

CS420 INTRO TO THEORY OF COMPUTATION

Spring 2024 Syllabus

- Class time & location: there are two sections:
 - Tue & Thu 4:00PM - 5:15PM @ University Hall Y02-2130
- Instructor: Prof. Duc A. Tran (duc.tran@umb.edu, McCormack M03-201-18)
 - Office hours: Tue & Thu 2PM – 4PM (other time by Zoom only)
- Class website: <http://www.cs.umb.edu/~duc/www/teaching/cs420/>

My email to the class will be sent from the WISER system, so make sure that your email address is set up correctly with WISER. You should also visit the website regularly.

Topics

CS 420 is an introductory course covering the key concepts and theorems of the theory of computation. It is intended for upper-level undergraduate students. The tentative list of topics is as follows:

- Automata and Language Theory
 - Finite automata, regular expressions, push-down automata, context free grammars, pumping lemmas.
- Computability Theory
 - Turing machines, Church-Turing thesis, decidability, halting problem, reducibility.
- Complexity Theory
 - Time complexity (measuring complexity, P, NP, NP-completeness).
 - If time permits: Space complexity (PSPACE, PSPACE-completeness, L, NL-completeness).

Prerequisites

- CS220 Discrete Mathematics
- Important note: You need a good understanding of the mathematical concepts of theorem and proof. Lectures and assignments in this course require proving statements and some creativity in finding the proof will be necessary.

Textbook

- *Introduction to Theory of Computation by Michael Sipser, 3rd edition.* You can use the 2nd edition, but the homework will be based on exercises extracted from the 3rd edition.

Grading

- Homework (30% of final grade): There are 5 homework assignments, each worth 6% of the total grade.
- Test 1 (20% of final grade, in-class): March 21
- Test 2 (20% of final grade, in-class): April 23
- Final Exam (30% of final grade, in-class): to be determined by the University (will be available on Wiser)

Threshold (%)	93	90	87	83	80	77	73	70	67	63	60	<60
Letter grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F

Late Homework and Makeup Policies

Unless a good reason and its supporting evidence are given, e.g., due to illness, emergency, important events:

- No makeup is granted for students missing a homework assignment or an exam.

- Homework may be submitted late by no more than 24 hours, weekend and holiday counted. The penalty for late submission is 10% of the homework grade.

Accommodations

The University of Massachusetts Boston is committed to providing reasonable academic accommodations for all students with disabilities. This syllabus is available in alternate format upon request. Students with disabilities who need accommodations in this course must contact the instructor to discuss needed accommodations. Accommodations will be provided after the student has met with the instructor to request accommodations. Students must be registered with the Ross Center for Disability Services, CC UL 211 (617.287.7430) before requesting accommodations from the instructor. <http://www.umb.edu/academics/vpass/disability/>. After registration with the Ross Center, a student should present and discuss the accommodations with the professor. Although a student can request accommodations at any time, we recommend that students inform the professor of the need for accommodations by the end of the Drop/Add period to ensure that accommodations are available for the entirety of the course.

Academic Integrity and Code of Student Conduct

It is the expressed policy of the University that every aspect of academic life not only formal coursework situations, but all relationships and interactions connected to the educational process shall be conducted in an absolutely and uncompromisingly honest manner. The University presupposes that any submission of work for academic credit indicates that the work is the student's own and is in compliance with University policies. In cases where academic dishonesty is discovered after completion of a course or degree program, sanctions may be imposed retroactively, up to and including revocation of the degree. Any student who reasonably believes another student has committed an act of academic dishonesty should inform the course instructor of the alleged violation. These policies are spelled out in the Code of Student Conduct. Students are required to adhere to the Code of Student Conduct, including requirements for academic honesty.

Link: [UMB Code of Student Conduct](#)

You are encouraged to visit and review the UMass website on Plagiarism: [Plagiarism Prevention & Awareness: Home](#)