

## **CST251 - Advanced Programming Concepts**

### **(3 credit hours)**

### **Course Syllabus**

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### **Course Description**

This course will continue with concepts of using a programming language introduced in the CST201 Programming course. The course will focus on advance programming techniques building on the basic ideas of programming. This will include building and incorporating in programming code, various array types and other advance data structures, understanding and building objects and using objects and classes built with objects. The student will also build a graphical user interface (GUI) within a coded program. The idea of recursion will be explained, and exception handling will be reiterated. This course will qualify a student to sit for the Microsoft 98-381 Intro to Programming Using Python certification exam through the Microsoft Corporation to obtain a Microsoft Technology Associate (MTA) certification or other comparable certification.

### **Course Learning Outcomes**

By the end of this course, you will be able to:

1. Explore and design various advanced data structures in a programming language.
2. Build a software program using programming code and advanced data structures.
3. Identify elements of programming language.
4. Investigate advanced object-oriented programming.
5. Build and code a graphical user interface (GUI) in a programming language.

### **Prerequisites/Corequisites**

CST201 or concurrent

### **Required Textbook(s) and Resources**

Required Resources:

Gaddis, T. (2023). Starting out with Python (6th ed.) Pearson/Prentice Hall.

A digital version of your book is included automatically in your course. You can access it through the Pearson Revel tool in Moodle.

Be sure to also review the weekly **Explore** sections for additional library or web resources. For access to databases, research help, and writing tips, visit the [Tiffin University Library](#).

## Time Commitment

Effective time management is a critical element to your academic success. To do well in this class plan your time wisely to maximize your learning while completing assignments. Because of our accelerated, seven-week term, TU online courses are designed with the expectation that you dedicate a little over **six (6)** hours per credit hour to course activities and preparation **each week**. For successful completion of a three-credit, seven-week online course you should reserve roughly **twenty (20) hours per week**.

To help plan your time and keep on track toward successful course completion, note the distinctive rhythm of assignment due dates:

1. All times assume Eastern Time (GMT-4).
2. Weeks begin at 12:00 a.m. ET on Monday and end at 11:55 p.m. ET on Sunday.
3. Unless otherwise noted, initial assignments or discussion posts are due by **11:55 p.m. ET on Wednesdays**.
4. Additional assignments or follow-up discussion posts are due by **11:55 p.m. ET on Saturdays, and**
5. Major assignments and reflections are typically due by **11:55 p.m. ET on Sundays**.

## Learning Activities

Assessments for this course consist of six discussion forums; weekly lab assignments; four Python programs; a mid-term; and a final exam. Read all instructions carefully.

## Grading

The chart below identifies the individual contributions from each type of activity, per week.

Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Total
Discussions	25	25	25	25	25	25	--	<b>150</b>
Labs	30	20	30	30	30	30	20	<b>190</b>
Programs	--	100	100	--	100	--	100	<b>400</b>
Exams	--	--	--	120	--	--	140	<b>260</b>
Total	55	145	155	175	150	55	260	<b>1000</b>

## Grading Scale

A: 90-100% | B: 80-89% | C: 70-79% | D: 60-69% | F: <60%

## Course Outline and Weekly Checklist

Topic	Learning Activities (Due by 11:55 p.m. ET on day designated)
Start Here	<input type="checkbox"/> MON: Activity 1.1: Course Anticipation
Week 1: Lists & Tuples	<input type="checkbox"/> WED: Activity 1.2 (Forum 2): Data Structures <input type="checkbox"/> SAT: Forum Responses (Activities 1.1 and 1.2) <input type="checkbox"/> SUN: Activity 1.3: Chapter 7 Lab Assignments <input type="checkbox"/> Begin Program 1 (due Week 2)
Week 2: Advance String Concepts	<input type="checkbox"/> WED: Activity 2.1: Python Program Lists (Program 1) <input type="checkbox"/> WED: Activity 2.2: String Methods <input type="checkbox"/> SAT: Forum Responses <input type="checkbox"/> SUN: Activity 2.3: Chapter 8 Lab Assignments <input type="checkbox"/> Begin Program 2 (due Week 3)
Week 3: Dictionaries and Sets	<input type="checkbox"/> WED: Activity 3.1: Dictionaries and Sets <input type="checkbox"/> SAT: Forum Responses <input type="checkbox"/> SUN: Activity 3.2: Chapter 9 Lab Assignments <input type="checkbox"/> SUN: Activity 3.3: Files & Multidimensional Lists (Program 2)
Week 4: Classes	<input type="checkbox"/> WED: Activity 4.1: Object-Oriented Programming <input type="checkbox"/> THU: Activity 4.2: Midterm Exam <input type="checkbox"/> SAT: Forum Responses <input type="checkbox"/> SUN: Activity 4.3: Chapter 10 Lab Assignments <input type="checkbox"/> Begin Program 3 (due Week 5)
Week 5: Inheritance (Classes and Subclasses)	<input type="checkbox"/> WED: Activity 5.1: Inheritance and Polymorphism <input type="checkbox"/> SAT: Forum Responses <input type="checkbox"/> SUN: Activity 5.2: Chapter 11 Video Lab <input type="checkbox"/> SUN: Activity 5.3: Classes and Objects (Program 3)

Topic	Learning Activities (Due by 11:55 p.m. ET on day designated)
Week 6: GUI	<input type="checkbox"/> WED: Activity 6.1: GUI Design Techniques <input type="checkbox"/> SAT: Forum Responses <input type="checkbox"/> SUN: Activity 6.2: Chapter 13 Video Lab <input type="checkbox"/> Begin Program 4 (due Week 7)
Week 7: Recursion	<input type="checkbox"/> THU: Activity 7.1: GUI Interface (Program 4) <input type="checkbox"/> SAT: Activity 7.2: Chapter 12 Lab Assignments <input type="checkbox"/> SUN: Activity 7.3: Final Exam

## Tips for Success

Online learning requires self-discipline and self-direction. As seekers of the truth, we should be willing to challenge one another's academic work in a spirit of respectful comradery. Your course is a place for you to grow as you benefit from the expertise, experience, and diverse perspectives of your instructor and peers. Constructive feedback will challenge you to stretch your own thinking, thereby expanding your knowledge and understanding.

To get the most out of your learning experience, you should actively engage (participate) in **ALL** course activities. Course elements are arranged chronologically. To complete a week, simply work your way "down the page" through all of the course materials and activities.

## For More Information:

Be sure to review the [Support, Policies, and Procedures](#) addendum.