Addis Ababa university
College of Natural and Computational Science
Department of Computer Science

Course code: CoSc2111
Credit hour: 3
Lab hour: 3

Course description

This programming course emphasizes the methodology of programming from an object-oriented perspective and software engineering principles. It allows students to develop the ability to analyze programming problems and design and document suitable solutions and to implement reliable and robust software using contemporary program design methods. Topics to be dealt with are: classes: data abstraction, information hiding, overloading; inheritance; polymorphism; exceptions handling.

Course objectives

Upon successful completion of the course, students will be able to:

- Explain the basic object oriented concepts
- Successfully code, debug and run programs with appropriate development environment
- Work on more advanced programs
- Have clear differentiation between structural and object oriented programming paradigms

Course outline

Chapter 1: Introduction to Object-Oriented Programming

1.1. Types of programming paradigms
1.2. Overview of OO principles
1.3. Editing, Compiling and Interpreting

Chapter 2: Objects and Classes

2.1.Defining a class
2.2.Creating an Object
2.3.Instantiating and using objects
    2.3.1. Printing to the Console
    2.3.2. Methods and Messages
    2.3.3. Parameter Passing
    2.3.4. Comparing and Identifying Objects
    2.3.5. Destroying Objects
    2.3.6. Enumerated Types
2.4.Instance fields
2.5.Constructors and Methods

2.6.Access Modifiers
2.7.Encapsulation

Chapter 3: Inheritance and Polymorphism

1.1.Inheritance
1.2.Casting
1.3.Method Overriding and Overloading
1.4.Polymorphism
1.5.Super
1.6.The Object Class
1.7.Abstract Classes
1.8.Interfaces
1.9.Using Interfaces

Chapter 4: Exception Handling

4.1.Exceptions Overview
4.2.Catching Exceptions
4.3.The finally Block
4.4.Exception Methods
4.5.Declaring Exceptions
4.6.Defining and Throwing Exceptions
4.7.Errors and Runtime Exceptions

Chapter 5 - AWT and Swing

5.1 Components of AWT and Swing (Frame, Label, Button, TextField, ComboBox; JFrame, JLabel, JButton, JTextField, JcomboBox)

5.2 Event handling (Sources, Listeners, Events)

Chapter 6: Data structures

6.1. The Set and Set Implementation Classes
6.2. The List and List Implementation Classes
6.3. The Queue and Queue Implementation Classes
6.4. Map/ dictionary

Teaching- learning methods

Two contact hours of lectures, three hours of lab and two hours of tutorials per week.

Assessment methods

- Quiz/ Assignment 10%
- Lab Exam/Project 20%
- Mid Exam 20%
- Final Exam 50%

Text book

1. H.M. Deitel, P.J. Deitel, Java How to Program. 8th ed. Prentice Hall
2. Eckel, Bruce. Thinking in Java. 4th Ed. New Jersey: Prentice Hall