

Syllabus for CSCI 150: Discrete Structures

Professor **Susan L. Epstein**

Email: susan.epstein@hunter.cuny.edu

Lectures: Mondays and Thursdays 11:30 AM - 12:45PM

Mode of instruction: P (in person)

Recitations: once weekly, by registration only

Office hours on Zoom: Mondays and Thursdays 4 - 5 PM (link is posted on the course website)

Course website: On Blackboard, accessible through the CUNY Portal with Chrome, Firefox, or Safari

Department office: 1008 Hunter North

Department phone: 212-772-5213

Course description

The tools necessary to store and process data and instructions in a computer are called *discrete structures*. CSCI 150 teaches you how to **first think about, and then represent and manipulate, data and instructions** for a computer. CSCI 150 introduces you to logical formalisms, rigorous reasoning, and extensive mathematical concepts, notation and conventions. **All your subsequent CSCI courses will assume that you know this material.** Consider CSCI 150 an investment in your future.

Our 150 philosophy

The only way to learn this material is to read about it, listen to an explanation, ask questions, read about it again, and **work a lot of problems**. We believe that watching someone else solve problems like these is no substitute for transferring these skills to your own brain. **This 4-credit course demands considerable time: 6 – 10 hours outside classes every week.**

- Lectures are on Mondays and Thursdays 11:30 AM - 12:45PM. Each lecture will require you to complete and submit a new Opening Sheet before you leave. If you do not, you will receive a 0. Much of your education will only be available from lectures, so be sure to take notes. Questions during lecture are welcome.
- Recitation is your principal place for individual instruction. Each time your recitation meets you receive a recitation score. If you are absent, that will be a 0. Come prepared to both ask and answer questions.

Preparation for CSCI 150

- **Prerequisites:** You should have tested out of or completed one of the **prerequisites** (MATH 125.00, MATH 125.50, MATH 150.00 or MATH 155.00) before the semester begins **with a C or better**. The CSCI Department **does not accept CR grades** toward the major except those received at Hunter in Spring 2020 or Fall 2020.
- **Registration.** You must be **registered both for the CSCI 150.00 lecture and for a Fall CSCI 150 recitation section** numbered 15000 - 1Rx where x is in $\{01,02,03,04,05,06,07,08,09,10\}$.
- **Entry-level math:** A **solid foundation in mathematics** is necessary to succeed in this course. The following material should have been covered in your high school math classes and/or your prerequisite course. Feel free to ask questions about it during your first recitation class.
 - Properties of the real numbers:** Covered in your textbook in Appendix A.
 - Algebra:** how to add, subtract, multiply and divide algebraic expressions and algebraic fractions, rules of exponents, how to solve linear and quadratic equations with 1 or 2 variables
 - Functions:** $f(x)$ notation, how to draw and interpret graphs of functions, general familiarity with exponential and logarithmic functions and their graphs
 - Geometry:** how to compute the distance between 2 points, how to compute the area of common shapes
 - Trigonometry:** familiarity with the unit circle, definitions and graphs of sine, cosine, and tangent
- **Get the required textbook:** Epp, Susanna S.; *Discrete Mathematics with Applications, Fourth Edition*; Brooks/Cole–CENGAGE Learning; 2011; ISBN-13 978-0-495-39132-6. **Download it free here:** [https://vulms.vu.edu.pk/Courses/MTH202/Downloads/2Discrete Mathematics with Applications by Susanna S. Epp - 4th Edition.pdf](https://vulms.vu.edu.pk/Courses/MTH202/Downloads/2Discrete%20Mathematics%20with%20Applications%20by%20Susanna%20S.%20Epp%20-%204th%20Edition.pdf)
- **Read this document carefully.** Feel free to ask questions about it during your first recitation class.
- **Check that your CUNY First email address is up to date.** That is how we will communicate with you about the course, and how Gradescope and Blackboard will recognize you. **If you are a transfer student**, Blackboard doesn't automatically update your email when you change campuses. To change your

Blackboard mailing address, follow the directions at
<https://writingcraft.commons.gc.cuny.edu/files/2020/07/ChangeEmailAddressSP13.pdf>

Course policies: no exceptions, no discussion, no excuses

We are required to grade all students equally in accordance with the rules set out in the syllabus. Under Hunter's Academic Integrity Policy, seeking special treatment beyond the rest of the class is obtaining an unfair advantage. To ensure fair and even treatment of all students in this large class, CSCI 150 has **non-negotiable policies**:

- **If we can't read it, it is wrong.**
- **Problem sets must be uploaded to Gradescope with answers in YOUR handwriting on OUR template.**
- **We do not accept late problem sets.** Failure to submit on time earns you a 0.
- **We do not offer makeup exams.** Failure to take any exam at the appointed time earns you a 0.
- **We do not offer extra credit opportunities.**
- **We only credit lecture attendance for the Opening Sheet you personally submit during lecture.**
- **We only credit recitation attendance if you are present for at least 30 minutes in the section for which you are registered.**

Rather than entertain any reason (e.g., illness, ignorance, sorrow, vacation, equipment failure), instead we:

- Calculate your problem set grade, without the 2 lowest ones (out of 14) and average those that remain.
- Calculate your recitation grade, without the 2 lowest ones (out of 14) and average those that remain.
- Replace any 0 on either of the first 2 tests (there are 3 in all) with your score on the final test.

Lectures and recitations

Lecture meets 28 times during the semester. (Two of those meetings will be 75-minute tests.) When you come into lecture, **pick up an Opening Sheet from a UTA**. Enter your CUNYFirst name, Hunter ID number and section number, answer the warmup questions there, and **hand it to a UTA as you leave**. That's how we will know you were there and are keeping up with the course.

No recording: You may not record lectures or recitations without express permission from the instructors. Instead, we recommend that you take notes. **Taking notes by hand on paper or on a tablet actually helps you learn.** It forces you to concentrate and to think about what is important.

Problem sets

No late submissions will be accepted and no extensions will be granted for any reason.

To construct your problem set submission, download the pdf template for that problem set from the class website, enter your Hunter ID number and your section number on the first page

- **Answers must be in your own handwriting and only in their designated boxes.**
- If you can't answer a question, leave its box blank.
- **Do not edit the template in any way.** Only submissions on the template as posted will receive any credit.
- **Do not put your name anywhere on your submission.**

To submit your answers, you must upload them to Gradescope. Your instructor will demonstrate how to do this at your first recitation meeting. Clear instructions are also available at

https://gradescope-static-assets.s3.amazonaws.com/help/submitting_hw_guide.pdf

Problem sets are designed to increase your understanding of the material, and **should be done over several days**. If you can do all the problems correctly **by yourself**, you should do well on the tests. Most problems are from an Exercise Set at the end of a section in your textbook. For example, §4.2.13(b) is part (b) of problem 13 at the end of section 4.2 in Chapter 4's Exercise Set 4.2. **All parts of a problem are assigned unless otherwise indicated.**

Team work. Try to do all the problems on your own. If you work with other CUNY students, you must enter **every such person's** CUNYFirst ID on the first page of the Problem Set template. If you use an online reference

or any other source, you must enter the complete url or citation for it. **Failure to report whom you worked with or where you found your answers is an integrity violation and will be reported.**

Follow directions. Your textbook often lists, in blue, directions for a group of problems. For example, "Indicate whether the arguments in 21–27 are valid or invalid. Support your answers by drawing diagrams."

Appendix B: Help on some problems can be found in Appendix B. Solutions to earlier numbered problems in the same Exercise Set often suggest how to solve later ones. A blue problem number (e.g., §3.4.22) means the solution is in Appendix B. A blue *H* next to a problem (e.g., §3.3.45) means there is a hint for it in Appendix B.

Test protocol (sent by email)

Once again we will ask you to wait outside the doors until we have "set up" the room. You may bring an 8.5x11" "cheat sheet" with information on both sides. There will be multiple different, equally fun versions of each test.

When you come in you must find the exam that has your name on it. (They will be in **alphabetical order**.)

No one will be allowed to take the test if they arrive more than 30 minutes late.

The test format is much like the first one. .Once again:

- Write your answers **in the boxes provided**. Only the parts of the answers that you write down will be graded. Support all your answers.
- **If you leave the room for any reason, you must hand your exam to a proctor and may not return.**
- **You may not use:** your textbook, your notes, anyone else's textbook, anyone else's notes, or anyone else's work.
- **You may not use** a calculator, computer, cell phone, or any other electronic device.
- **You may not enlist the aid of** any persons, spirits, or other agents, human or artificial.
- **If we are unable to read your answer, the answer is wrong.** Be sure to write legibly. Tiny writing, faint writing, and poor writing can adversely affect your grade. Professor Epstein's eyes are the judge of "legible", and her eyes are older than yours.

How we grade

Get credit for your work: All Opening Sheets, problem sets and tests require your **CUNYFirst Hunter ID number and section number in the boxes on the first page**. Only Opening Sheets and tests require your CUNYFirst name too.

Clarity and correctness: Answers on problem sets and tests must be **legible and unambiguous**. If it is illegible or has more than one meaning, it is wrong. If a question is of the form "prove that" or "show that," then you must give an unambiguous, logically sound formal argument that uses only the facts established in the pages of the textbook preceding the exercise. **All mathematical notation must be consistent with our lecture slides.**

Gradescope: Problem sets and tests will be marked in Gradescope. We use Gradescope because it allows us to mark uniformly and anonymously. Graders do not know the identity of students when they grade. You will receive email from Gradescope when we publish the grades.

We grade all of each test **but only some of each problem set**. Your TAs and UTAs will not know which problems will be graded until after the submission deadline

Regrade requests: We grade carefully but if you believe that one of your answers has been graded incorrectly, you can request that we look at it again. Any regrade request **must be done through Gradescope and must be submitted within 48 hours of the grade's publication**. Gradescope notifies us of all regrade requests. Regrades will be addressed by a recitation instructor. Thus, you will subject your answer to a more critical pair of eyes and **may risk a reduction**, rather than an increase, in your grade. **Regrade decisions are not negotiable**. Do not send email with a regrade request, and do not send repeated requests for the same problem. Directions for how to make a request are here: <https://help.gradescope.com/article/8hchz9h8wh-student-regrade-request>

Your final CSCI 150 grade has 5 components

- **20% participation:** This will be based on the 26 Opening Sheets you complete at lectures and your performance at the 14 meetings of your recitation section. If you miss a lecture or a recitation, your score for it will be a 0. If you attend recitation but do not participate in class that day, your score will be a 70. Active participation will earn you a higher recitation score, and asking questions counts.
- **20% problem set average:** There will be 14 problem sets. **Submit answers in your own handwriting on the correct template for each problem set as one pdf by 11PM** on the date on our website's calendar.
- **20% test 1 score:** a 75-minute test that covers the material addressed in lectures 1-8.
- **20% test 2 score:** a 75-minute test that emphasizes the material addressed in lectures 9-16 but requires knowledge of the material addressed in lectures 1-8.
- **20% final test:** a 120-minute test during final exam week. Part will cover lectures 17-26; the remainder will emphasize the earlier material in the course.

Okay, so think about our grading policy for a moment. If you never go to recitation and never submit problem sets, perfect scores on the three tests (not at all likely) will earn you a 60 That's a D. Even one less than perfect answer will result in an F. Clearly we believe **you will learn by coming to lecture and recitation and by solving problems by yourself.**

We do not curve grades. What about the reading we assign on our website's calendar? We will be able to tell if you do it, from the quality of your questions and answers in recitation and on the tests.

Policy on electronics in the classroom

All cell phones, watches, and other electronic devices must be *inaudible* during class. We expect laptops and other electronic devices to be used *only for class related activities*. Activities not related to class include but are not limited to web surfing, email, games, videos, and social networking web sites (such as Facebook, Twitter, TikTok). Any student with an electronic device that disrupts the class or is used for **anything other than class-related activities will lose two (2) points from their final average per occurrence.**

Dedicated UTA tutoring

Our Undergraduate Teaching Assistants offer extensive in-person tutoring at the CSCI 150 table in the Dolciani Lab <https://www.hunter.cuny.edu/dolciani>. The tutoring schedule will be posted on the course website. UTAs are selected for their prowess and their helpfulness, but they get paid *not* to do your homework for you. Please do not try to compromise their integrity; they are deservedly proud of their work.

For the quickest response to questions...

I eventually answer all queries to my personal email, but the csci150@hunter.cuny.edu email is **prioritized** and handled by other instructional staff when I'm unavailable.

How to succeed in CSCI 150

The amount of time you devote to CSCI 150 will depend upon your interest, your mathematical background, and your ability to read technical material. **Plan on 6-10 hours outside of class every week.**

- **Attend lecture — it's required!** Fill out and return the Opening Sheet at every lecture.
- **Attend recitation — it's required!** Ask and answer lots of questions.
- **Do the reading.** *Read before* lectures and then *read again* after lectures, *before* you attempt the problem sets.
- **Ask questions** whenever and wherever you are most comfortable: recitation, lecture, tutoring, or office hours.
- **Watch the deadlines** on the course website carefully.
- **Do the weekly problem sets.** Allow plenty of time for them.
- **Study for tests by doing even more problems.** Your text has lots of problems, some with answers.
- **Study your graded problem sets and tests.** Look carefully at the reasons we deduct points so you can do better next time. Similar questions may appear in subsequent problem sets and tests.
- **Find a study team.** When you get stuck on a problem, it really helps to talk it through with someone.

- **Read** your @myhunter **email** daily.
- **Keep pace with the course.** The material in CSCI 150 builds on previous topics.

Trustworthy sources

Do not go web surfing. There is a plethora of incorrect "information" out there.

Online

Lovász & Vesztergombi, *Discrete Mathematics Elementary and Beyond*

<http://www.cs.hunter.cuny.edu/~saad/courses/dm/dmbook.pdf>

How to Write Proofs <http://zimmer.csufresno.edu/~larryc/proofs/proofs.html>

Lehman, Leighton, & Meyer, *Mathematics for Computer Science*, <https://ocw.mit.edu/courses/6-042j-mathematics-for-computer-science-fall-2010/pages/readings/>

Stein, Drysdale & Bogart, *Discrete Mathematics for Computer Scientists*

[http://cslabcms.nju.edu.cn/problem_solving/images/1/1f/Discrete Mathematics for Computer Scientists.pdf](http://cslabcms.nju.edu.cn/problem_solving/images/1/1f/Discrete_Mathematics_for_Computer_Scientists.pdf)

Books

Anderson, *A First Course in Discrete Mathematics*, Springer.

Grimaldi, *Discrete and Combinatorial Mathematics*, 5th edition, Pearson Addison-Wesley

Lewis and Zax, *Essential Discrete Mathematics for Computer Science*, Princeton University Press.

Rosen, *Discrete Mathematics and its Applications*, 8th edition, McGraw Hill

Learning Outcomes

The successful student will acquire the mathematical foundations needed for later computer science classes such as automata theory, formal languages, cryptography, relational database theory, and data structures. They will understand and be able to construct proofs, particularly those involving discrete structures. They will demonstrate this mastery by solving problems and supplying proofs during recitation discussion and on written homework, and tests. This class directly supports Departmental Learning Outcomes 1A (“demonstrate an understanding of the basic foundations ... of mathematics and statistics ...”) and 1C (“display knowledge of the theory of computation and algorithms”).

Hunter / CUNY policies

Policy on Academic Integrity: Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic of academic dishonesty according to the Hunter College Academic Integrity Procedures.

ADA Compliance: In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/ or Learning) consult the Office of AccessABILITY located in Room E1124 to secure necessary academic accommodations. For further information and assistance please call (212-772-4857)/TTY (212-650-3230).

Hunter College Policy on Sexual Misconduct In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College’s Public Safety Office (212-772-4444).

b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College’s Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry

(colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123. <http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-with-links.pdf>

Policy on bullying Bullying, cyber bullying, online hate, initialization intimidation, threats, harassment, and pressure to share schoolwork are all forms of violence, CUNY holds a zero-tolerance stance toward all such acts. The University is committed to prevention of any form of bullying, will respond promptly to threats and/or acts, and will protect victims of bullying from retaliation. As a criminal matter the New York Attorney General defines cyberbullying as the use of email, websites, instant messaging, chat rooms, text messaging, and digital cameras to antagonize and intimidate others. Disrupting a teleconferencing platform (such as Zoom, Skype, Blackboard Collaborate Ultra) is a federal crime.

Note: Details of this document, including grading percentages, are subject to change as the need arises.