

Honors COT 3100 Spring 2023 Syllabus

Instructor: Arup Guha

Class Time: Monday, Wednesday 9:00 am-10:15 am

Class Location: HEC-118

Instructor's email address: dmarino@ucf.edu

Office Hours: Will be posted on the course webpage.

Course Web Page: <https://www.cs.ucf.edu/courses/cot3100/spr2023> (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:	Study Group Sessions	5%
	Office Hours Meeting	2%
	Quizzes	8%
	Exam 1	15%
	Exam 2	15%
	Final Exam	25%
	Final Project	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.

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/2023/spring>). Exams will be in person.

Office Hours Meeting

As I've gotten older, my memory has worsened. To that end, I'd like to know everyone's names and a bit about everyone. Thus, for 2% of the course grade, you just have to come to office hours and chat with me, both about the course material, strategies you've used for the course and your background. I'd like for the meeting to occur in between the second and fourth week of class for maximum benefit. (Namely, if I only find out about issues towards the end of the course, they aren't correctable. Also, during week 1, it's hard to get a gauge for what may be difficult for you in the course.)

Study Group Sessions

During the first week of class, I'll give a multiple choice pre-test on Webcourses based on high school mathematics topics. I will use the results from this to form student led study groups. Groups are expected to meet weekly to help each other understand the course material. Groups will be required to submit summaries of their meetings over Webcourses 2 times during the semester. The format for these summaries will be discussed in class. These summaries will be used to assign grades to each group.

Note: This pre-test is the “Financial Aid Assignment” showing activity on Webcourses, but it doesn’t actually contribute to the course grade. Thus, you must do it, but doing poorly on it doesn’t adversely affect your course grade.

Quizzes

Two quizzes will be given in class based on the practice problems posted for the regular section's recitation problems. It is expected that the study groups cover this material on their own time outside of class.

Final Project

I'd like for each student in the course to research a discrete mathematics topic that is beyond the course syllabus and write a paper about it. Alternatively, students can come up with a problem to solve (perhaps a problem inspired by a mid-level AIME level problem) and integrate a computer program into the project, doing some mathematics that gets used in the program to solve a bigger problem. I'll approve each student's topic individually and students will have several weeks to work on their project. For those of you who did I.B. in high school, I expect about half the amount of work expected for an Extended Essay, but on a more focused topic/problem.

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.

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 hours of community service with a registered 501(c)(3) organization **BEFORE April 19, 2023**, and turn in the required signed form and activity summary (more details on the course web page) by the **9:00 am on April 19, 2023**. Note, you will only get full credit if I receive the signed form and write up by 9:00 am on that day. If I receive it at 9:10 am on April 19th, then you'll have to take the last portion of the Final Exam to earn points. In past semesters I've rejected forms either because they are late or because the organization in question wasn't a 501(c)(3) organization. **Please do the community service early and submit the forms to me way in advance, so that if you made an error, I can catch it and you have time to fix it.**

Regrade Policy

Only I (course instructor) can do regrades. **Regrade requests can only be made on Exams and Quizzes.** All regrade requests must be done in person. Please bring your exam up to me in class or office hours and show me the question you believe is graded incorrectly. I will re-evaluate the grading and make a final decision at that point. **You have one week after I return exams in class to ask for a regrade.**

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 my attention ALL clerical errors (wrong grade recorded in Webcourses). These will be processed all the way until the end of the course.

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 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. 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 **ANY** 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.

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 to attend class. If you can not make it, please make sure you have a friend pass along all relevant announcements made.

Tentative Class Schedule

Week	Monday	Wednesday	Sunday
Jan 9 – 13	Intro	Logic	
Jan 17 – 20	MLK Day – No Class	Logic	Hmk 1 Due
Jan 23 – 27	Logic	Sets	Hmk 2 Due
Jan 30 – Feb 3	Sets	Sets	
Feb 6 – 10	Exam #1	Number Theory	Hmk 3 Due
Feb 13 – 17	Number Theory	Number Theory	Hmk 4 Due
Feb 20 – 24	Induction Background	Induction	Hmk 5 Due
Feb 27 – Mar 3	Induction (Quiz 1)	Induction	Hmk 6 Due
Mar 6 – 9	Induction	Exam #2	
Mar 13 – 17	SPRING	BREAK	NO CLASS
Mar 20 – 24	Counting	Counting Withdrawal Deadline (Fri)	
Mar 27 – 31	Counting	Counting	Hmk 7 Due
Apr 3 – 7	Probability	Probability	Hmk 8 Due
Apr 10 – 14	Probability	Probability (Quiz 2)	Hmk 9 Due
Apr 17 – 21	Relations	Functions	Hmk 10 Due
Apr 24 – 28	Final Exam Review	Final Exam (7 am – 10 am) Apr 26, 2023	

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. **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.**