

Data Structures and Algorithms

COP3530 Section 7303, 7388

Location: Little Hall, 0109

Academic Term: Summer C 2018

-

Instructor:

Cheryl Resch

Cheryl.resch@ufl.edu

443-223-3562

Office Hours: Friday 9:30-10:30, Wednesday 12:30-1:30

Office Location: CSE E508

TA:

Amanpreet Kapoor

kapooramanpreet@ufl.edu

352-530-9138

Office Hours: Friday 12:30-2:30 pm

Office Location: CSE E312

Course Description

Algorithm development using pseudo languages, basic program structures, program design techniques, storage and manipulation of basic data structures like arrays, stacks, queues, sorting and searching and string processing. Linked linear lists. Trees and multilinked structures.

4 Credit Hours

Course Pre-Requisites

COP 3504 or COP 3503 with minimum grade of C, COT 3100, and MAC 2234, MAC 2312, MAC 3473 or MAC 3512.

Course Objectives

This course covers implementation and use of data structures for use in problem solving. In particular, lists, stacks, queues, trees, tables and graphs will be covered. Algorithm development including recursive techniques will be covered. Sorting algorithms will be covered. Students will learn to solve problems using data structures and choose how those data structures will be implemented.

By the end of the semester, students should be able to

- Choose and implement data structures for solving problems based on their functions and situational appropriateness of application
- Choose an algorithm for solving a problem based on its computational complexity and appropriateness of application
- Use an abstract data type to describe a data structure

Materials and Supply Fees

N/A

Professional Component (ABET):

This course is used to assess program outcomes for these ABET criteria:

a) an ability to apply knowledge of mathematics, science and engineering

e) an ability to identify, formulate, and solve hardware and software

computer engineering problems, accounting for the interaction

between hardware and software

k) an ability to use the techniques, skills, and modern engineering tools necessary for computer engineering practice

Required Textbooks and Software

- Data Structures and Algorithm Analysis in C++
- Mark Allen Weiss
- 4e, 2014
- 978-0-13-284737-7

The textbook is available in eBook form in Canvas.

Course Schedule

Week 1:	Computational Complexity and Algorithm Analysis / Chapter 2 / Quiz 1
Week 2:	Lists, Stacks and Queues / Chapter 3/ Quiz 2
Week 3/4:	Trees, Tree Traversals, Binary Search Trees /Chapter 4.1-4.3/Quiz 3/Exam 1
Week 5: 12.2/Quiz 4	AVL Trees, Splay Trees, B-Trees, Red-Black Trees/Chapter 4.4-4.7,
Week 6:	Hashing / Chapter 5 / Quiz 5 /Programming Project 1
Week 7:	Heaps and Priority Queues / Chapter 6 / Quiz 6
Week 8:	Sorting / Chapter 7 / Quiz 7
Week 9 :	Review / Exam 2 /Sorting Analysis Project
Week 10:	Graphs / Chapter 9 / Quiz 8
Week 11:	Greedy Algorithms / Chapter 10.1 / Quiz 9/Programming Project 2
Week 12:	NP Completeness / Chapter 9.7 / Final Exam

Attendance Policy, Class Expectations, and Make-Up Policy

Exams are held in the lecture hall and require the use of Respondus Lockdown Browser.

Exams may be made up when student has an excused absence.

Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> (Links to an external site.)Links to an external site.) and require appropriate documentation.

Programming Assignments may be turned in late with a penalty of 10% per day up to 4 days late.

Quizzes are given during discussion period and cannot be made up.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Programming Assignments (2)	100 each	30%
Sorting Analysis	100	10%
Quizzes (10)	10 each	10%
Exams (2)	50	30%
Final Exam	100	20%
		100%

Grading Policy

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx> (Links to an external site.)
[Links to an external site.](#)

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals> ([Links to an external site.](#))[Links to an external site.](#). Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/> ([Links to an external site.](#))[Links to an external site.](#).

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html> (Links to an external site.)[Links to an external site.](#)

Campus Resources:

-

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc> (Links to an external site.)[Links to an external site.](#), and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/> (Links to an external site.)Links to an external site..

-

Academic Resources

-

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml> (Links to an external site.)Links to an external site..

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/> (Links to an external site.)Links to an external site..

Library Support, <http://cms.uflib.ufl.edu/ask> (Links to an external site.)Links to an external site.. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <https://teachingcenter.ufl.edu/> (Links to an external site.)Links to an external site..

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/> (Links to an external site.)Links to an external site..

Student Complaints Campus:

https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf (Links to an external site.)Links to an external site..

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process> (Links to an external site.)Links to an external site..

Date	Module / Subject	Assignment	Readings	Exam
May 14-18	Intro, Module 1 – Computational Complexity and Algorithm Analysis		Weiss, Chapter 2	
May 21-25	Module 2 - Lists, Stacks and Queues		Weiss, Chapter 3	
May 30, June 1	Module 3.1 - Trees, Tree Traversals, Binary Search Trees		Weiss, Chapter 4.1-4.3	
June 4, 6	Review, Exam 1			Exam 1 June 6
June 8, 11-15	Module 3.2 - AVL Trees, Splay Trees, B-Trees, Red-Black Trees		Weiss, Chapter 4.4-4.7, 12.2	
June 18-20	Module 4 - Hashing		Weiss Chapter 5	
June 20-22	Module 5 - Heaps and Priority Queues		Weiss Chapter 6	
July 2, 6, 9	Module 6 - Sorting		Weiss Chapter 7	Quiz on Hash Tables 3 July Quiz on Heaps 10 July
July 16, 18	Review, Exam			Exam 2 July 18
July 11, 13, 20, 23	Module 8 - Graphs		Weiss Chapter 9	Sorting Analysis Due 7/23
July 25, 30, Aug 1	Module 9 - Greedy Algorithms		Weiss Chapter 10.1	
Aug 3, 6	Module 10 - NP- Completeness		Weiss Chapter 9.7	Programming Assignment Due Aug 6
Aug 8, 10	Review, Final Exam			Final Exam Aug 10

