

CSCI 36500 §001 # 2705 Computer Theory II and  
CSCI 72400 §01 # 5499 Spring 2021

Eric Schweitzer

January, 2021

**Text:** Hopcroft, Motwani & Ullman, *An Introduction to Automata Theory, Languages and Computation 3rd edition*, Addison Wesley, ISBN 0-321-45536-3.

**Web** Useful links, including an updated version of this syllabus and all the home work assignments, are available on <http://www.cs.hunter.cuny.edu/~eschweit/>.

**Finding your Professor:** I can be reached to make appointments etc. by contacting me before or after class, by phoning my office at (212)772-4349 or Zoom-ing to <https://us02web.zoom.us/j/4678462663> during my scheduled office hours (Mondays 5:00 - 6:00 and Thursdays 2:30-3:30), or (by far the best way) by sending me e-mail at [eric.schweitzer@hunter.cuny.edu](mailto:eric.schweitzer@hunter.cuny.edu). Please note that I will only read plain ASCII text email, not HTML or MicroSoft Word encoded documents. Also note that any email concerning anything that might fall under the FERPA regulations (e.g. questions about grades or other class related issues) *must* be sent from your “myhunter” account.

Once upon a time messages could be left for me at the Computer Science Department office, which is located in N-1008 and is reachable at (212)772-5213. Perhaps this will again be true someday.

**36500 Grades:** Grades will be based on a midterm exam, a final exam, and a short paper.

- The midterm exam will be given on Wednesday March 24. It is worth 45% of your final grade.
- The Final will be given at the appointed hour during finals week. This is currently Monday, May 24, 6:20-8:20, however the College may change this schedule. The Final will be 45% of your grade.
- The paper, worth the remaining 10% of your grade, will be a short (4-6 pages, not including notes or bibliography) paper about something you find interesting that is related to the class. It will be due Monday May 3. You are encouraged to use L<sup>A</sup>T<sub>E</sub>X to create it. More details will follow.

**72400 Grades:** Grades will be based on a midterm exam, a final exam, and a longer paper.

- The midterm exam will be given on Wednesday March 24. It is worth 45% of your final grade.
- The Final will be given at the appointed hour during finals week. This is currently Monday, May 24, 6:20-8:20, however the College may change this schedule. The Final will be 45% of your grade.

- The paper, worth the remaining 10% of your grade, will be a longer (8-12 pages, not including notes or bibliography) paper about something you find interesting that is related to the class. It will be due Monday May 3. It must be created with L<sup>A</sup>T<sub>E</sub>X. More details will follow.

Exams will be distributed as .pdf’s via BlackBoard and are timed. You will be given a few minutes to upload the completed exam (preferably as a pdf) to GradeScope. **You MUST be able to print, write on and scan a pdf document, or print, write on and photograph a pdf document, or write directly on a pdf and upload it to GradeScope.** Gradescope ([www.gradescope.com](http://www.gradescope.com)) will be used to collect exams and to disseminate grades on those exams. Expect to get email from them at your “myhunter” address after the first week of classes. Because Gradescope does optical character recognition, you will have to write your name, EMPLID and answers legibly. Failure to do so may result in incorrectly recorded grades.

I do not give “extra credit” assignments. Do not expect to be able to pull up your grade by doing additional work. Do expect to do the assigned work in a timely manner. You need to do problems in order to understand the material, and you need to master material before you move on to more advanced material. It is easy to fall behind and very difficult to catch up.

**Topics, Goals or Outcomes:** This is a “theory” course. To succeed, you will have to understand some abstract concepts (“machines” and “languages”). You will need to use them, and mathematical reasoning, to understand and construct proofs. We will spend the semester focusing on “recursive” and “recursively enumerable” languages and various machine models (“Turing machines”, “Post machines”, etc.) that accept them. We will also delve into time and space bounds and the complexity classes these bounds give rise to.

The successful student will demonstrate mastery of the subject by constructing proofs and solving problems related to the subject matter on exams, and by clearly presenting related material in their papers.

This course supports departmental learning goals 1A, 1C and 1D, by exposing the student to the mathematics that underlies the theory of computation, 3C, by giving them the theoretical underpinnings of complexity theory, and 3A, by requiring a paper and written exams.

We will try to hew the following schedule:

Week	Topic	Sections
1	265 review, PLs for CFLs and RLs, TMs	
2 and 3	CFL Closure and Decision Algs.	7.2-7.4
3 and 4	TM techniques and extensions	8.3, 8.4
5	Special TMs, TMs and computers	8.4, 8.5
6	Undecidability	9.3
7	Review and Exam	
8	P and NP	10.1
9 and 10	NP-completeness and SAT	10.2, 10.3
11 and 12	More NP-complete problems, co-NP	10.4, 11.1
13	P-space and P-space completeness	11.2, 11.3
14	Review and catch-up	

**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 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 E1214B, to secure necessary academic accommodations. For further information and assistance, please call: 212-772-4857 or 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. CUNY Policy on Sexual Misconduct Link:

<http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-with-links.pdf>

**Note** that details of this document are subject to change if the need arises.