COP 3503 Honors – Computer Science II - Fall 2020 Syllabus

Instructor: **Joseph J. LaViola Jr.**

Office: **Engineering III Room 321**
Hours: **Mon. 4:00pm – 6:00pm – Zoom only**
Wed. 5:00pm – 6:00pm – Zoom only
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If you want to email me, MAKE SURE to enter in the subject line "**cop3503h**" followed by **your name**.

Web page
http://www.cs.ucf.edu/courses/cop3503h/fall2020/

Information will be posted in Webcourses as well

This course will incorporate the BlendFlex model. This means that the face-to-face classroom sessions will take place on the days and times noted on the class schedule, but will also be recorded for remote student participation. The idea is to provide all students with continued access to learning experiences.

Please view the 3-minute BlendFlex Delivery Model UCF Student Guide video for an overview.

Use of Zoom
Lectures will also be streamed in Zoom
Lecture Recordings will be posted in Webcourses
Zoom links will be emailed to students at least a day before the Zoom class or virtual office hours event takes place.

Because of the continued remote instruction requirement due to the COVID-19 pandemic, this course will use Zoom for some synchronous ("real time") class meetings. Meeting dates and times will be scheduled through Webcourses@UCF and should appear on your calendar.

Please take the time to familiarize yourself with Zoom by visiting the UCF Zoom Guides at https://cdl.ucf.edu/support/webcourses/zoom/. You may choose to use Zoom on your mobile device (phone or tablet).

Things to Know About Zoom:

- You must sign in to my Zoom session using your UCF NID and password.

- The Zoom sessions are recorded.
- Improper classroom behavior is not tolerated within Zoom sessions and may result in a referral to the Office of Student Conduct.
- You can contact Webcourses@UCF Support at <https://cdl.ucf.edu/support/webcourses/> if you have any technical issues accessing Zoom.

Course Details

Course Objective: This course is about problem solving and devising efficient algorithms for a variety of problems in computer science. This course explores specific algorithmic techniques in more detail than CS1 and applies these to some new problems not explored in CS1. Also, more technical algorithmic analysis will be done in order to verify the efficiency of the algorithms discussed. Finally, some new data structures will be introduced.

Primary Textbook: Introduction to Algorithms, Third Edition, by Cormen, Leiserson, Rivest, and Stein, MIT Press, 2009.

Secondary Textbook: The Algorithm Design Manual, Second Edition, by Steven Skiena, Springer, 2010.

Grading: The final letter grade will be based upon the four items listed below. There will be 8 assignments that will contain written problems and programs. Each assignment will be introduced in class and then posted on the class web page. All programming assignments are to be done in Java. The grading scale will be based on the class average, standard deviation and overall difficulty of the assignments and exams. Note: plus/minus grades will be issued, when deemed appropriate.

Item	Percentage
Take Home Exam #1	25
Final Exam	30
Homework Assignments	45

In order to pass the class (get a C or higher) you must earn at least 50% on the final exam.

All sections listed in this chart refer to sections of the primary textbook. Typically, lectures will follow the material in the text, but occasionally material will be added into lectures that is NOT in the text. For this reason, class attendance is important. This is a general time frame only and is subject to the needs of the class. It will be altered without notice, but will generally follow the same progression. At the end of each class you will be told what we will be discussing during the next class period.

Late homework assignments will be accepted but will be assessed a late penalty. In particular, assignments will be accepted up to 48 hours after the due date of the assignment. If an assignment is less than 24 hours late, a 10% penalty will be assessed. If an assignment is in between 24 and 48 hours late, a 20% penalty will be assessed.

No late assignments will be accepted on the last homework assignment.

Collaboration Policy: Homework assignments will be of two types, collaborative and not collaborative and they will be clearly designated. Collaborative homeworks are intended to foster interaction in problem solving; noncollaborative homeworks are intended to test individual knowledge and are like take-home exams. To ensure safety and to minimize risk, any collaboration conducted when working on Collaborative homeworks will have to be done remotely or at a safe distance (6 feet). If you need assistance with a particular homework problem, please see the instructor. Note that Take-Home Exam 1 is NONCOLLABORATIVE!!

Required Statement Regarding COVID-19

University-Wide Face Covering Policy for Common Spaces and Face-to-Face Classes

To protect members of our community, everyone is required to wear a facial covering inside all common spaces including classrooms (https://policies.ucf.edu/documents/PolicyEmergencyCOVIDReturnPolicy.pdf. Students who choose not to wear facial coverings will be asked to leave the classroom by the instructor. If they refuse to leave the classroom or put on a facial covering, they may be considered disruptive (please see the Golden Rule for student behavior expectations). Faculty have the right to cancel class if the safety and well-being of class members are in jeopardy. Students will be responsible for the material that would have been covered in class as provided by the instructor.

Notifications in Case of Changes to Course Modality

Depending on the course of the pandemic during the semester, the university may make changes to the way classes are offered. If that happens, please look for announcements or messages in Webcourses@UCF or Knights email about changes specific to this course.

COVID-19 and Illness Notification

Students who believe they may have a COVID-19 diagnosis should contact UCF Student Health Services (407-823-2509) so proper contact tracing procedures can take place.

Students should not come to campus if they are ill, are experiencing any symptoms of COVID-19, have tested positive for COVID, or if anyone living in their residence has tested positive or is sick with COVID-19 symptoms. CDC guidance for COVID-19 symptoms is located here: (https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html)

Students should contact their instructor(s) as soon as possible if they miss class for any illness reason to discuss reasonable adjustments that might need to be made. When possible, students should contact their instructor(s) before missing class.

In Case of Faculty Illness

If the instructor falls ill during the semester, there may be changes to this course, including having a backup instructor take over the course. Please look for announcements or mail in Webcourses@UCF or Knights email for any alterations to this course.

Course Accessibility and Disability COVID-19 Supplemental Statement

Accommodations may need to be added or adjusted should this course shift from an on-campus to a remote format. Students with disabilities should speak with their instructor and should contact sas@ucf.edu to discuss specific accommodations for this or other courses.

Tentative Lecture Schedule

Week	Topic
Aug 24-28	Syllabus, Role of Algorithms, Mathematical preliminaries, Getting started with algorithm design and analysis (Chapters 1, 2, Appendix A,D)
Aug 31- Sep 4	Growth of Functions, asymptotic notation, standard notations (Chapter 3), Recurrence relations – substitution, iteration, recursion-tree and master method (Chapter 4.3 - 4.6) **Homework #1**
Sep 7-11	Divide-and-Conquer – Strassen's algorithm, maximum-subarray problem (Chapter 4.1 - 4.2) **No Class - Labor Day – Sept. 7th**
Sep 14-18	Sorting – Heapsort, QuickSort (Chapter 6, 7) Sorting in Linear time – counting sort, bucket sort, radix sort (Chapter 8) **Homework #2**
Sep 21-25	Order Statistics – min and max, selection (Chapter 9) Start Dynamic Programming – Rod cutting, matrix chain multiplication (Chapter 15.1-15.2) **Homework #3**
Sep 28 – Oct 2	Dynamic Programming – elements of dynamic programming, longest common subsequence (Chapter 15.3 –15.4)
Oct 5-9	Greedy Algorithms – activity selection, greedy strategy elements, Huffman codes (Chapter 16) **Homework #4**
Oct 12-16	**Take Home Midterm Exam** Graph Algorithms – Notation, BFS,DFS, Topological sort. Strongly connected components (Chapter 22)
Oct 19-23	Minimum Spanning Trees – Kruskal and Prim algorithms (Chapter 23)
Oct 26-30	**Withdrawal Deadline – Oct. 30th** Single Source Shortest Paths – Bellman-Ford, Dijkstra's algorithm (Chapter 24) **Homework #5**
Nov 2-6	All-Pairs Shortest Paths – Floyd-Warshall, Johnson's algorithm for sparse graphs (Chapter 25) **Homework #6**
Nov 9-13	Maximum Flow – Flow networks, Ford-Fulkerson, Maximum Bipartite Matching (Chapter 26)

	Veterans Day, Nov. 11th – No class
Nov 16-20	Randomized Algorithms (Chapter 5.4) Multithreaded Algorithms (Chapter 27) **Homework #7**
Nov 23-27	**No Class – Thanksgiving – Nov. 25th** Multithreaded Algorithms (Chapter 27) **Homework #8**
Nov 30 – Dec 4	Multithreaded Algorithms (Chapter 27)
Dec 2	**Last Day of Class – Exam Review**
FINAL EXAM	**Monday, Dec 7th** **10:00am – 12:50pm**