

CSCI 3303 –Fundamentals of Programming

Class Schedule: Thursday 7:00pm – 9:50 pm

Instructor: Dr. Lisa Lacher

Office: Delta 149

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Blackboard: will be used to display syllabus, assignments and grades

Office Hours: Wednesdays from 3:00-7:00 pm

Thursdays from 2:00-4:00 pm

Please call/email before you come, especially if you are coming from far away!

TA:

TA email:

TA Office Hours: ?days – ?am-?pm

?days – ?pm-?pm

Also, by appointment...just email

Prerequisites: A programming language



This course has been authorized by UHCL as an Applied Critical Thinking (ACT) Course which means that in addition to learning about the specified course content, students will be engaged with some or all of the Elements of Thought and Universal Intellectual Standards of critical thinking. The objective of an ACT course is to develop the student's ability to become skilled at analysis and evaluation by applying a set of intellectual tools that may be effectively used across all disciplines (as well as to the student's personal life). Based on the Foundation for Critical Thinking model (<http://www.criticalthinking.org/>), critical thinking involves thinking for a *purpose*, asking *questions*, using *information*, applying *concepts*, drawing *inferences and conclusions*, identifying *assumptions*, anticipating *implications and consequences*, and recognizing *points of view*. The Universal Intellectual Standards that are applied to these Elements of Thought of critical thinking in order to develop Intellectual Traits include *clarity*, *accuracy*, *precision*, *relevance*, *depth*, *breadth*, *logic*, *significance*, and *fairness*.

Course Materials:

1. **Textbook** – Starting Out With Python 3rd Edition by Tony Gaddis
2. **Class Handouts/Overheads/Slides/Articles/Assignment Instructions/Tools and Tutorials:** Available through Blackboard (<https://blackboard.uhcl.edu/webapps/login/>)

Course Description:

This course is an introduction to the concepts of programming and data structures for non-computing majors, including understanding high quality programming, programming structures, lists, file handling, string handling, dictionaries, sets, and GUI's.

Information Technology Professionals and Critical Thinking:

Organizations of every kind are dependent on information technology and need to have appropriate, secure, working systems in place. Information Technology Professionals understand both hardware and software and use Critical Thinking help solve whatever computer-related problems organizations might have. These problems range from selecting the appropriate hardware and software products for an organization, to integrating these products within the existing infrastructure and giving consideration to organizational needs, to installing, customizing, and maintaining those applications for the organization's users. Although an IT pro needs many skills, this class focuses on solving problems using programming tools which allows the IT pro to create, customize and maintain applications.

These applications first require analysis of the problem: What does the user want? What is the problem asking for? Is everything the user is asking for relevant to the problem solution? What information do I have and what information do I yet need to solve the problem? What processing does the program need to do? What output is acceptable? etc. Next, logical designs are made that focus on information, assumptions, choices of implementation, and consequences. Understanding the basic concepts and data structures of programming languages will assist in designing and implementing solutions. Once a solution is implemented, then the results must be checked for accuracy. As you can see, critical thinking is present and important in every step.

Student Learning Outcomes (SLOs):

Upon completion of this course, students will be able:

1. To *clearly* describe the *purpose* of basic **datatypes**.
2. To understand and apply *relevant decision making concepts* by utilizing *information* gleaned from basic programming problems in order to *accurately* create solutions to the problems.
3. To understand and apply *relevant looping concepts* by utilizing information gleaned from basic programming problems in order to *accurately* create solutions to the problems.

4. To *clearly* describe the *purpose* of modularization and to *accurately* create solutions using **functions** to basic programming problems.
5. To *clearly* describe the *purpose* of **lists** and to *accurately* use them in the course by creating solutions to basic programming problems.
6. To understand and apply *relevant* **string** manipulation techniques to *accurately* create solutions to basic programming problems.
7. To create solutions to basic programming problems using *relevant* text and binary **file handling** techniques.
8. To *clearly* describe the *purpose* of **dictionaries** and to *accurately* use them in the course by creating solutions to basic programming problems.
9. To *clearly* describe the *purpose* of **sets** and to *accurately* answer set questions.
10. To understand **GUI concepts** and create solutions to basic programming problems using *relevant* GUI components.

Fundamental and Powerful Concepts of the Course:

This course contains several concepts that form the foundation for much of what we do throughout the semester. Through these fundamental and powerful concepts, you will be able to see the connections and themes that run throughout much of the course. Three of these include:

1. What precisely is the problem that needs solving?
2. How can we design a program to help us find solutions to problems that can be better solved using a program?
3. What programming tools are available using Python that will assist in solving this problem?

Vocabulary of Critical Thinking:

In this course, we will learn and use the vocabulary of critical thinking. Our critical thinking vocabulary will include an understanding and use of both the elements of thought and the universal intellectual standards.

Elements of Thought* In this course, we will consider and use 8 elements of thought:

1. Purpose – goals, objectives
2. Question at Issue – problem, issue
3. Information – data, facts, reasons, observations, experiences, evidence
4. Interpretation and Inference – conclusions, solutions
5. Concepts – theories, definitions, laws, principles, models
6. Assumptions – presuppositions, axioms, taking for granted
7. Implications and Consequences
8. Point of View – frames of reference, perspectives, orientations

Universal Intellectual Standards* In this course, we will consider and use 9 universal intellectual standards:

1. Clarity

2. Accuracy
3. Precision
4. Relevance
5. Depth
6. Breadth
7. Logic
8. Significance
9. Fairness

*Source: Richard Paul and Linda Elder, Center for Critical Thinking and Foundation for Critical Thinking.

Critical Thinking Activities:

There will be three course activities that are targeted as critical thinking activities:

1. To address SLO 2: The decision programming homework assignment will require the student to understand and apply a relevant decision concepts by utilizing information gleaned from the homework problem in order to accurately create a solution to the problem.
2. To address SLO 3: The looping programming homework assignment will require the student to understand and apply a relevant looping concept by utilizing information gleaned from the homework problem in order to accurately create a solution to the problem.
3. To address SLO 4: Quiz questions will require the student to clearly describe the purpose and benefits of modularization and demonstrate a clear conceptual understanding of functions by designing a solution to a small programming problem that requires a function to be used in the solution.

4 C's of Critical Thinking:

The UHCL Quality Enhancement Plan (QEP) endorsed by the university accrediting body is a plan to promote applied critical thinking (ACT) for lifelong learning and adaptability. In particular, the key learning outcomes of the UHCL applied critical thinking plan involve 4 C's: Curiosity, Connections, Creativity, and Communication. In this course, we will primarily focus on making connections to a particular issue or problem: students will use established programming methodologies to design and test program solutions.

Assessment of Critical Thinking:

Individual grades will be given on each of the 2 Critical Thinking Activities. The grades will be converted into Excellent, Acceptable, and Unacceptable. For each of the activities, the conversions will

1. SLO 2: A grade between 90% and 100% on the decision programming homework assignment will be considered Excellent, between 75% and 89% will be considered Acceptable, and between 0 and 74% will be considered Unacceptable
2. SLO 3: A grade between 90% and 100% on the looping programming homework assignment will be considered Excellent, between 75% and 89% will be considered Acceptable, and between 0 and 74% will be considered Unacceptable

3. SLO 4: A grade between 90% and 100% on Quiz Questions over modularization be considered Excellent, between 70% and 89% will be considered Acceptable, and between 0 and 69% will be considered Unacceptable.

The three assessments will be combined for an overall determination of Excellent, Acceptable, or Unacceptable. These assessments will be used as input to the UHCL Critical Thinking database for internal assessment of Critical Thinking, and will not further affect your grade in this course.

Student Expectations:

Expect to spend 6-9 hours a week on this class. In this course students are expected to always attend class and be on time. Students will read the material from the textbook, work all assigned classwork and homework, and take occasional quizzes. Classes will consist of lecture, demonstrations, and working examples.

Every student is expected to work on their assignments alone. Cheating will not be tolerated. Any student caught cheating or attempting to cheat will be given a zero on the assignment or the exam. Repeat offenders will be given an F for the course and may suffer expulsion from the university. All work must be your own. You may discuss the material in the course and help one another, however, we expect any work you hand in for a grade to be your own. Plagiarism will result in, at best, an "F" for the assignment.

Academic Honesty:

The honesty policy that is defined in the UHCL Honesty Code states:

I will be honest in all my academic activities and will not tolerate dishonesty.

Students are expected to show respect for themselves and others by being honest in their educational pursuits. Academic dishonesty will result in a grade penalty and an academic dishonesty notice placed in your file. Upon two honesty violations, students may be expelled from UHCL.

Disability Services:

Any individual with a disability who requires a special accommodation should inform me and contact the Disability Services Office, Room 1402 in the Bayou Building, or call 281.283.2627.

Assignments

All assignments are due by 11:59 PM on the assigned date. Assignment submissions should be completed through Blackboard or via email as instructed.

Quizzes

There will be 6 random quizzes throughout the course; however, only 5 quiz grades will be counted. Your lowest quiz score will be dropped.

Exams

There will be 2 exams throughout the course. The final exam is comprehensive.

Evaluation Policy

Assignment Type	Total
Assignments	35%
Quizzes	10%
Midterm Exam	20%
Final Exam	30%
Participation	5%

Grading Scheme

A	94-100%
A-	90-93%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D+	67-69%
D	63-66%
D-	60-62%
F	59% or below

Tentative Schedule

Class (date)	Topic	Readings/Materials	Deliverables
1 (8/31)	Welcome and Syllabus Course Overview and Getting Started with IDLE and Python, Data Types and reading input from the keyboard	Ch. 1 & 2	
2 (9/7)	Making Decisions (if statements)	Ch. 3	
3 (9/14)	Looping	Ch. 4	Assignment 1 Due
4 (9/21)	Functions	Ch. 5	Assignment 2 Due
5 (9/28)	Files	Ch. 6	Assignment 3 Due
6 (10/5)	Lists and Tuples	Ch. 7	Assignment 4 Due
7 (10/12)	Worksheet Day and Review		Assignment 5 Due
8 (10/19)	Midterm Exam	Chapters 1-7	
9 (10/26)	More on Strings	Ch. 8	
10 (11/2)	Dictionaries and Sets	Ch. 9	Assignment 6 due
11 (11/9)	More on Dictionaries and Sets		Assignment 7 due
12 (11/16)	GUIs	Ch. 13	
13 (11/23)	Thanksgiving		
14 (11/30)	More on GUIs and Intro to OO	Ch. 10	Assignment 8 due
15 (12/7)	Worksheet Day and Review		Assignment 9 Due
16 (12/14)	Final Exam	Comprehensive	