COT 3100 Fall 2020 Syllabus

Instructor: Arup Guha Class Time: Tuesday, Thursday 1:30pm-2:45 pm Class Location: Your House or Wherever, Really Phone Number: 321-663-7749 Instructor's email address: dmarino@cs.ucf.edu Office Hours: Will be posted on the course webpage. Zoom password will be posted inside of Webcourses only. Course Web Page: http://www.cs.ucf.edu/courses/cot3100/fall2020 (includes TA names, office hours, emails)

<u>Note: I do NOT check my Webcourses email. Please email me</u> <u>at dmarino@cs.ucf.edu to contact me.</u>

Course Description: This course provides an introduction to discrete mathematics that is relevant to future computer science courses. Eight major topic areas will be covered: logic, sets, number theory, induction, counting, probability, functions and relations.

Course Goals:

1) Have students learn all of the relevant definitions, symbols, proof techniques and other mathematical tools that are necessary to understand proofs and related material in upper level Computer Science courses.

2) Have students recognize the beauty and creativity in mathematics and to provide a basis for understanding the "method behind the madness" in proofs that seemingly come from nowhere.

3) Have students realize that competency in mathematics is mostly based on hard work and practice, not innate talent.

4) Have students realize that although there are many truly creative steps in mathematical proofs, the general structure of direct proof, proof by cases, and proof by contradiction are NOT creative and can be reliably set up once a student understands the abstract general structure of these proof techniques.

Recommended Textbook: Discrete Mathematics and its Applications 7th Edition by Kenneth H. Rosen (ISBN: 0-07-338309-0, UCF Custom Version ISBN: 0-07-775885-4)

Note: no textbook is necessary and some material may be taken from sources outside of the recommended textbook. Also, any version of Rosen is adequate.

Grading:	Beginning LA Sessions	5%
	Exam 1	15%
	Exam 1 LA Sessions	5%
	Exam 2	15%
	Exam 2 LA Sessions	5%
	Final Exam	25%
	Lab Check Quizzes	10%
	Homework (10)	2% each

The dates for all of the exams and homework are included on the schedule later on this syllabus. The grading scale will be based on the class average, standard deviation and overall difficulty of the assignments and exams. For further details, consult the grading philosophy posted on my web page (http://www.cs.ucf.edu/~dmarino/ucf).

Note: plus/minus grades will be issued, when deemed appropriate.

<u>Exams</u>

The specific format of exams and the allowable aids may vary from exam to exam and will be specified in class the class meeting right before each exam. Exams 1 and 2 will take place during regularly scheduled class times as noted on the schedule in the syllabus and the Final Exam will take at the date and time designated by UCF (https://exams.sdes.ucf.edu/2020/fall). Exams will be timed online assignments.

LA Sessions

UCF has received extra funding from the Gates Foundation in an effort to retain a greater number of students in Computer Science. This funding is paying for two learning assistants for the course. My goal will be to use the LAs to help the students who need help, to increase the number of students who earn a C or higher in the course.

During the first week of class, I'll give a multiple choice pre-test on Webcourses based on high school mathematics topics. For students who do well on this pre-test, I'll award 100% credit for "Beginning LA Sessions." For all other students, I'll assign them to LA meetings on Zoom, starting on week 2. My goal is for these LA sessions to be relatively small and for the LAs to provide students with extra practice problems that the students do. As long as students attend these LA sessions and work on practice problems, full credit will be given for "Beginning LA Sessions." After Exam 1, I'll assign all students who earn lower than 80% to an LA session. Students who earn 80% or higher on the first exam will automatically earn a 100% for these LA Sessions. The same will be repeated for Exam 2. Note that there is a great deal of course support for all students in the course (many TA office hours, SI sessions and instructor office hours), so if you score well on an exam, you'll still have access to plenty of assistance. To be clear, students who are assigned to LA sessions will have more work to complete for the course and more than likely, will take more time than other students, but my hope is that this time investment will increase the pass rate of the class. The reality is that different people must put in different amounts of time and work to achieve the same results, but I want to maximize the people that achieve the result (passing!!!).

Recitation/Lab Check Quizzes

Due to fact that some students are attending recitation live while others are attending virtually and the fact that I can't run a key component of the live recitation (group problem solving), I am going to experiment with a new idea. In addition to these uncertainties, at the time of the writing of the syllabus, there is no TA to physically appear in the labs on campus. Thus, I want to minimize any reliance on in person attendance while not compromising learning.

The model that I will use for recitation is the flipped classroom. Each week, I will record a video for recitation. It will teach a review concept (one that is typically taught in high school for which I've found students often need review), and then solve a few problems that involve either that concept OR the current class topic. Students are expected to watch the video BEFORE coming to recitation (in person or virtually). Then, in person, three new problems will be presented and students will be given time to work on those problems individually. Towards the end of recitation, the TA will work out solutions to these problems.

Credit for this work will be given in a different way. For 11 of the weeks we use this model, there will be an associated Webcourses multiple choice quiz. The quiz will NOT allow retakes. Each of these quizzes will count as 1% of the course grade, with the lowest quiz grade being dropped. Thus, if a student is confident with the material based on the video, there will be no negative consequences to their course grade if they skip the recitation. But, recitation will be a good place for students to get an opportunity to ask individual questions about any of the course material.

Homework Assignments

Homework assignments must be submitted electronically as a .pdf file and must be produced electronically via Word, LaTex or another suitable software program. Homework due dates will only be posted on Webcourses, so please don't ask when an assignment is due. Homework gives students the best opportunity to learn so that students can perform well on exams. Each assignment will contain written problems, will be worth 2% of the course grade, and posted on the class web page. You not only allowed to, but also are welcome to discuss the course with each other and share concepts and techniques where the assignments are concerned. You may not share actual work where the assignments are concerned, or directly collaborate on the assignments in any way. Of course, you can get assistance from course notes and the approved tutors for the course (instructor, TAs, SI tutor, SARC tutor, LAs) for homework assignments.

Regrade Policy

Only I (course instructor) can do regrades. **Regrade requests can only be made on Homework Assignments 1 - 9 and Exams 1 and 2.** All regrade requests must be sent to me via email to dmarino@cs.ucf.edu. The subject of the email must be <u>COT 3100</u> <u>Regrade Request</u>. In your email, please tell me your name, which exam question or homework question you would like regraded, and why you think you deserve a different grade. All requests <u>MUST BE MADE</u> within one week of when the assignment or exam grade is posted. I will consider each request in a timely manner and make a decision, which will then be final. Keep in mind that many times, I can't change a grade because the TA simply followed the grading criteria I provided, so please make sure you consult the grading criteria and posted solutions before making a request.

Cheating Policy

Cheating will not be tolerated. If a student is caught cheating on a quiz or an exam, the student will be given an automatic **F** in the course and a **Z** designation will be submitted to the university. *I have given several Z designations to past students in other courses,* so please don't test me. Exams and homework are to represent the original work of the student. On homework, students may consult notes online, but may NOT try to solicit for someone to answer the same identical question or look for the answer to a similar or identical question online. Students may receive help from all approved tutors for the course: instructor, TAs, SI instructor, SARC tutoring and the LAs and may discuss high level ideas with other students. For exams, students may not have <u>ANY</u> communication with other people or consult websites such as Wolfram Alpha that automatically solve many mathematics problems. If you have to ask me if something is cheating, it probably is. (If you really aren't sure, please ask before you engage in the behavior.)

Make Up Exams

In order to take a make-up exam, you must request one from the instructor. The instructor will grant requests using his own judgment by applying the following general rule: "Make-up exams will only be given if the reason for missing the exam was out of the student's control." For example, being hospitalized unexpectedly is out of a student's control, but oversleeping or going to happy hour is not out of a student's control. *If possible, it is recommended that the instructor be contacted before the exam.*

Late Assignments

No late assignments will be accepted unless previous arrangements are made with the course instructor. Note: Since homework is a relatively small percentage of the course grade, the bar will be very high to grant extensions, since granting a single extension means delaying the posting of solutions for 500 students (in both sections of the course). In the case of an emergency when this is not possible, contact the instructor as soon as it is convenient to do so. The instructor has final say in granting extensions on homework assignments. In general, the same sort of rule will be followed for these extensions as for granting make-up exams as stated above. *TAs are NOT allowed to give extensions for assignments under any circumstances.*

Course Webpage and Webcourses

Both the course web page and Webcourses will be crucial elements of the course. *It's your responsibility to check both of these before each class meeting for any updates that may be posted.* Webcourses will be used for keeping track of grades and making announcements. The course web page will have lecture notes, assignments, solutions, and other helpful links and material. Furthermore, some clarifications may only be given in class videos, so make sure you keep up with announcements in class.

COVID-19 Statement

Please read UCF's required statement about COVID-19 applicable to all syllabi this semester:

https://fctl.ucf.edu/teaching-resources/course-design/syllabus-statements/

I will record live lectures during each of the regularly scheduled class times. It is suggested that students watch the lectures when I give them, but not required. Students are required to watch the lectures within 24 hours of when they are given, to make sure they don't fall behind. If you view lectures in a location that has people outside of your "pod" who are potentially near you (less than 10 feet), please do wear a face mask while viewing.

I will record videos for recitation/lab that are to be watched <u>**BEFORE</u>** you attend recitation either virtually or in person. Along with the course lectures, these lectures will be recorded and available after they are given. The lectures are intended to be viewed live while the videos for recitation are intended to be viewed AFTER they are recorded.</u>

Recitations themselves <u>will not be taped for future viewing, so you must virtually</u> <u>watch them at the scheduled time.</u>

The lab/recitation quizzes will be given in a 3-5 day window via the Quiz tool in Webcourses. This is how credit is logged for recitation. Note that the ONLY Webcourses section that will be used for the class is the lecture section, section 2. The Webcourses for the labs/recitation will not be activated.

All exams will be given in real time (during scheduled class times) as short timed assignments via Webcourses. These dates and times are posted on the syllabus and it is expected for students to take these quizzes and exams at the dates and times stated. These times are **NOT flexible**, like the lecture viewing times.

If you become ill during the semester and are unable to continue doing work in the class, please email me and we can decide together what the most appropriate action would be (make up assignments during the semester, regular withdrawal, medical withdrawal or incomplete). If you are ill but can still work from home, there is no need to let me know, unless you believe you need some special accommodation.

Tentative Class Schedule

Week	Tuesday	Thursday	Recitation	Sunday
Aug 24-30	Intro	Logic	Problems	
Aug 31-Sept 6	Logic	Logic	Problems	Hmk 1 Due
Sept 7-13	Sets	Sets	Exam Review	Hmk 2 Due
Sept 14-20	Sets	Exam #1	Problems	
Sept 21-27	Number Theory	Number Theory	Problems	Hmk 3 Due
Sept 28-Oct 4	Number Theory	Number Theory	Problems	Hmk 4 Due
Oct 5-11	Induction	Induction	Problems	Hmk 5 Due
	Background			
Oct 12-16	Induction	Induction	Exam Review	Hmk 6 Due
Oct 19-23	Induction	Exam #2	Problems	
Oct 26-30	Counting	Counting	Problems	Hmk 7 Due
		Withdrawal		
		Deadline (Fri)		
Nov 2-6	Counting	Counting	Problems	
Nov 9-13	Probability	Probability	Problems	Hmk 8 Due
Nov 16-20	Probability	Relations	Problems	Hmk 9 Due
Nov 23-29	Functions	Thanksgiving	Lab Cancelled	
Nov 30-Dec 4	Functions	Final Exam	Exam Review	Hmk 10 Due
		Review		
Dec 7-13	Final Exam			
	(1pm – 4pm)			
	Dec 8, 2020			

While there is a recommended text, my lectures may not follow the material in the text. For this reason, watching the lectures live or within 24 hours of when I give them is critical. This schedule 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 I will tell you what we will be discussing during the next class period. I will attempt to place notes on the course web site (prior to each day's class) which will be the basis for that day's lecture. Note: The homework due dates listed in blue are only estimated due dates. The actual due dates will be posted on Webcourses. What's on Webcourses supersedes what is listed above, as what is listed above is simply tentative. Unless there is some natural disaster that shuts down campus (or other reason campus is closed), the dates for the exams above are accurate. Note: The lab quizzes are not on this schedule. Usually, there will be a 3-5 day window within which to complete the lab quiz, after students have gone to their recitation for that week.