Discrete Structures

COSC 290
Course and Labs

Instructor Info

Forrest Davis (he/him)

Office Hours: 10:30AM-1:30PM

Office Hours: 331 Bernstein

fdavis@colgate.edu

Course Info

Class: T, R | Lab A: W | Lab B: W

2:45-4:00PM | 12:45-2:35PM | 2:45-4:35PM

212 Bernstein | 333 Bernstein

Overview

This course introduces discrete computational structures, methods, and concepts utilized throughout computer science. Topics include elementary knowledge of probability, linear algebra, graph theory, and number theory, as well as proof techniques such as induction and contradiction.

Material

Required Text: Discrete Mathematics and Its Applications (8th Edition) by Kenneth H. Rosen. You can find a pdf copy here.

Course Website: You can find the course website where course materials, codelets, proof assignments, labs, and the schedule will be posted at `https://forrestdavis.github.io/cosc290/`.

Coursework

Codelets

Codelets are smaller programming assignments focused on a central concept or task from the lecture. There will be approximately 7 codelets, each graded on a satisfactory / unsatisfactory basis, where satisfactory demonstrates you meet the expectations of the codelet (passing all relevant tests and a clear demonstration of topic mastery). *Note: you might be requested to orally explain your answers to me to validate your assessment.*

Proofs

Proofs are more substantive assignments that focus on a central topic from lecture. There will be approximately 4 proofs. *Note: you might be requested to orally explain your answers to me to validate your assessment.*

Labs

Lab assignments apply and extend the concepts from class. There will be around 10 lab assignments throughout the semester. They are graded on a satisfactory / unsatisfactory basis, where satisfactory demonstrates you meet the expectations of the labs (passing all relevant tests and demonstrating deep engagement with the material). Note: *you might be requested to orally explain your answers to me to validate your assessment.*

Exams

The exams are designed to test your understanding of the core concepts covered in class, and your ability to apply them in different contexts. The scope of each exam is indicated on the course schedule. No discussion of exam questions or possible solutions is permitted from the time the exam is first administered until exams have been returned.

- Midterm Exam 1: February 26 (in class)
- Midterm Exam 2: April 9 (in class)
- Final Exam: May 4 (12:00-2:00PM)

Please let me know at least one week in advance if you will be unable to take one of the exams on the scheduled date. Note: In order to pass the course, you must pass the exams.

Grading Scheme

Your course grade is based on your codelets, proofs, exams, and attendance. Your lab grade is based on your lab assignments and attendance. The table below defines specific criteria for mapping from satisfactory / unsatisfactory assignments and attendance to the letter grade used in your final grade calculation.

Grade	Codelets (# S)	Labs (# S)	Attendance
A	7	10	0 unexcused absences
B	5-6	8-9	1-2 unexcused absences
C	4	6-7	3-4 unexcused absences
D	2-3	4-5	5-6 unexcused absences
F	0-1	<4	>6 unexcused absences

Grading is on an absolute scale (i.e., no curve). Letter grades will be assigned as shown below. However, I reserve the right to make adjustments; any such adjustments will only raise your grade, never lower it. A grade of A+ is awarded when the student demonstrates truly exceptional performance and is not simply determined by having a high final grade.

F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
< 60	60 - 62	63 - 66	67 - 69	70 - 72	73 - 76	77 - 79	80 -82	83 - 86	87 - 89	90 - 92	$\geq$ 93	*

Course Grade Breakdown

10% Attendance

15% Codelets

15% Proofs

30% Midterm Exams*

30% Final Exam*

*You need earn $\geq$ 60% on the midterm exams (average) and on the final exam to pass the course

Lab Grade Breakdown

40% Attendance

60% Labs

Policies

Attendance and Engagement

Attendance to class is expected and contributes to your final grade. However, I do not expect you to attend if you are feeling unwell. Additionally, if you have athletics, scheduled commitments, or other issues please let me know. If you miss a class, you can make up the credit by performing a check-in email. For a check-in, consult with a classmate and/or review the materials, and within 48 hours of the class send me an email containing:

1. a brief summary (2-4 sentences) of what was covered
2. any thoughts/questions you have

Check-ins are not a substitute for attending class regularly. While in the class, you are expected to engage with the material and the other students in the course. You should aim to be a good participant: raising your hand, respecting others, actively listening, and making sure to leave space for others to speak. There are no bad questions, and I would always rather you contribute than avoid doing so.

Deadlines

I will be reasonably flexible on deadlines if I have advance notice. If you need some extra time due to illness, your workload in other classes, and/or personal matters, please let me know. As long as you have made a good faith effort to complete learning activities by the original deadline, I am willing to offer a reasonable extension. I will be less willing to grant an extension if you wait to start a assignment until the day before it is due (when you've had a week to work on it), repeatedly ask for extensions, etc.

Any assignment that is turned in late without prior approval will be marked as unsatisfactory or receive a 0%.

Academic Honesty & Collaboration

You are expected to abide by Colgate's academic honor code. The overarching policy of this course is that the work you turn in should represent your own thinking. You should be accountable to its content (e.g., be able to explain what your code does or how your proof works). I may ask to meet with you to discuss your work. Your grade may change based on the conversation.

Collaborating with peers in the class

You may discuss course concepts, generic aspects of python, and work through the logic of something you don't understand with your peers. However, you should not share code (including psuedo code). Your submitted work should be your own. Here are some concrete rules that exemplify this (but are not intended to be comprehensive):

Do NOT:

- Ask a peer (past or present) to debug your code.
- Ask a peer (past or present) for a proof needed for an assignment.

You CAN:

- Ask clarification questions about the fundamentals of programming (e.g., "How do I create a class in Python?")
- Ask for conceptual clarifications (e.g., "What is the difference between proof by contradiction and proof by induction?")
- Try to work through the logic of something you don't understand (e.g., "How are odd numbers defined?")

Using Generative AI tools

Generative AI systems, if used correctly, can serve as powerful tools. In this course, you can use generative AI systems to learn about concepts iteratively through a interaction, to help you debug parts of your code, to help direct you to resources. However, you cannot ask these systems to directly give you answers to proof assignments or write all the code for you for an assignment. Ultimately, I want you to become competent computer scientists who can reason about core structures and mathematical concepts in computer science without assistance. When you include work from some generative AI system in your assignments you must include attribution and a brief – no more than 15 words – description of what you wanted it to do. Note, attribution is not sufficient to avoid claims of cheating.

Remember: Policies around the use of Generative AI tools, like any other course policies, vary across different courses both within and outside the department.

Anonymous Feedback

Your feedback on this course is important for helping me improve the learning environment. You can provide anonymous feedback at any point in the semester via this form. *Note, you must be accessing the form from a Colgate account, but your email is not recorded.*

Getting Help

A key to your success at Colgate is figuring out what resources are available and using them to help you achieve your goals. There are several options for getting help with this course:

1. Drop in during my office hours (noted at the top of the syllabus) or if no office hours times work, arrange an appointment with me – just send me an email with a few times you are available, and we will find a time that works well for both of us. If my door is open to my office (322 Bernstein), you may (occasionally) knock and ask a quick question.
2. Form a study group with other students in the class and work together on a regular basis (note the Academic Honesty & Collaboration policy above).

I also encourage you to reach out to many great resources at Colgate that can assist you with academic, personal, or other needs, including:

- Administrative Deans (https://www.colgate.edu/about/offices-centers-institutes/dean-college/administrative-advising) help you understand policies and procedures, navigate personal challenges, work with faculty, and engage with parents.
- Counseling Center (https://colgate.edu/counseling) staff are trained to help students manage a wide array of emotions. The counseling center meets with over half the student body for clinical services at some point during their four years at Colgate. You can arrange an appointment online or by phone (315-228-7385). For emergencies, a counselor is available 24/7 by calling campus safety at 315-228-7333 and asking for the counselor on call.
- Haven (https://colgate.edu/haven) is a sexual violence response center that provides confidential care, support, advocacy, and trauma-informed clinical services for survivors of sexual assault, intimate partner violence, child/family abuse, stalking, and/or harassment. You can call (315-228-7385) or visit during business hours. You can also contact the Help Restore Hope Center (855-966-9723).
- Student Health Services (https://colgate.edu/offices-and-services/studenthealthservice) provides accessible, convenient, cost-effective, non-judgmental, and confidential care for all students.
- Information Technology Services (https://colgate.edu/its) help desk consultants assist all students with problems concerning email, Portal, Moodle, or your personal laptop. Contact me if problems with your personal computer are affecting your ability to get your work done.
- Chaplains (https://colgate.edu/campus-life/religious-life/officeofthechaplains) provide the community with a dynamic, friendly, and supportive place.