Course Syllabus

This syllabus is meant to serve as an outline and guide for our course. Please note that the instructor may modify it with reasonable notice to you. The instructors may also modify the course schedule to accommodate the needs of our class. Any changes will be announced during lectures and posted on Canvas under Announcements.

Course Basics

Course: CS 2100: Discrete Structures
Credits: 3 credit hours
Prerequisites: C- or better in CS 1410: Introduction to Object-Oriented Programming and MATH 1210: Calculus I (or higher math).

Instructor:
Prof. Elaine Cohen(**u0028572@gcloud.utah.edu (mailto:u0028572@gcloud.utah.edu)**)

Teaching assistants: Will be filled in.

Lectures: Tuesdays and Thursdays 10:45a.m. - 12:05p.m. on **zoom**.

Discussions: Friday: 09:40a.m. - 10:30a.m. (cs2100-004), 10:45a.m.-11:35a.m. (cs2100-002), 11:50a.m.-12:40p.m (cs2100-003), 12:55p.m. - 01:45p.m. (cs2100-005).

Important Dates: Mark your calendar - quiz exams* and final exam may not be missed! ***All quizzes and the final exam will be online this semester (see General Rules for Exams (Quizzes(Exams) and Final Exam)***

Quiz 1	Tuesday, February 2 (during class time)
Quiz 2	Thursday, February 18 (during class time)
Quiz 3	Thursday, March 4 (during class time)
Quiz 4	Thursday, March 25 (during class time)
Quiz 5	Tuesday, April 20 (during class time)
Final Exam	Friday, April 30 (10:30 - 12:30)

Introduction. CS 2100 provides an introduction to the discrete mathematics and structures that are at the foundation of computer science, as well as teaches logical thinking about discrete objects and abstract things.

Fair warning. The **pacing in this class is brisk**. Students should be aware that not all of the topics they need to know will be covered during lectures. Students should spend a considerable amount of time reading, watching videos, studying, and solving problems outside of lectures.

The expected time needed for the class varies from one student to another. A general rule of thumb is the number of credit hours times 3 or 4 (that is, 9 hours to 12 hours) on average, depending on the student's background.

Lectures. Online in a combination of asynchronous pre-recorded lectures and remotely administered class reinforcement. For Zoom lecture class meeting ID and password, see **Important Online Links .**

Discussions. Held on Fridays and remotely administered by teaching assistants as per your schedule. See **Important Online Links**.

Zoom Sessions. Lectures, discussions, and office hours will be conducted over Zoom. Typically the lectures and discussions will be streamed and recorded so they can be viewed at later times. If you are uncomfortable with having your camera the whole session, you may turn it off. Please be aware that it is difficult for the teaching staff to teach to black screens if everyone has their cameras turned off, so we appreciate it if you can leave them on. Similarly, if you are uncomfortable with having your name on the screen, you can arrange with the instructor for a mutually agreed upon alias so that the instructor knows who you are, but your real name need not appear. After you are registered for this class, **go to the class Canvas web page for the meeting id and password listed under** "Important Online Links" in Modules

Announcements. Important announcements, such as assignment corrections or deadline changes, will be posted to the Canvas course page as public announcements. Make sure you set up canvas notifications appropriately to receive the announcements in a timely manner; ideally, you should receive an email notification as soon as an announcement gets posted.

Course Materials

Website. The class website is a Canvas course available through CIS. *It is always under development* with updates to the class schedule, course notes, homework specifications and more, occuring regularly. It is critical that students become familiar with the class website right away and *plan to visit it several times a week, at a minimum*.

Textbook. Discrete Mathematics: Mathematical Reasoning and Proof with Puzzles, Patterns, and Games by Ensley and Crawley (2006., ISBN-13: 978-0471476023). You are welcome to buy a used copy or rent the textbook. The course schedule lists the sections covered in each pre-recorded and class lecture. It is strongly recommended that you read these sections *before* they are covered in class.

Videos. Most CS 2100 topics are covered in videos posted well ahead of each lecture. Students should watch such videos *before* the associated lecture. Problems sets are assigned through Canvas with each pre-class video lecture to ensure that students prepare by watching videos and/or reading the textbook.

Course notes. The instructor often makes use of slides, sample problems, and other materials during the lecture. These items are posted on the class website; however, such posted items may not represent completely the material covered in class. Students who must miss class are strongly encouraged to check with a classmate.

Student Evaluation

Quizzes. Five quizzes will be given in class (online). Make-up quizzes will not be arranged for any reason other than a documented medical emergency. The four highest quiz scores for each student will be used to compute their final course grade (i.e., we will "drop" the lowest scoring quiz for each student); therefore, students who cannot be in attendance for one of the quiz dates above should plan to use their "drop" score accordingly. Students who cannot be in attendance for more than one of the quiz dates above should plan to take CS 2100 in a future semester. See **General Rules for Exams (Quizzes(Exams) and Final Exam)** . NOTE: In class quiz-exams are not the same as the lecture problem sets.

Final exam. The exam is cumulative (i.e., includes all course topics) and will take place on **April 30, 10:30am - 12:30p.m.** This date and time is not negotiable and may not be missed, per University policy. See **General Rules for Exams (Quizzes(Exams) and Final Exam)** .

Lecture problem sets. To ensure that students prepare adequately before each class lecture by watching videos and/or reading the textbook, lecture problem sets are assigned regularly as Canvas quizzes. The two lowest-scoring lecture problem sets will be dropped for each student. A lecture problem set is not timed, but it does have a strict deadline by which you must submit it. You should be able to solve most of them in 10-20 minutes.

Homework assignments. The specifications, deadline, and submission instructions for each assignment are posted on the class website. Give yourself time to think about the material. Plan on working on the assignments a little each day, and ask questions when you get stuck. Do not plan on solving an assignment all at once; it actually takes much longer to finish! Suggested steps for approaching CS 2100 homework assignments:

1. Read the relevant sections of the textbook in a timely way.
2. Try solving the practice problems, as well as the “blue” problems that are solved for you in the back of the textbook.
3. Try solving the assigned homework problems.
4. If you are struggling with either step 2 or 3, try doing the online activities on the textbook’s website: (**goo.gl/JLJfLB (http://goo.gl/JLJfLB)**).

5. If you are still struggling after step 4, make use of the instructor's office hours and/or the TA help hours (see **How to get help in CS 2100**).

Homework assignments are to be done independently. It is acceptable for students to discuss how to solve problems with classmates, but copying solutions is considered academic misconduct. It is the student's responsibility to ensure the successful and timely submission of each assignment via *Gradescope* — start early and follow the instructions carefully. Corrupted or missing files are not grounds for extensions — double-check your submissions and save a digital copy of all of your work on your computer. See **Homework Grading and Submission Explained**.

The lowest scoring homework assignment for each student will be dropped.

Grading policy. The final course grade is based on the 5 in-class quizzes (best 4 out of 5 for 60% - the lowest quiz grade is dropped), final exam (20%), lecture problem sets (10% - the two lowest lecture problem sets grades are dropped), and 7 homework assignments (10% - the lowest homework assignment grade is dropped). The letter grading policy is as follows, where x is your final score:

	87<=x<90 B+	77<=x<80 C+	67<=x<70 D+	
93<=x A	83<=x<87 B	73<=x<77 C	63<=x<67 D	0<=x<60 E
90<=x<93 A-	80<=x<83 B-	70<=x<73 C-	60<=x<63 D-	

Basically, there will be no rounding of scores. For example, 93.00 gets you an A, while 92.99 gets you an A-.

Regrading for homework and quiz Students who wish to appeal a score on a homework assignment or a quiz must do so within *one week* of the score being posted to the student in Gradescope.

Regrading for lecture problem set Students who wish to appeal a score on a lecture problem set must first post a private question to the teaching staff on Piazza under the folder "Lecture x" (where x is the corresponding lecture number for the problem set, e.g, "Lecture 2") that includes a detailed description of the problem and the reason for the appeal. In the majority of the cases, these questions are not regraded due to mistakes made by the students.

In rare cases, when the teaching staff has decided and confirmed with the student that a regrade is indeed needed:

1. The student must formally send a request of regrading under the folder "Lecture x" (where x is the corresponding lecture number, e.g, "Lecture 2") titled "Regrading Request" as a private message to the teaching staff on Piazza. Such a formal request has to be made within *one week* of receiving the score.
2. Then the TA () will perform the regrading manually.

In summary, regrading for the lecture problem set is dealt with on a case-by-case basis via Piazza.

Getting Help

To get help understanding course material, students may see the Teaching Assistant(s) during TA Help Hours, see the instructor during Instructor Office Hours, post a question to the Q&A forums on **Piazza (https://piazza.com)** , or contact the course staff directly (also via Piazza).

Please do not use Canvas to message instructor/TAs, use Piazza instead.

Do not be shy if you do not understand something so that you do not fall behind: come to office hours, post questions on Piazza, or speak up during recitation and discussion sessions!

The teaching staff will aim to address questions posted on Piazza in a timely manner during regular work hours (9 am to 5 pm, Mon-Fri). Questions posted in the evenings or during weekends will typically be addressed during regular work hours in the following day or week, respectively. While the teaching staff may occasionally respond in the evenings or weekends, however, this is not to be expected. Please make sure you post your questions during regular work hours for timely responses.

See **How to get help in CS 2100** for details.

Course Outline

The following outlines the modules planned for study and the corresponding chapters in the textbook, as well as the motivation for each topic. See the class website (Canvas) for a detailed schedule.
Mathematical Reasoning – Chapter 1: Logic is a natural and familiar concept, giving students the opportunity to practice mathematical thinking while getting comfortable with formalization and abstraction. Moreover, in the study of propositions and logical equivalencies, students explore Boolean expressions from a perspective that enhances their ability to use them effectively in programming.
Mathematical Writing – Chapter 2: Students learn to read and write about mathematics formally, in a variety of contexts. Giving a mathematical argument about new material tests a student's ability to reason. Furthermore, in the study of inductive proofs, students explore recursive reasoning from a perspective that enhances their ability to use recursion programmatically.
Set Theory – Chapter 3: By studying sets, students exercise the problem-solving and proof-writing skills learned in previous modules. Also, students are introduced to sets as abstract mathematical structures that represent discrete objects and to the relationships between these objects. Finally, students observe how abstraction (e.g., Boolean algebra) makes certain computations (e.g., logic circuits) easier.
Functions and Relations – Chapter 4: By studying functions as binary relations, students get a perspective on functions that are different from their exposure to functions in calculus courses. By viewing a relation as another example of an abstract mathematical object, students realize that it may be thought of as a set and that all of the material from the previous module applies.
Combinatorics and Probability – Chapters 5 and 6: Students learn combinatorial analysis in order to count elements in problem-solving. This knowledge is then leveraged to determine the probability of an event happening. For problems that appear difficult to solve (i.e., count), students learn how to use one-to-one correspondence from the functions module to see that two problems, which appear to be different, actually have the same solution.
Graph Theory – Chapter 7: In earlier modules, graphs are used to visualize or simplify difficult concepts

(e.g., arrow diagrams for functions and relations, game trees for best-of-X series for probability). Students learn the basics of graph theory not only to better understand these previous applications, but also to lay the foundation for using graphs in other subfields of computing, such as circuit design, networking, scheduling, and more. Finally, by reading and writing proofs about graphs, the critical concept of induction is revisited.

Policies and Guidelines

Online etiquette. Students and the teaching staff (instructors and TAs) are expected to create a respectful online learning environment. All online interactions (including but not limited to emails, Piazza, Canvas, Zoom) are expected to follow common rules for good online etiquette:

- Be respectful and be professional.
- Be aware of strong language, all caps, and exclamation points.
- Be careful with humor and sarcasm.
- Do not post or share (even privately) inappropriate material.

Disrespectful or inappropriate online communications will be deleted from online platforms (e.g., Piazza and Canvas). Severe cases may be referred to the appropriate committee or office within the University for possible disciplinary actions.

Academic misconduct policy. For the CS 2100 misconduct policy, see **policy.pdf**. We will adhere by the **School of Computing policy on academic misconduct (https://www.cs.utah.edu/docs/misc/cheating_policy.pdf)** . For information on withdrawing from courses, appealing grades, and more, see the **College of Engineering Guidelines (https://www.coe.utah.edu/students/academic-affairs/academics/semester-guidelines/)** .

Make sure to familiarize yourself with the above policies!

Documented (Medical) Emergency

Homework deadline extensions or make-up exams will not be arranged for any reason other than a documented medical emergency. A documented medical emergency is defined as a **verifiable document from a doctor's office** or a proof of **positive COVID-19 testing result**. Getting a COVID-19 test by itself is not a medical emergency.

Once approved, the student will get a 5-day extension (including weekends) for a homework assignment. The student has to complete a make-up exam within 5 business days of the original day of the exam.

Such a document should be (preferably) provided 1 day before the deadline.

If the students will miss 1-2 Lecture Problem Sets, no extensions will be given (since 2 problem sets are dropped from the final score). If the student will miss more than 2 lecture problem sets, this will be dealt with on a case by case basis.

Documented emergency other than medical emergencies (e.g. loss of power) will be dealt with on a case by case bases. Please email the instructor with documented proof of the emergency (e.g. from the power company). Such a document does not automatically guarantee approval.

Inclusivity

It is our intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.

We also expect students to treat others in the class, including the teaching staff, with the same level of respect.

Your suggestions on how we can make the course more inclusive and welcoming are encouraged and appreciated. You can give us feedback in person during office hours, or **through our anonymous form. (https://forms.gle/RAbNMWBk29Mfe79r9)**

We take incidents of discrimination, bias, and harassment seriously. We will file reports with the **Office or Equal Opportunity, Affirmative Action, and Title IX (OEO) (https://oeo.utah.edu)** about such incidents. If you are unsure what differentiates free speech and professional behavior from discrimination, bias, and harassment we are happy to have an open, judgment-free, and confidential conversation with you, or refer you to the OEO.

U of U Office of Inclusivity (https://inclusive-excellence.utah.edu)
Center for Ethnic Student Affairs (http://diversity.utah.edu/centers/cesa/)
LGBT Resource Center (https://lgbt.utah.edu)
American Indian Resource Center (http://diversity.utah.edu/centers/airc/)
Office of Equal Opportunity, Affirmative Action, and Title IX (https://oeo.utah.edu)
Center for Student Wellness (http://wellness.utah.edu)

Students with disabilities The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the **Center for Disability and Access (http://disability.utah.edu)**. CDA will work with you and the instructor to make arrangements for accommodations. Accommodations cannot be given without paperwork from this office.

Addressing sexual misconduct Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity

and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

Student names & personal pronouns Class rosters are provided to the instructor with the student's legal name as well as "Preferred first name" (if previously entered by you in the Student Profile section of your CIS account). Please advise the instructor of any name or pronoun changes (and update CIS) so we can help create a learning environment in which you feel respected. If you need assistance getting your preferred name on your UID card, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email bpeacock@sa.utah.edu to schedule a time to drop by. The LGBT Resource Center hours are M-F 8 am-5 pm, and 8 am-6 pm on Tuesdays.

Student wellness Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness at www.wellness.utah.edu or 801-581-7776.

Veterans center If you are a student veteran, the U of Utah has a **Veterans Support Center (http://veteranscenter.utah.edu)** located in Room 161 in the Olpin Union Building. Hours: M-F 8-5 pm. Please visit their website for more information about what support they offer, a list of ongoing events, and links to outside resources. Please also let the instructors know if you need any additional support in this class for any reason.

Learners of English as an additional/second language If you are an English language learner, please be aware of several resources on campus that will support you with your language and writing development. These resources include the **Writing Center (http://writingcenter.utah.edu)**, the **Writing Program (http://writing-program.utah.edu)**, and the **English Language Institute (http://continue.utah.edu/eli)**. Please let the instructor know if there is any additional support you would like to discuss for this class.

Safety

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit **safeu.utah.edu (https://safeu.utah.edu/)**.

(http://www.regulations.utah.edu/academics/guides/students/studentRights.html)