

Syllabus - Fall 2020

Course and Instructor Information

Course Title: CSE 3502 (Theory of Computation)

Credits: 3

Prerequisites: CSE 2050 or 2100; and 2500 (open only to students in the School of Engineering, Cognitive Science majors, and declared Computer Science or Cognitive Science minors.)

Meeting time: MWF 11:15am - 12:05pm

Classroom: HuskyCT -> Blackboard Collaborate Ultra (synchronous online classes)

Official Announcements and Grades: We use the HuskyCT system available at learn.uconn.edu.

Instructor: Kriti Bhargava

Email: kriti.bhargava@uconn.edu

Office Hours: TBD

Course Description

The objective of this course is to introduce to the theory of computation covering the following three branches of theoretical computer science:

- Automata and Language Theory (~3 weeks)
 - Finite automata, regular expressions, push-down automata, context free grammars, pumping lemmas.
- Computability Theory (~4 weeks)
 - Turing machines, Church-Turing thesis, decidability, halting problem, reducibility, recursion theorem.
- Complexity Theory (~6 weeks)
 - Time and space measures, hierarchy theorems, complexity classes P, NP, L, NL, PSPACE, BPP and IP, complete problems, P versus NP conjecture, quantifiers and games, provably hard problems, relativized computation and oracles, probabilistic computation, interactive proof systems. Possible advanced topic as time permits.

Course Objectives

At the end of the course, a student who successfully completes the course will:

- Be familiar with key notions of computation, such as algorithm, computability, decidability, reducibility, and complexity through problem solving.
- Be able to explain the models of computation, including formal languages, grammars and automata, and their connections.
- State and explain the Church-Turing thesis and its significance.
- Be able to analyze and design finite automata, pushdown automata, Turing machines, formal languages, and grammars.
- Be able to solve computational problems regarding their computability and complexity and prove the basic results of the theory of computation.

Course Materials

Required text: [Introduction to the Theory of Computation, 3rd Edition by Michael Sipser](#)

Course Workload

Homework and programming assignments:

There will be 5-6 biweekly assignments, which will include both problem solving and paper submission.

Course Requirements and Grading

Summary of Course Grading:

Course Components	Weight
Assignments	30%
Midterm exam	20%
Final exam	30%
Class participation	20%

Grading Scale:

Grade	Letter Grade	GPA
93-100	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7
77-79	C+	2.3
73-76	C	2.0
70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	D-	0.7
<60	F	0.0

Due Dates and Late Policy

Typically, one week would be given for submission of each assignment. The due dates will be specified in each assignment. Deadlines are based on Eastern Standard Time; if you are in a different time zone, please adjust your submittal times accordingly. Late submissions will be permitted until 12 hours after the specified deadline but would result in reduction of 30% marks from the assignment. *The instructor reserves the right to change dates accordingly as the semester progresses. All changes will be communicated in an appropriate manner.*

Feedback and Grades

Your grade will be posted in HuskyCT. To keep track of your performance in the course, refer to My Grades in HuskyCT.

Student Responsibilities and Resources

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important [standards, policies and resources](#), which include:

- The Student Code
 - Academic Integrity
 - Resources on Avoiding Cheating and Plagiarism
- Copyrighted Materials
- Netiquette and Communication
- Adding or Dropping a Course
- Academic Calendar
- Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships
- Sexual Assault Reporting Policy

Students with Disabilities

Students needing special accommodations should work with the University's [Center for Students with Disabilities \(CSD\)](#). You may contact CSD by calling (860) 486-2020 or by emailing csd@uconn.edu. If your request for accommodation is approved, CSD will send an accommodation letter directly to your instructor(s) so that special arrangements can be made. (Note: Student requests for accommodation must be filed each semester.)

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government." (Retrieved March 24, 2013 from [Blackboard's website](#))