

# Syllabus

## CS 1800 (section 1), Discrete Structures

### Spring 2024

#### Course Information

**Time and Place:** MWF, 1:00-1:50, Lang 211

**Instructor:** Dr. Ben Schafer

**Email:** ben.schafer@uni.edu

**Office Location:** Lang 221

#### Student Hours:

My regularly scheduled student hours this semester will be:

- MWF, 11-12 AM – Drop in or by reservation.
- MWF, 2-3 PM – Drop in or by reservation.
- MW, 3:00-4:00 – Advanced reservations only.

If you would like to meet with me face-to-face you can just stop by my office during those times. If you would like to meet with me over zoom you should first reserve an appointment using my online calendar at least one day in advance.

- <https://bit.ly/SchaferScheduler>

Then at the appropriate time, you can log on to the following Zoom room:

- <https://uni.zoom.us/j/3192732187> [Using the 3-letter name for our campus as the password]

If those times don't work for you, please send me an email and propose a specific alternative. I want to meet with you at a time/place that works for both of us, and I am very willing to work things out.

**Credit Hours:** Three (3). This course meets the Credit Hour Expectations outlined in the Course Catalog. Students should expect to work approximately 2 hours per week outside of class for every course credit hour.

#### Class Websites:

- <https://www.cs.uni.edu/~schafer/1800/> (most lesson materials)
- Blackboard (Grades and some lesson materials)

#### Textbook

You will be required to purchase online access to the textbook from zyBooks. Separate instructions are posted on the class website on how to register and purchase this textbook.

#### Computer Use

All the learning materials for this course are available from any computer with a web browser and internet access. You will need access to a computer with Internet access while off-campus and when in the classroom. If you do not have access to a device for daily use, please reach out to me and we will discuss how you might check one out from the university.

#### Prerequisite or Co-requisite

One of the introductory programming courses (CS 1510) and a mathematical background sufficient to take college pre-calculus. Talk to me if you are concerned about these requirements.

## Course Description

Discrete Structures is a core course in Computer Science curriculum. It is a required course for all CS majors and the CS minor. The course focuses on key mathematical concepts used in programming and the discipline of CS in general. Topics include an introduction to logical forms, arguments, predicates, and quantified statements; methods of proof; elementary number theory; counting; sequences; sets; functions; relations; graphs; and Boolean algebra in the context of computer science.

## Course Learning Outcomes

By the end of this semester students taking this course should be able to:

- Apply principles of mathematical logic to software development
- Use proof techniques to derive equalities, inequalities and summations commonly used in computer science
- Use counting techniques to compute the number of elements in a set and to derive probabilities of events
- Become familiar with mathematical foundations of basic data structures such as sets and trees
- Perform basic operations on data structures
- Write functions in recursive form
- Derive the asymptotic classes of functions

## Class Structure

Depending on your experiences at UNI, my classroom may look and feel very different from what you are used to. I don't "lecture" in the traditional sense. I most often use the techniques of a "flipped" classroom, combined with peer instruction.

The key difference is that I expect that you will come to class ready to engage with a specific topic. My classroom should never be the first time you are hearing about most topics. For each topic I will ask that you come to class having completed the course readings and solved the interactive problems in your online textbook. Then, we will spend class time taking clarifying questions, interacting with your peers, and practicing with the types of problems that will appear on the competency demos (exams).

## How Student Performance Will Be Evaluated

### Course Grading

I use a grading system that is a combination of "standards-based grading" and "grading for equity" (<https://gradingforequity.org/>). The main ideas behind this are:

- Your job, as a student, is to show me (sometimes multiple times) that you can meet the course outcomes.
- My job, as the teacher, should be to make sure that you are given plenty of opportunities to learn and practice what you need to demonstrate the course outcomes.
- Your final grade in the class should indicate your ability to meet the course outcomes and, for the most part, nothing else.

The first key change you will notice in my classroom is how grades are earned/assigned. Educational theory separates out the concepts of “formative assessment” – the assessment of what you know while you are learning a topic – from “summative assessment” – the assessment of what you know at the end of your study of a topic. My belief is that you should receive formative assessment grades – feedback on how well you are doing while learning a topic – but that these should not be used in assigning your final grade. The only thing used in your final grade should be summative assessment.

In many of the classes you have taken you are probably graded on many things – homework, attendance, reading quizzes, tests, etc. In my style of grading, I only grade you on what I refer to as “competency demos.” These are the final chapter “tests” from most classes. Everything else is not part of your final grade.

That doesn’t mean that I don’t think that attendance is important. It doesn’t mean I don’t think homework is important. I do!!! But it means that I shouldn’t be grading you on those things.

The second key change you will notice in my classroom is that I really do WANT you to succeed in the course. That means that if you attempt to show me competence at a topic and can’t, I want to give you the opportunity to attempt to relearn what you missed the first time and show me that you can master the skill(s). That means giving you a second (and occasionally a third) opportunity to show me that you have learned the necessary material. In most cases in this course, if you can't show competency the first time, you will be able to re-study and try again. How this works will be explained as the course goes on.

The final change you will notice in my classroom is that I don’t use the idea of 90/80/70/60 when assigning grades. I think that this puts the emphasis in the wrong place. Students end up hyper focused on a number rather than whether they are learning.

Each of the competency demos in this course will be broken down into one or more learning outcomes. Several questions on the CD will assess your competency with that outcome. In the end, I will assign you a score from 1-4 with the following meaning:

Score	Meaning
1	UNASSESSABLE - You show very little understanding of the learning outcome
2	NEEDS WORK - You have made significant progress towards demonstrating competency but there are limited items that remain unsatisfied.
3	SATISFACTORY - You have "met" the standards of the learning outcome.
4	EXCELLENT - You have "exceeded" the standards of the activity. [You have met the standards of competency and shown considerable understanding/knowledge of the material.]

While it might be tempting to view these categories as similar to GPA categories (which is also a 4-point scale) that is not the way they are used or interpreted.

Final course grades will be determined using the following evaluation criteria.

Grade Earned	Average Score	Additional Conditions
A	> 3.5	All scores 3-4
A-	> 3.5	All scores 2-4
B	> 3.0	All scores 2-4
B-	> 3.0	All scores 1-4
C	> 2.5	All scores 2-4
C- *	> 2.5	All scores 1-4
D *	> 2.0	All scores 2-4
D- *	> 2.0	
F *	2.0 or less	

#### NOTES:

- Because I allow – and encourage – retakes, most students do just fine in this course. It is VERY rare that a student who has been an active participant in the class is unable to earn at least a C for a final grade.
- If I feel there are specific and individual circumstances where "mathematically" you earned a grade slightly lower than I feel your overall competence has demonstrated than I reserve the right to raise your grade one level from that published above.

Please note, to be responsive to your needs I reserve the right to modify the structure of this course as we are in progress. If there is significant deviation from the policies described above, this new policy will be clearly discussed with you and in a timeframe that gives you a time to plan accordingly.

#### Final Thoughts

If you are having trouble with a topic in the class, please reach out to me **early**. Do not wait until the situation is out of control. I am very willing to help. However, I must know you need and want that help.

#### Additional Policies and Statements

##### Scholastic Conduct

You are responsible for being familiar with the University's Academic Ethics Policies:

<https://www.uni.edu/policies/301>

Copying from other students is expressly forbidden. Doing so on CDs will be penalized every time it is discovered. The penalty can vary from zero credit for the copied items (first offense) up to a failing grade for the course. If an assignment makes you realize you do not understand the material, ask a fellow student a question designed to improve your understanding, *not* one designed to get the assignment done. Your final submission for assignments should be **individual, original** work unless otherwise specified. Any substantive contribution to your solution by another person or taken from a publication should be properly acknowledged in writing. Failure to do so is plagiarism and will necessitate disciplinary action. In addition to the activities we can all agree are cheating (plagiarism,

bringing notes to a closed book exam, etc.), assisting or collaborating on cheating is cheating. Cheating can result in failing the course and/or more severe disciplinary actions. Remember: Discussing assignments is fine and even encouraged. Copying code or answers is not.

### **Accessibility**

The University of Northern Iowa (UNI) complies with the Americans with Disabilities Act Amendments Act of 2008 (ADAAA), Section 504 of the Rehabilitation Act of 1973, the Fair Housing Act, and other applicable federal and state laws and regulations that prohibit discrimination on the basis of disability. Students with disabilities experiencing a barrier to access should connect with Student Accessibility Services (SAS) to request accommodations. For more information about the accommodation process, please contact SAS at (319) 273-2677 Relay 711, [accessibilityservices@uni.edu](mailto:accessibilityservices@uni.edu), or GIL 118. Additional information is also available at [sas.uni.edu](http://sas.uni.edu).

### **The Learning Center**

The Learning Center @ Rod Library provides free tutoring for a variety of different areas (i.e. writing, math, science, business, Spanish, college reading and learning strategies). The Learning Center @ Rod Library is open for walk-in assistance Monday-Thursday 10am-10pm and is free of charge for all UNI students. If you are unavailable during normal tutoring hours, online tutoring is also available through Smarthinking. You will need your CATID and passphrase to gain access. To access the Smarthinking platform go to <https://tlc.uni.edu/online>. For more information, go to <https://tlc.uni.edu>, email [TheLearningCenter@uni.edu](mailto:TheLearningCenter@uni.edu), call 319-273-6023, or visit the TLC desk located on the main floor of Rod Library.

### **Free Speech**

The University of Northern Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We encourage the free and responsible exchange of diverse ideas on our campus. The University is committed to open inquiry and the spirited and thoughtful debate of such ideas.

### **Office of Compliance and Equity Management Non-discrimination in Employment or Education**

Content in this class has the potential to be disturbing to some individuals based on life experiences. If you ever feel the need to step out of the classroom or decline participation in an activity, please request an alternative learning experience.

UNI Policy 13.02 Discrimination, Harassment, and Sexual Misconduct states: "The University is committed to providing a workplace and educational environment, as well as other benefits, programs, and activities, that are free from discrimination and harassment based on a protected class, as well as retaliation."

Policy 13.02 outlines prohibited conduct and reporting processes. All University employees who are aware of or witness discrimination, harassment, sexual misconduct, or retaliation are required to promptly report to the Title IX Officer or Title IX Deputy Coordinator.

- Title IX Officer Leah Gutknecht, Assistant to the President for Compliance and Equity Management, 117 Gilchrist, 319.273.2846, [leah.gutknecht@uni.edu](mailto:leah.gutknecht@uni.edu)

- Title IX deputy coordinator: Christina Roybal, Sr. Associate Athletic Director Athletics Administration, North DOME 319.273.2556, christina.roybal@uni.edu

If you or someone you know has been harassed or assaulted, you can find the appropriate resources at [safety.uni.edu](http://safety.uni.edu) and [equity.uni.edu](http://equity.uni.edu). Resources that provide free, confidential counseling are also detailed at [safety.uni.edu](http://safety.uni.edu).

For additional information, contact the Office of Compliance and Equity Management, 117 Gilchrist Hall, 273-2846, [equity@uni.edu](mailto:equity@uni.edu).