COT 3100 Sections 1, 2 Spring 2025 Syllabus

Instructor: Arup Guha

Section	Class Times	Class Location
1	TR 3:00 – 4:15 pm	CB2-207
2	TR 1:30 – 2:45 pm	CB2-207

Instructor's email address: dmarino@ucf.edu
Office Hours: https://www.cs.ucf.edu/~dmarino/ucf/OH.html
Course Web Page: http://www.cs.ucf.edu/courses/cot3100/spr2025 (includes TA names, office hours, emails)

Note: I do NOT check my Webcourses email. Please email me at dmarino@ucf.edu to contact me.

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.

Note: No textbook for the course is necessary. The course notes and accompanying files, along with online materials should suffice to learn the course material. Any collegiate level text on Discrete Mathematics that covers the eight topics listed in the course description will be adequate for reference purposes.

Grading:	Pre-Test	0%
	Exam 1	20%
	Exam 2	20%
	Final Exam	25%
	Recitation Attendance	5%
	Study Group Notes (2)	3% each
	Recitation Quizzes (2)	5% each
	Homework (6)	2% each
	Project	2%

The dates for all of the exams and quizzes are included on the schedule later on this syllabus. Homework/Project due dates will be posted on Webcourses. 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.

Pre-Test

A pre-test on Webcourses will be given based on high school mathematics topics. This quiz is to be completed in a single sitting during the first week of class. While it does not contribute to the class grade, the results from it will be used to form study groups in lab/recitation. In order for these groups to be formed well, it's critical that (a) students take the pre-test seriously, and (b) students don't use outside aids to solve the problems. Last semester, the data showed that quite a few students cheated on this assignment, which rendered its purpose useless. I am hoping that by not making it part of the grade, students follow my directions so that groups can be appropriately formed.

Exams

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/2025/spring). Exams will be in person.

Recitation Attendance

Attending class and doing practice problems correlate with success in this course. To that end, to encourage attendance, a portion of the course grade will be based on attending recitation. In recitation, on most weeks, students will work on practice problem in their assigned study groups. (More on this later in the syllabus.) The TA will take attendance when he or she sees fit. **If a student comes to recitation, but doesn't respond when the TA is taking roll, then for grading purposes, the student will be treated as absent.** Since there are many recitations and students have various valid reasons to miss recitation (work, club activity, sick), and it's a headache to administratively "excuse"

absences in a large class, students will simply have to attend a total of 10 times over the semester to receive full credit for this. Thus, each time a student attends he or she receives half a percent credit towards the course, capped at full credit of 5% for the course. (In practice, this means students have 3 or 4 freebies to use for recitation attendance. The recitation that meets on Monday will meet 13 times instead of 14. Regardless, everyone has plenty of freebies. In all honesty, no one should use more than 1 or 2.)

Recitation Quizzes

Two quizzes will be given in recitation based on the recitation practice problems. Each of these quizzes will be worth 5% of the course grade.

Study Group Notes

The pre-test results will be used to create study groups in the recitations. Most weeks, the groups are expected to work on practice problems during recitation. In addition, the groups are required to meet outside of recitation (could be in person or over Zoom) a minimum of 3 times before the second exam and 3 times before the final exam to work together to help all group members understand the material. Each group should work together to generate summary notes for each meeting. These notes will be submitted twice during the semester and each submission is worth 3% of the course grade. More details of what should occur in group meetings will be discussed in class.

Homework Assignments

Homework assignments and the project 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 homework assignment will contain written problems and will be worth 2% of the course grade and posted on the class web page.

Project

Many students have difficulty understanding why a course such as COT 3100 is required of Computer Science majors. To help students see the connection between the course and the major, one project showing the application of math to solving a problem that a Computer Scientist might have to solve will be given. The project will require some mathematics on paper and one or more relatively short computer programs. Programs may be written in Python or C. This project is worth 2% of the course grade.

Community Service Opportunity

If you would like to get automatic full credit for 25 points (out of 125) on the Final Exam), you can do 5 (or more) hours of community service with a registered 501(c)(3) organization **BEFORE April 10, 2025** and turn in a physical copy of the required signed form and activity summary (more details on the course web page) by the **1 pm on April 10, 2025.** The form and requisite write up **must be submitted by hand to me by that date and time.** Note that both sections meet after this time so I won't accept these in class on that day. My preference is that you hand it to me in class on April 8th or earlier so that you don't cut it so close. Every semester, a couple students are just a couple minutes late and I don't count their forms. **Please do the community service early and submit the forms to me way in advance, so that this doesn't happen to you.**

Regrade Policy

Only I (course instructor) can do regrades. **Regrade requests can only be made on Exams 1 and 2.** All regrade requests must be made in person. When doing so, you must bring **the physical exam in question** and show the question(s) you felt were graded incorrectly.

All requests **MUST BE MADE** within one week of when the exam grade is returned for the first time in class. I will consider each request when it is presented to me 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.

Homework WILL not be regraded. Each assignment is only worth 2% of the course grade, making individual points on homework assignments worth very, very little. The amount of time to deal with a regrade on these small, small stakes isn't worth the change in grade that they may amount to.

Note: Fixing a clerical error is not a regrade. Please bring to our attention ALL clerical errors (wrong grade recorded in Webcourses). These will be processed all the way until the end of the course.

Academic Misconduct Policy

You may not use ChatGPT or any significant assistance solving homework or project questions except for assistance from the course notes and UCF staff who are hired for the purpose of assisting students learn material for this course. Course staff are NOT able to assist students in solving quiz and exam questions. For these, all valid aids will be denoted in class before the quiz/exam.

Academic Misconduct 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, quizzes and homework are to represent the original work of the student. On homework, students may consult notes and online sources, 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. **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. **Please request a make up prior to the scheduled exam date.** 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. ***Very few make up requests are honored if they are received after the exam.***

Late Assignments (Homework, Projects)

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 250 students.** In the case of an emergency, 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, so please make sure you come to class, or if you can't, you have a friend relay any important announcements to you.

Tentative Class Schedule

Week	Recitation	Tuesday	Thursday	Sunday
Jan 6	Problems (D = RT)	Intro	Logic	
Jan 13	Problems (Logs)	Logic	Logic	**Hmk #1: Logic**
Jan 21	**Exam #1 Review**	Sets	Sets	**Hmk #2: Sets**
Jan 27	Problems (Rnd Alg)	Sets	**Exam #1**	
Feb 3	Problems (Poly roots)	Number Theory	Number Theory	
Feb 10	**Lab Quiz #1**	Number Theory	Number Theory	**Hmk #3 N.T.**
Feb 17	Problems (Factorization)	Sums/Matrices	Induction	
Feb 24	**Exam #2 Review**	Induction	Induction	**Hmk #4 Ind.**
Mar 3	Problems (AG Series)	Induction	**Exam #2**	
Mar 10	Problems (Counting)	Counting	Counting	
Mar 17	**SPRING**	**BREAK**		
Mar 24	Problems (Counting)	Counting	Counting **Withdrawal Deadline (Fri)**	**Hmk #5 Cnt**
Mar 31	Problems (Probability)	Probability	Probability	
Apr 7	**Lab Quiz #2**	Probability	Probability	**Project**
Apr 14	**Final Exam Review**	Relations	Functions	**Hmk #6 Rel/Func**
Apr 21			**Sec 1 Final 4/24, 1 – 4 pm**	
Apr 28		**Sec 2 Final 4/29, 1 – 4 pm**		

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 post the written class notes from class within a day of when the lecture was given