

**Saint Leo University**

**COM 204  
Programming Logic and Design**

**Course Description:**

This course introduces students to programming concepts, and to the foundations of program logic used in structured, object-oriented, and event-driven programming. The main goal of this course is to introduce universal programming concepts applied to problem solving in information processing. Students use algorithms and computer logic to translate data into information through structured design, coding, testing, and program debugging. Course fee may apply.

**Prerequisite:**

COM 140

**Textbook:**

Farrell, J. (2018). Programming logic and design (Comprehensive, 9th ed). Cengage Publishing. ISBN: 978-1-337-102070

**Learning Outcomes:**

- Demonstrate a fundamental knowledge of programming logic, problem solving using program logic, and the program development cycle.
- Demonstrate a fundamental knowledge of Structured, Object-oriented, and Event-driven programming methodologies.
- Develop algorithms using the sequence, select, and repetition structures; document the structure of these algorithms using flow charts and pseudo code; and translate these algorithms into procedural blocks (procedures, functions).
- Create and use variables and named constants of the appropriate data types, including integers, floating point numbers, text strings, and one-dimensional arrays.
- Use object-oriented and event-driven programming methodologies to create modular and GUIbased interactive programs.
- 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:**

Your grade in the course will be based on the following:

<b>Assignment</b>		<b>% of Total</b>
Examinations	(2)	40%
Assignments	(8)	52%
Discussions	(8)	8%
<b>Total</b>		<b>100%</b>

**Examinations:**

The midterm and final exams are timed exams that will consist of twenty-five (25) multiple-choice questions that need to be completed in forty-five minutes.

**Assignments:**

Assignments will require students to complete 3 or 4 problems chosen from the exercise problems at the textbook chapters covered in each module. These exercises require students to use program logic to develop solutions to the assigned problems in the form of flowcharts and (or) pseudo code. Completed assignments can be turned in as either plain-text files (.txt files), or Word document files, or PDF files.

**Discussions:**

Each module will consist of a Discussion Forum where students post discussion questions on topics covered in a module, and respond to other student postings. Discussion grades are based on active student participation on the discussion forums.

**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                    An Overview of Computers and Programming**

**Objectives**

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

- Describe the difference between hardware and software components of a computer system.
- Describe the steps involved in the program development cycle.
- Use pseudo code statements and flowchart symbols to describe program logic.
- Describe the evolution of programming models.

**Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Post introduction to the class	Thursday 11:59 PM EST/EDT
Read the assigned materials	
Post 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
Review Key Terms	
Submit Assignment 1	Sunday 11:59 PM EST/EDT

**Module 2                    Elements of High-Quality Programs and Structured Programming**

**Objectives**

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

- Declare and use variables and constants in a computer program.
- Explain the advantages of modularization and the process of modularizing a program.
- Use hierarchy charts to organize and document modular programs.
- Apply the fundamentals of structured programming when developing program logic.

**Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post 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
Complete Practice Quiz	
Submit Assignment 2	Sunday 11:59 PM EST/EDT



be able to:

### Module 3      **Making Decisions Using Selection Structures**

#### Objectives

When you complete this module, you should

- Use decision structures in program logic apply Boolean expressions to make comparisons.
- Explain the meaning of relational comparison operators and apply them in decision structures.
- Apply the logical operators AND and OR in decision structures.

#### Assignments

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post 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
Complete Practice Quiz	
Submit Assignment 3	Sunday 11:59 PM EST/EDT

### Module 4      **Repetition Using Looping Structures**

#### Objectives

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

- Explain the structure and types of a looping constructs used in program logic.
- Develop programs that use counter-controlled and sentinel-controlled loops.
- Explain some common looping mistakes and how to avoid them.
- Explain and identify common loop applications.

#### Assignments

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post 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
Review Key Terms	

be able to:

Submit Assignment 4	Sunday 11:59 PM EST/EDT
Complete Midterm Exam	Sunday 11:59 PM EST/EDT

## Module 5

### Arrays

#### Objectives

When you complete this module, you should

- Describe arrays and how they occupy computer memory.
- Create, use, and manipulate arrays using program logic.
- Use loops to manipulate arrays.

#### Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post 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
Complete Practice Quiz	
Submit Assignment 5	Sunday 11:59 PM EST/EDT

## Module 6

### File Handling and Applications

**Objectives**

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

- Describe the meaning, types, and applications of computer files
- Describe the common operations performed on files in programs
- Differentiate between sequential and random access files and describe their practical applications

**Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post 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
Complete Practice Quiz	
Submit Assignment 6	Sunday 11:59 PM EST/EDT

**Module 7**

**Object-Oriented Programming**

**Objectives**

When you complete this module, you should

- Describe the basic principles of object-oriented programming.
- Describe a given problem in terms of classes and objects, and develop program logic to solve the problem using object-oriented programming principles.
- Use of class diagrams to organize and document object-oriented programs.
- Describe and explain the advantages of object-oriented programming.

**Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post 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
Complete Practice Quiz	
Submit Assignment 7	Sunday 11:59 PM EST/EDT

be able to:

**Module 8**                      **Event-Driven Programming**

**Objectives**

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

- Describe the basic principles of event-driven programming.
- Describe the actions that GUI components can initiate and the principles of designing GUIs.
- Describe the steps to developing an event-driven application.
- Describe and explain the concepts behind multithreading and creating animations.

**Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post 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
Review Key Terms	
Submit Assignment 8	Sunday 11:59 PM EST/EDT
Complete Final Exam	Sunday 11:59 PM EST/EDT