

WASHINGTON AND LEE UNIVERSITY

CSCI 112 – Fundamentals of Programming II – Fall 2020

Course Information

Instructor: Taha Khan	Email: tkhan@wlu.edu (Preferred)	Office: 540-458-4861
		Cell: 631-790 0553 (Emergency Only)
Office Hours: 10 am to 11 am M/W/F (or by appointment)	Location: Parmly 406	
Lecture: 8:30 am to 9:30 am M/W/F in Parmly 307	Lab: 8 am to 11 am TR in Parmly 405	

Overview

This is a second course in computer science that expands on various programming fundamentals that students have learned in CSCI-111. The course will continue to cover some of the main programming concepts which include the data structures, object-oriented programming, basic algorithms, and complexity analysis. The course will take a hands-on learning approach with a combination of lectures and labs to cover topics in detail and provide students with sufficient programming experience. This course will be taught in version 3 of the Python programming language.

Learning Objectives

- Develop a comprehensive understanding of commonly used collections and data structures such as arrays, linked lists, stacks, queues, heaps, trees, and graphs.
- Understand the fundamentals of object-oriented programming (OOP) and its underlying concepts of inheritance, abstraction and polymorphism.
- Design custom data structures/types using OOP in Python.
- Learn about introductory searching and sorting algorithms.
- Apply complexity analysis to determine space/time efficiency of algorithms and data structures.

Textbook



Fundamentals of Python: Data Structures, by Kenneth A. Lambert (2nd Edition)
(Cengage Learning, 2019, ISBN 978-1-337-56009-2).

Copies for this book are available at the W&L university store and can be ordered [online](#).

Grading Criteria

- Lab Projects (12) - 50%
- Quizzes (2) - 20%
- Comprehensive Final Exam (1) - 20%
- In Class Activities - 10%
- Bonus Opportunities - up-to 5%

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Lab Projects: There will be a total of 12 lab projects. Students will be required to complete the labs within their allocated time slots.

In Class Activities: There will be regular in class participation activities. To obtain credit, students should be present in-class unless due to an exception, approved by the instructor.

Quizzes: There will be a total of 2 hourly quizzes. These quizzes will be released on Canvas. They will be mutually exclusive and will cover different modules of the course.

Final Exam: There will be one final exam conducted during finals week. This will be comprehensive and will cover the complete course materials.

Note on Letter Grades: Course grades will be assigned based on a relative curve. Bonus points will be awarded after grade cut-offs have been determined.

Materials and Communications

All course materials will readily be made available on the course Canvas. Canvas will also be used for all class announcements as well as academic course discussions, in which students are encouraged to participate in. Grades, submissions and re-grade requests will also be handled via Canvas.

The best way to reach out regarding any concerns/logistics is via email. I will respond to all emails within 48 hours. In the case of an emergency, you may contact me on my cell, provided in the course information section.

Attendance and Classroom Etiquette

It is very important that you attend lectures. There will be considerable information given in lectures that is not available elsewhere. You should come to lectures and labs prepared to participate in discussions. There will be graded activities in class that will require students to attend classes to avail points.

Attendance at labs is mandatory. The only excuses for missing a lab are medical and other serious emergencies. If you miss a lab without an excuse approved by the instructor, you will receive a grade of 0 for that lab. Excuses must be submitted to me before the lab, if possible.

Be respectful of your classmates and the instructor. The use of laptops and mobile computing devices are permitted during class as long as they are being used for the course, such as for taking notes and locating information related to the course. These devices are NOT to be used during class for texting, phone calls, reading email, social networking, completing assignments for other courses, or shopping.

Academic Integrity

All quizzes and exams are to be completed online. They need to be and completed individually and pledged. Students are allowed to discuss programming problems among themselves during the labs, however the programs should be their own work, unless otherwise specified (as when you do pair programming).

The use code from the PowerPoint slides, examples provided in the class or from the textbook for the course is permitted. It is not permitted for students to use the work of their classmates, former students, friends, or having anyone else write programs for them. The term “use” specifically means turning in the work of others as one’s own, or even casting eyes upon the work of others with a view to incorporating their solutions into an individual’s own work.

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Deliberate concealment of sources constitutes plagiarism and will result in a failing grade for the course and a report to the EC. Deliberately providing solutions to other students, either verbally or in writing, via hardcopy or electronic transmission, will result in a failing grade for the course and a report to the EC. In particular, you may not share your work until the deadline to hand in material has passed. Students should familiarize themselves with the University's [policy on plagiarism](#).

Accommodations

Washington and Lee University makes reasonable academic accommodations for qualified students with disabilities. All undergraduate accommodations must be approved through the Office of the Dean of the College. Students requesting accommodations for this course should present an official accommodation letter within the first two weeks of the (fall or winter) term and schedule a meeting outside of class time to discuss accommodations. It is the student's responsibility to present this paperwork in a timely fashion and to follow up about accommodation arrangements. Accommodations for test-taking should be arranged with the instructor at least a week before the date of the test or exam.

Religious Holidays

Any student who is unable, because of his/her religious holiday(s), to attend classes or to participate in any examination or study on a particular day shall be provided an opportunity to satisfy the requirement in a timely manner or shall be excused from the requirement. Undergraduate students should reach out to their faculty member within the first two weeks of class in fall or winter term, two days in spring term, and again prior to the religious holiday to discuss how best to make up the missed requirement.

Academic Deadlines

For all university specific deadlines, refer to the Washington and Lee University registrar [website](#).

Academic Resources

Washington and Lee University provides a multitude of academic resources for students to support their education and learning. Visit the following [link](#) for more information.

Course/Teaching Evaluations

Course evaluations provide valuable feedback for instructors to improve their teaching methods and philosophy. Students are encouraged to submit their evaluations at the end of the term.

Covid-19 Accommodations

The course is primarily designed for in-person instruction, however both students and faculty are required to adhere to all Covid-19 specific guidelines provided by the University. Any student who may not be able to attend class in-person should contact the instructor to make necessary arrangements for attending the class/lab remotely. There is a possibility that the course may switch over to online instruction (in-part or full). Students should also be prepared for remote instruction to ensure the safety of all students and the instructor.

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Course Schedule

Week #	Day	Topic
Week 1	Mon, Aug 24	Introductions, Overview and Course Tools
	Wed, Aug 26	Python Collections
	Thu, Aug 27	Lab 1
	Fri, Aug 28	Developing with Classes
Week 2	Mon, Aug 31	Searching and Sorting
	Wed, Sep 2	Complexity Analysis
	Thu, Sep 3	Lab 2
	Fri, Sep 4	Memory Management & Recursion
Week 3	Mon, Sep 7	No Class – Labor Day
	Wed, Sep 9	Arrays
	Thu, Sep 10	Lab 3
	Fri, Sep 11	Linked Structures
Week 4	Mon, Sep 14	Interfaces
	Wed, Sep 16	Iterators
	Thu, Sep 17	Lab 4
	Fri, Sep 18	Quiz Review
Week 5 – Quiz 1	Mon, Sep 21	Inheritance
	Wed, Sep 23	Equality
	Thu, Sep 24	Lab 5
	Fri, Sep 25	Stacks - Introduction
Week 6	Mon, Sep 28	Stacks - Applications
	Wed, Sep 30	Stacks - Backtracking
	Thu, Oct 1	Lab 6
	Fri, Oct 2	Queues - Introduction
Week 7	Mon, Oct 5	Queues - Array Implementation
	Wed, Oct 7	Queues - Applications
	Thu, Oct 8	Lab 7
	Fri, Oct 9	Lists - Introduction
Week 8	Mon, Oct 12	No Class - Columbus Day
	Wed, Oct 14	Lists - Implementation/Iterators
	Thu, Oct 15	Lab 8
	Fri, Oct 16	Quiz Review
Week 9 - Quiz 2	Mon, Oct 19	Linked Lists
	Wed, Oct 21	Doubly Linked Lists
	Thu, Oct 22	Lab 9
	Fri, Oct 23	Trees - Introduction
Week 10	Mon, Oct 26	Trees - BSTs & AVLs
	Wed, Oct 28	Trees - Parsing
	Thu, Oct 29	Lab 10
	Fri, Oct 30	Heaps
Week 11	Mon, Nov 2	Sets and Dictionaries
	Wed, Nov 4	Graphs - Introduction
	Thu, Nov 5	Lab 11
	Fri, Nov 6	Graphs - Traversal
Week 12	Mon, Nov 9	Graphs - Dijkstra's Algorithm
	Wed, Nov 11	No Class – Veterans Day
	Thu, Nov 12	Lab 12
	Fri, Nov 13	Final Review and Conclusion
Week 13 - Finals Week		

Disclaimer: This syllabus is tentative and may be subject to change based on the discretion of the instructor, if circumstances beyond control require