Data Structures & Algorithms
COP 3530 Section 12712, 28440
Academic Term: Fall 2020

Instructor
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> Office Hours: TBD

Teaching Assistants/Peer Mentors
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Course Description
This course covers 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 / Co-Requisites
(COP 3504 or COP 3503) and COT 3100 and (MAC 2234 or MAC 2312 or MAC 2512 or MAC 3473), all with a minimum grade of C.

Course Objectives
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 the application
- Choose an algorithm for solving a problem based on its computational complexity and appropriateness of the application
- Use an abstract data type to describe a data structure

Professional Component (ABET)
This course is used to assess program outcomes for these ABET criteria:
- an ability to design hardware and software systems, components or processes to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- an ability to identify, formulate, and solve hardware and software computer engineering problems, accounting for the interaction between hardware and software
- an ability to use the techniques, skills, and modern engineering tools necessary for computer engineering practice

Required Textbooks and Software
- Tools: Canvas, Slack, G++ compiler, Zoom, and Stepik

Recommended Materials (Optional)
- Textbook: Data Structures and Algorithm Analysis in C++
  - Mark Allen Weiss
  - Fourth edition, 2014, ISBN 9780132847377
- OpenDSA Book: https://opendsa-server.cs.vt.edu/ODSA/Books/Everything/html/index.html

Course Schedule

Week	Dates		Topic	Deadlines
1	31-Aug	6-Sep	Algorithm Analysis	Q1
2	7-Sep	13-Sep	List, Stacks, & Queues	Q_2
3	14-Sep	20-Sep	Trees & Traversals	Q_3
4	21-Sep	27-Sep	Balanced Trees 1	Q_4
5	28-Sep	4-Oct	Balanced Trees 2/ Heaps & Priority Queues	Q_5, P_1 (2-Oct)
6	5-Oct	11-Oct	Sorting	Q_6
7	12-Oct	18-Oct	Exam 1	Q_7, E_1 (15-Oct)
8	19-Oct	25-Oct	Sets, Maps, & Hashing	H_1 (25-Oct)
9	26-Oct	1-Nov	Graphs 1	Q_8
10	2-Nov	8-Nov	Graphs 2	Q_9
11	9-Nov	15-Nov	Greedy Algorithms	Q_{10}, P_2 (11-Nov)
12	16-Nov	22-Nov	Exam 2	Q_{11}, E_2 (19-Nov)
13	23-Nov	29-Nov	Break	
14	30-Nov	6-Dec	Dynamic Programming	H_2 (6-Dec)
15	7-Dec	9-Dec	Complexity Theory	Q_{12}, P_3 (7-Dec)
Legend: Q_N = Quiz, P_N = Project N, E_N = Exam N, H_N = Hire Thy Gator				

Evaluation of Grades

Assignment	Weightage	% of Final Grade
Quizzes (12, Drop Lowest 2)	2% x 10	20%
Exam 1	18%	18%
Exam 2, Cumulative	20%	20%
Projects (3)	10% x 3	30%
Participatory Activities: Coding Exercises, Hire Thy Gator	6% + 6%	12%
Extra Credit Opportunities	Up to 3%	3%
		Total: 103%

Grading Policy

Percent	Grade	Grade Points
93.4 - 103	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: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Make-Up and Late Submission Policy

- No make-up or late submission allowed on weekly quizzes. Remember we drop the two lowest scores.
- Projects submitted late will be penalized by **10% each day up-to four days**. After the fourth day, you will get a 0. We also count weekends as regular days. So, if an assignment is due Friday, and you submit on Sunday, you will be graded out of 80 instead of 100 (2 days late penalty).
- Exams may be made up when a student has an excused absence. These absences must be notified to the Instructor at least 72 hours before the exam. Excused absences must be consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation. Please note that there is no guarantee that requests will be accommodated.
- Waiver of penalty for late submission of projects is allowed for up-to three days per semester. All such requests regarding a need for an extension without penalty must be made at least 72 hours before the due date of the assignment and not after the deadline has passed. Only one such request is allowed and for further requests you need to provide support documentation.

Grade Review

After one week of posting a grade, no revisions will be made. In the event of a grade review, the entire assignment will be reviewed.

Class Expectations

- Quizzes will require Stepik and Canvas.
- Exams will be proctored on Proctor U.
- C++ is the programming language that will be used throughout the course. You will be coding using C++ 11 in all quizzes and Projects 1 and 3. For the Project 2, you can use languages listed in the project description.
- Strive for correctness, clean, readable, tested, and documented code throughout the course and not for optimization. Correctness and readability are the goals for this course. Once you have the correct solution then optimize if you want.
- Make sure your code compiles on Stepik for Quizzes and Projects 1 and 3. If you prefer to code in an IDE, you are welcome to use one but ensure that your code compiles on Stepik (it is the default autograder for quizzes). The Stepik autograder uses a g++ compiler by default so most of the time your code will work.
- For the exams, you can use C++ or pseudo code to describe your solution to a given problem.
- The course will not include Design patterns, Competitive programming, or Formal proofs. The Instructor or the course staff will answer questions on the former topics contingent on their time or point you to additional resources. Feel free to post such questions on slack channels. If any of your classmates do post such questions, don't feel intimidated and if you don't understand it, it is perfectly natural and fine. Some students are more experienced, and everyone should strive to improve their learning not comparing to others.

Academic Dishonesty

- Sharing/copying, "borrowing" of code structure, looking at code from another student or providing such code, and plagiarism, in addition to other dishonest behaviors, are all considered to be academic dishonesty. No information regarding the project, quiz, and exam solutions may be shared by students except for a discussion at a conceptual level.
- For any conceptual discussions, cite the peer who you discussed it with or cite the internet resource you referred to. Such discussions should be held on a whiteboard using explanation figures/pseudo-codes or through talking. We strongly encourage that if you have doubts, visit the course staff in-office hours. **Looking at any piece of your peer's code, sharing files, searching for solutions found online, or using someone else to code your solution is strictly prohibited**.
- Any student found to have violated these rules, whether a provider or receiver or unauthorized help, will be given a zero on that assignment and a two-letter final grade decrement for a first offense. For a second offense, you will get an E grade, the failing grade. Also, for both offenses, you will be reported to the Honor Court. **If you aren't clear on what constitutes plagiarism, ask the course staff.**

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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-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.

Discussion and Slack Policy - Be Nice, Be Helpful
- Treat your classmates with civility and respect. Don't attack anyone and no discussion of controversial topics on channels.
- If you have a question regarding code or content, always post it on the *#questions* or **#code** channels if you want the course staff to answer. Do not be hesitant however simple is the question. You will be surprised by how many students have the same question but are hesitant to ask. We want to make sure everyone gets the basics right and we hope that you leave the course with a mastery of first principles and basics.
- Use private messaging only if the message is related to personal requests.
- Questions will be answered **Monday – Friday in less than 48 business hours typically** by at least one member of the course staff.
- Try to answer questions posted by your course mates if possible and help them. This is helpful for a vibrant environment in a remote course.
- Stepik environment allows you to see other students' solutions to coding after you have submitted and passed the test cases. Students in the previous iterations read other students' code and found it helpful. If you find that some solution is well designed, try to applaud them on slack and appreciate their work.
- Harassment/Bullying/Making fun of another student will not be tolerated and will lead to disciplinary actions. If someone is behaving disrespectfully on the forum which you find inappropriate, send the Instructor a message and don't argue on it publicly.

Office Hours and Code Review Policy
- Students should visit the course staff during scheduled office hours for help on projects or quizzes. Do not send emails or "@" instructors or TAs about project help. The TAs and instructor will often try to answer questions when possible in **#questions** or **#code** channels, but the way to get personalized help is to visit them during office hours.
- The course staff cannot provide you more than 15 minutes of their time in case of long lines or more than two students waiting to get help during office hours.
- When making any **debugging requests**, make sure you provide the context of what problem you are trying to solve and where is your code failing. Small snippets can be posted on slack but not the entire code.
- **Debugging requests** for projects/quiz questions must first go through the TAs, peer mentors, or a post on the **#code** channel on slack. This is **strongly encouraged** given we have a large class and several of you might have similar questions. If your problem is not fixed, then reach out to the Instructor.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Disclaimer

Although every effort will be made to implement all course policies as stated in this syllabus, course policies are subject to change at the discretion of the Instructor, based on unforeseen circumstances occurring during the semester or continuous feedback from the enrolled students.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Program Coordinator
• Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

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: https://registrar.ufl.edu/ferpa.html

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, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

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/.

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.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. 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/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
https://writing.ufl.edu/writing-studio/.

Student Complaints Campus: https://care.dso.ufl.edu.

On-Line Students Complaints: http://www.distance.ufl.edu/student-complaint-process.