

## Saint Leo University

### COM 209

#### Programming in Java

#### Course Description:

JAVA is a modern object-oriented programming language widely used to develop Web-based applications. This course will introduce the student to object-oriented programming using JAVA, and the development of interactive applications and applets. Course fee may apply.

#### Prerequisite:

COM 204 or equivalent

#### Textbook:

**Students who decide not to buy the Cengage Unlimited subscription will have the choice of purchasing one of these two packages. It is not necessary to buy both.**

Farrell. *Java Programming*. 9<sup>th</sup> (2018) Cengage Custom ISBN# 9781337756280 (print book with MindTap access)

OR

Farrell. *Java Programming*. 9th (2018) Cengage Custom ISBN# 9781337397117 (eBook with MindTap access)

#### Course Objectives:

By the end of this course, the student will have the ability to:

1. Demonstrate a fundamental knowledge of the object-oriented programming language Java to include writing, testing, and debugging Java code using the Java6 runtime environment.
2. Develop algorithms using the sequence, select, and repetition structures; document the structure of these algorithms using flow charts and pseudo code; and implement these algorithms as Classes in Java code. Students also demonstrate their knowledge of object oriented programming concepts through the use of encapsulation, inheritance, and polymorphism, in their programming assignments.
3. Create and use variables and named constants of the appropriate data types, including integers, floating point numbers, text strings, and one & two dimensional arrays; also convert data between different types as needed to process input and produce output.
4. Write Java code to perform logical, arithmetic, and string operations on data.
5. Write code to interact with the user and file system using the rich library of GUI components provided by Java. In addition, this code will validate input and echo input values back to the user to ensure proper interpretation and prevent use of invalid results.
6. **VALUES OUTCOME:** In this class, we will study how to organize data and effectively communicate information. Hence, we will learn how to take precautions while recording data and presenting it in a manner that prevents misunderstanding, practicing Saint Leo University's core value of *Integrity*.

#### Core Value:

*Integrity:* The commitment of Saint Leo University to excellence demands that its members live its mission and deliver on its promise. The faculty, staff, and students pledge to be honest, just, and consistent in word and deed.

### **Evaluation:**

Each student will be evaluated using several different means. Evaluations will include four quizzes, eight chapter exercises, and eight discussion questions.

<b>Graded Assignment</b>	<b>Percent of Grade</b>
Quizzes (4)	30%
Chapter Exercises (8)	60%
Discussions (8)	10%
Total	100%

There will be four quizzes consisting of 20 questions, and the test-taking period will be 30 minutes. Quizzes will consist of true/false and multiple-choice items demonstrating the student's mastery of the material.

### **Grading Scale:**

<b>Grade</b>	<b>Score (%)</b>
A	94-100
A-	90-93
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
D+	67-69
D	60-66
F	0-59

## **Course Schedule**

### **Module 1                      Creating Classes and Objects**

#### **Objectives**

When you complete this module, you should be able to:

- Explain Java™ programming language.
- Explain object-oriented programming concepts.
- Analyze a Java™ application that uses console output.
- Compile and run a Java™ application using console and graphical user interface (GUI) output.
- Recall rules for naming classes, variables, and constants.
- Use appropriate data type for declaring constants and variables.
- Utilize arithmetic operators in a Java™ program.

## Assignments

Items to be Completed:	Due No Later Than:
Post an introduction to the class	Thursday 11:59 PM EST/EDT
Install student data file, compiler (Java SE 9)	
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Answer review questions for Chapters 1 and 2	
Submit Exercises for Chapters 1 and 2	Sunday 11:59 PM EST/EDT

## Module 2                      Using Methods, Classes, and Objects

### Objectives

When you complete this module, you should be able to:

- Create methods with no arguments, a single argument, and multiple arguments.
- Create methods that return values.
- Create instance methods in a class.
- Declare objects and use their methods.
- Explain the concept of blocks and scope in classes and methods.
- Overload methods and constructors.
- Compile programs using automatically imported, prewritten constants, and methods.

## Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Answer review questions for Chapters 3 and 4	
Submit Exercises for Chapters 3 and 4	Sunday 11:59 PM EST/EDT
Complete Quiz 1	Sunday 11:59 PM EST/EDT

### Module 3 Objectives

#### Control Structures

When you complete this module, you should be able to:

- Explain decision structure used in controlling the flow of a program.
- Compile programs using the *if* and *if...else* control structures including nesting.
- Use AND, OR, NOT, and conditional operators in program statements.
- Use the *switch* statement in program statements.
- Explain the use loop structure has in programming.
- Compile programs using the *while*, *do... while*, *for*, and nested loops.
- Use shortcut arithmetic operators in program statements.

### Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Answer review questions for Chapters 5 and 6	
Submit Exercises for Chapters 5 and 6	Sunday 11:59 PM EST/EDT

### Module 4

#### Strings and Arrays

### Objectives

When you complete this module, you should be able to:

- Identify problems that can occur when you manipulate string data.
- Manipulate characters.
- Use the class *String* to declare *String* objects and use its methods to manipulate them.
- Use the *StringBuffer* class.
- Declare and initialize an array.
- Search an array for a range or exact match.
- Sort array elements.
- Use two-dimensional and multi-dimensional arrays.

### Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Answer review questions for Chapters 7, 8, and 9	
Submit Exercises for Chapters 7, 8, and 9	Sunday 11:59 PM EST/EDT
Complete Quiz 2	Sunday 11:59 PM EST/EDT

## Module 5 Inheritance

**Objectives** When you complete this module, you should be able to:

- Explain the concept of inheritance.
- Explain Overriding and Polymorphism.
- Construct superclass constructors that require arguments.
  - Access superclass methods.
  - Use methods you cannot override.
  - Create and use abstract classes.
  - Create arrays of subclass objects.
- Create and use interfaces and packages.

## Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Answer review questions For Chapters 10 and 11	
Submit Exercises for Chapters 10 and 11	Sunday 11:59 PM EST/EDT

## Module 6 File Input/Output Operations and Exception Handling

**Objectives** When you complete this module, you should be able to:

- Explain the advantages of exception handling.
- Compile programs using try and catch blocks to handle exceptions.
- Specify the exceptions a method can throw.
- Trace exceptions through the call stack.
- Compile programs throwing and catching multiple exceptions.
- Explain data file organization and streams.
- Write records to and read records from a sequential access file.
- Write records to and read records from a random access file.

## Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Answer review questions for Chapters 12 and 13	
Submit Exercises for Chapters 12 and 13	Sunday 11:59 PM EST/EDT
Complete Quiz 3	Sunday 11:59 PM EST/EDT

## Module 7      Swing Components and Layout Managers

**Objectives** When you complete this module, you should be able to:

- Compile programs using JFrame, JPanel, JCheckBox, JComboBox, and ButtonGroup classes.
- Extend the JFrame class.
- Explain Swing event listeners.
- Create JScrollPanels.
- Explain layout managers.
- Explain events and event handling.
- Compile programs to handle mouse events.

## Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Answer review questions for Chapters 14	
Submit Exercises for Chapter 14	Sunday 11:59 PM EST/EDT

## Module 8      Applets and Graphics

## Objectives

When you complete this module, you should be able to:

- Describe JavaFX
- Describe the life cycle of a JavaFX application
- Recognize the JavaFX structure: stage, scene, widgets
- Write an application using JavaFX
- Create JavaFX applications using Scene Builder
- Use widgets as design elements in FXML layouts ▪ Use CSS to create visual effects ▪ Create animations in JavaFX.

## Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Answer review questions for Chapter 15	
Submit Exercises for Chapter 15	Sunday 11:59 PM EST/EDT
Complete Quiz 4	Sunday 11:59 PM EST/EDT