

Applications of Discrete Structures

COT 3100 | Sections: 7232, 723D, 77B7 | Class Numbers: 10765, 10766, 10767

Class Periods: MWF 2nd [09:30 – 10:45 AM EST]

Location: TUR L007

Academic Term: Summer 2022

Instructor:

Pete Dobbins

pjd@cise.ufl.edu

352.294.6685

Virtual Office Hours [VOH]: MWF 11 AM – 12 PM EST

- All office hours will be held virtually via Zoom.
- Here is Pete's Zoom room: <https://ufl.zoom.us/j/4755418272>.

Outside of VOH The **best way** to contact me is through our **MS Teams** chat. Everyone registered in our course will be added to the MS Teams chat after the drop/add period has ended. An announcement will be made in Canvas when Teams is available. From that point forward, announcements will be made in Teams. Please let me know if you have any questions.

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Teams and refer to the Weekly VOH schedule in Canvas for office hours and Zoom information.

- Christopher
- Eric
- Vanessa
- Yuchen

Course Description

Covers the mathematics of discrete events; i.e., events that involve distinct elements, finite structures of distinct elements or finite sampled versions of continuous phenomena (such as movement). (M) 3 credit hours

Course Pre-Requisites / Co-Requisites

Prerequisite: MAC 2233 or MAC 2311 or MAC 3472

Corequisite: COP 3504 or COP 3503

Attributes: General Education - Mathematics

Course Objectives

The purpose of this course is to introduce students to the techniques required in order to think mathematically about how a computer operates. Included within the topics of discussion will be: propositional logic, algorithms, time complexity, mathematical reasoning, relations, and trees. Weekly discussion sessions, homework exercises, and problem solving will enable you to practice and learn the techniques discussed.

Rote memorization of terminology and definitions is strongly recommended; if you do not know the terminology, symbols, theorems, and so on, when asked to solve a problem you are not likely implement a valid solution. Due to the nature and complexity of this field of study, the course will be time consuming and requires serious dedication on the part of each student. Be careful not to fall behind, success in this course requires consistent effort and practice.

Materials and Supply Fees

There are no materials or supply fees for this course beyond the textbook and its companion Connect software. See the *Required Textbook and Software* section below for purchasing details.

Professional Component (ABET):

See the table provided in the *Relation to Program Outcomes* section that follows.

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	High
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	Medium
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	
4. An ability to communicate effectively with a range of audiences	
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	
6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	Medium
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

- [McGraw-Hill Connect](#)
- [Discrete Mathematics and Its Applications](#)
- [Kenneth Rosen](#)
- [McGraw-Hill Higher Education](#)
- [2018](#)
- [8th Edition](#)

The textbook comes with Connect. Purchasing through the steps provided in [MGH Connect.pdf](#) [see the link in Canvas → Modules/General Course Info/MGH_Connect.pdf] will link directly to the Canvas plugin.

Course Schedule

Here is a general schedule for the semester. Please refer to the Canvas *Announcements* and *Modules* for final details about each topic, exact dates, and the specific schedule we implement this semester. Note, under Modules, individual lectures are listed using the format: **year / month / day | L##: General Topic**.

Dates	Week	Topics	Chapters	M	T	W	R	F
2022 / 05 / 08 – 05 / 14	1	Logic, Predicate Calculus	1	L01 ⁰	–	L02	–	L03
2022 / 05 / 15 – 05 / 21	2	Inference, Proofs	1	L04	D01	L05	–	L06
2022 / 05 / 22 – 05 / 28	3	Proofs, Sets; Exam 1	1, 2	L07	D02	L08	–	L09 ¹
2022 / 05 / 29 – 06 / 04	4	Functions, Sequences, Summations	2	L10 ²	D03	L11	–	L12
2022 / 06 / 05 – 06 / 11	5	Algorithms	3	L13	D04	L14	–	L15

2022 / 06 / 12 – 06 / 18	6	Complexity	3	L16	D05	L17 ¹	–	L18
2022 / 06 / 19 – 06 / 25	–	Summer Break	–	–	–	–	–	–
2022 / 06 / 26 – 07 / 02	7	Number Theory	4	L19	D06	L20	–	L21
2022 / 07 / 03 – 07 / 09	8	Induction, Recursion	5	L22 ²	D07	L23	–	L24
2022 / 07 / 10 – 07 / 16	9	Counting	6	L25	D08	L26	–	L27 ¹
2022 / 07 / 17 – 07 / 23	10	Probability	7	L28	D09	L29	–	L30
2022 / 07 / 24 – 07 / 30	11	Graphs	10	L31	D10	L32	–	L33
2022 / 07 / 31 – 08 / 06	12	Review	–	L33	D11	L35 ¹	–	L36 ³

Table 1: Semester Schedule // ⁰Drop/Add Freebie [1] // ¹Exam [4] // ²Holiday [2] // ³Make Up [1]

Attendance Policy, Class Expectations, and Make-Up Policy

GENERAL

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Additional policies can be found here: <http://www.cise.ufl.edu/~pjd/admin/policies/course.html>. You are expected **know and follow** all these policies. In order to be successful in this course, you should attend and participate in our live lecture. There is no replacement to the experience of seeing the material presented during lecture.

LECTURE

This semester, we will implement a hybrid of the *flipped* classroom and include collaborative learning to enhance your comprehension of the course material. Our live lectures will focus on solving problems. First, I will review content and present problem solutions. Second, we will solve problems together, as a group. Next, you are allowed to solve Homework exercises with the members of your discussion session. Finally, there will be interactive online exercises for you to solve individually. In order to facilitate much of our live lecture time being focused on group problem solving, videos introducing definitions and terminology will be posted through Canvas. It is expected that you watch these videos in preparation for our live lectures.

Live lectures will be *presented synchronously using* two modalities, **In-Person** in TUR L007 and **Virtually** through Zoom, **MWF 2nd period** [09:30 – 10:45 AM EST]. Select the *Zoom Conferences* menu option in Canvas to join the synchronous virtual modality.

Here are course specific points of significance for our lecture process this semester:

- Lecture **attendance will be taken**. See the *Participation* section below for details.
- You are responsible for all material covered during lecture.
- Lectures **will be recorded** and posted in Canvas under Modules. See the disclaimers and notice that follow.

Disclaimer #1: many Zoom sessions are being held campus-wide to deliver courses and the demand for recorded materials is high. It is possible there will be delays while completing the recording and posting (distribution) process. *I will post live lecture recordings as soon possible* [under the corresponding Canvas Module], however if you want to ensure that you see the lecture as soon you are able, you should participate in the In-Person lecture.

Disclaimer #2: the Zoom platform records these sessions, and I cannot guarantee they will not experience errors in the recording process. I have not observed this to be a significant problem. However, you should always be aware that attending the live lecture session is always the best way to ensure you are able to view the complete lecture content.

Notice: Our lectures will be audio-visually recorded for students in the course to reference after the live recorded session. Students who choose to participate In-Person or Virtually with their camera engaged or utilize a profile image are agreeing to have themselves, their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who participate orally and un-mute virtually during class are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated. A textual “chat” feature is also available during lecture. “Chats” sent through the public channel may be recorded. Due to screen sharing of your instructor’s desktop, even chats sent privately might be recorded. If you do not wish for your message to be recorded, you must send it through other means, such as private Teams chat or email and only to course staff. Please note, since lecture is a public setting, private messages may or may not always be answerable during the live lecture. Office hours are provided throughout the week to accommodate any private discussions that cannot be handled during a lecture session. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited

MAKE-UP/LATE WORK

Makeups or extensions for graded class activities are provided given appropriate documentation is presented in a timely fashion. Excused absences must be consistent with University policies in the undergraduate catalog (<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>) and meet University requirements regarding excused absences. There are very few events which would impede your participation in a graded activity warranting an exception, that you would not be aware of well before [at least a few hours] the start of the activity. The Dean of Students Office (www.dso.ufl.edu) provides rules, guidance, and approval for excuse documentation. Once an excuse has been approved by DSO, appropriate documentation will be provided to your instructors. Contacting me after the graded activity may result in the exception not meeting course requirements and a makeup option no longer being available.

Here are the instructions and submission form for initiating Instructor Notification:

<https://care.dso.ufl.edu/instructor-notifications/>

All excused exams will be made up at the same time, on the same **cumulative Make Up** exam, for an 80-minute timeframe, on Friday, August 5, 2022, during the final lecture period of the semester [09:25 AM to 10:45 AM EST], and in our lecture room TUR L007.

There is not a structured mechanism for makeups or extensions on participation activities and homework. Instead, only a portion of the participation activities and homework must be completed to earn full credit. Refer to the *Participation* and *Homework* sections that follow for the breakdown of each category.

Evaluation of Grades

Activity	Comment	Day	Date	Final Grade Percentage
Exam 1		Friday	2022 / 05 / 27	10%
Exam 2		Wednesday	2022 / 06 / 15	15%
Exam 3		Friday	2022 / 07 / 15	20%
Exam 4		Wednesday	2022 / 08 / 03	20%
Homework	2 drops [lowest scores]	Various		20%
Participation	31 out of 52 activities	Various		15%
Extra Credit	See Extra Credit section	Various		1.5%
Final Total [Score]		→		101.5%

Table 2: Grade Distribution and Activity Dates

Exams

There will be four exams. **Exam 1** will be **10%**, **Exam 2** will be **15%**, **Exam 3** will be **20%**, and **Exam 4** will be **20%** of your final grade. Exams will be:

- Held **In-Person**, for 80 minutes during lecture 2nd [09:25 – 10:45 AM EST].

- Exam dates are provided in Table 1 and Table 2.

While completing exams, you are allowed these resources:

- The exam [provided to you].
- Scratch paper [provided to you].
- A 4-function calculator [not a scientific/graphing calculator, not a mobile device].
- A reference sheet of your construction including:
 - A single sheet of 8.5 by 11 (or smaller) paper.
 - References permitted on both sides of the sheet of paper.
 - only your own handwritten notes [not printed].

Homework [HW]

Homework will be **20%** of your final grade. They will be assigned and completed using the Connect software system. Homework will be more challenging than the Reading Exercises (see below). It is recommended that you complete the Reading Exercises before working on the associated Homework. You are allowed to discuss the homework with your classmates; however, every student must complete their own homework activity in order to receive credit.

Participation

Providing credit for participation in a course our size can be difficult. However, by using Zoom and an interactive textbook, we can efficiently incorporate a dynamic learning experience... the power of computer science technology!

If you attend lecture and discussion sessions In-Person, you will still login to the Zoom session so that your participation (attendance) is recorded. You can join Zoom sessions using a laptop, tablet, or other mobile device. In all cases, you will join having logged into your [Gatorlink account](#).

To receive credit for an attendance-based participation activity (lecture and discussion), you are required to:

- be logged into your Gatorlink account,
- join the corresponding Zoom session,
- and be present in the Zoom session for a minimum of **35 minutes**.

The first day of the semester, L01, is a participation *freebie*. Everyone will automatically receive attendance credit for L01. Referring to Table 1, we have:

- 36 lectures [including L01],
 - 11 discussions [starting Week #2],
 - 4 exams [dates in Table 2],
 - 2 holidays,
 - and 1 make up.
- Note, there are 29 non-exam lectures, $36 - 4 \text{ Exams} - 2 \text{ Holidays} - 1 \text{ Make Up} = 29$

In addition, we will also have 12 Reading Exercises (RE), completed through the interactive textbook.

In total, there are $(36 - 4 - 2 - 1) + 11 + 12 = 29 + 11 + 12 = \mathbf{52}$ participation activities. To earn the full **15%**, you must complete **31 of the 52** activities [note, you may miss 21 or greater than 40% of the participation activities without penalty].

You can calculate your total participation points earned with this formula:

$$\text{participation} = \frac{(\text{lectures attended} + \text{discussions attended} + \text{RE scores})}{31} * 15$$

Discussion Sessions

Discussions (sometimes referred to as labs) **begin** during Week #2 on Tuesday, **May 17, 2022**. Discussions will be held synchronously in your assigned discussion room [see table below] and through Zoom [see Canvas → [Zoom Conferences](#) for your Zoom room], meeting on the 11 Tuesdays of the semester after Week #1 (there is no discussion Week #1). During discussions, we will review course material, solve problems together, and you will work with classmates to construct solutions to problems. Discussion attendance is incorporated into the participation evaluation [see the *Participation* section above]. Following UF policy and to ensure receiving credit for discussion attendance, you must attend your **UF registered** discussion session. Discussion sessions will **NOT** be audio-visually recorded. The class numbers, meeting times, and locations are provided in this table.

Class Number	Section	Period	Time	Location	Leaders
10765	7232	7	05:00 – 06:15 PM EST	LAR 0310	TBD
10766	723D	5	02:00 – 03:15 PM EST	LIT 0113	TBD
10767	77B7	2	09:30 – 10:45 AM EST	LAR 0310	TBD

Reading Exercises [RE]

We will use McGraw Hill's Connect system to read through the textbook. After completing the reading for each section, there will be exercises directly associated with the material you are reading. The Connect system will assist you as you complete the exercises. These exercises are more introductory than the Homework and it is recommended that you complete them before working on Homework activities. Reading Exercises will be completed individually.

Extra Credit

Students often wonder if there are extra credit opportunities available and we have a few natural opportunities through our participation structure. You can earn 0.25 points to your final total [score] in our course by completing each of these:

- Attending at least 24 [>80%] of the 29 non-exam lectures.
- Attending all 29 non-exam lectures [100% → 0.25 for >80% + 0.25 for 100% → a 0.50 increase!]
- Attending at least 9 [>80%] of the 11 discussions.
- Attending all 11 discussions [100% → 0.25 for >80% + 0.25 for 100% → a 0.50 increase!]
- Earning at least a score of 10 [>80%] out of 12 on Reading Exercises.
- Earning a 12/12 on Reading Exercises [100% → 0.25 for >80% + 0.25 for 100% → a 0.50 increase!]

Since there are 6 ways to earn extra credit at 0.25 points per way, you can add a total of 1.5 points to your final total in our course.

Grading Policy

The range used to calculate your final letter grade in our course will be no harsher than this grading scale provided in the following table. Your final point total will be calculated using the percentages given in the *Evaluation of Grades* section. The percent you earn on each activity will be multiplied by the grade points associated with that activity.

Grade Points	Letter Grade	Highest	Lowest
4.00	A	100+	92.00
3.67	A–	91.99	89.00
3.33	B+	88.99	86.00
3.00	B	85.99	82.00
2.67	B–	81.99	79.00
2.33	C+	78.99	76.00
2.00	C	75.99	72.00
1.67	C–	71.99	69.00

1.33	D+	68.99	66.00
1.00	D	65.99	62.00
0.67	D-	61.99	59.00
0.00	E	58.99	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Re-Grade Requests

All grading/re-grading issues **must** be resolved within **1 week** of the graded work being returned. You must return exams/projects/quizzes to the person grading the activity in question, along with a **printed (not handwritten) attachment** stating the reasons for the re-grade. Do not write anything on the exam itself or detach (un-staple) the pages from each other. If you do so, your exam/project/quiz will not be re-graded. Note, when requesting a re-grade, the whole exam/project/quiz is subject to the re-grade, not just the portion you specify. We will be happy to discuss the solution and answer any questions, however no change will be made after the allotted week has passed.

Disclaimer

This document is subject to change at the discretion of the instructor, based on unforeseen circumstances (such as pandemics, hurricanes, sub-freezing temperatures... this is Florida after all, rifts in the fabric of time, and so on) occurring during the semester. Any such change would be introduced in order to better accommodate *you* due to the circumstances being experienced.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request accommodations should connect with the Disability Resource Center <https://disability.ufl.edu/students/get-started/> (352.392.8565, <https://disability.ufl.edu/>). Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester, delaying may affect the ability to schedule the accommodation. All exams, quizzes, and so on administered through the DRC office must follow the course exam structure, being completed on the same date and time as the course exam.

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/>.

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.

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://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

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