary Programming review: Expressions, Conversion and casting, String methods
3. Selections: If statements, Switch statements
4. Loops
5. Introduction to OOP Classes and Objects
6. Encapsulation and Information Hiding
7. Inheritance and Polymorphism
8. Exceptions and Error Handling
9. Text I/O
10. Abstract Classes and Interfaces
11. Collections and Generics
12. Design Patterns
13. Unit Testing and Debugging
14. GUI Programming and Event Handling