CS 395-HBD1: Theoretical Computer Science
Department of Physical and Computer Science

COURSE SYLLABUS

Instructor:	Professor Reid	Term:	Fall 2025
Office:	Online/AB1-503K	Class Schedule:	Mon 5:30 PM - 7:10 PM
			Wed 5:30 PM - 7:10 PM
Phone:	TBA	Class Location:	AB1-C09
Email:	jermainereid@mec.science	Lab Location:	Advance Computing Lab
Website:	TBA	Office Hours:	Wed 12:30 PM - 4:30 PM

I. Welcome!

Welcome to Theoretical Computer Science.

II. University Course Catalog Description

This course focuses on fundamental issues of Computer Science Theory, Automata and formal language theory, and the theory of computational complexity. Topics include formal languages, finite state automata, pushdown automata, Turing machines, and the languages they recognize.

III. General Education Requirement Fulfillments

☐ Foundation Cluster

☐ General Knowlege Cluster

☐ Required Core

☐ Flexible Core

College Option:

☐ Socio-Cultural & Diversity Cluster

☐ Social Science Cluster

☐ Humanities & the Arts Cluster

☐ Natural Sciences & Mathematics Cluster

IV. Course Overview

This course discusses the relationship between automata and formal languages as well as introduces rudimentary knowledge of compiler construction, performs program testing, and measures program running times.

V. Course Objectives / Student Learning Outcomes (SLOs)

By the end of this course, students will be able to:

- Demonstrate knowledge of the theory of formal languages and automata, including:
  - Families of formal languages (regular, context-free, context-sensitive, recursively enumerable)
  - Families of phrase-structure grammars (regular, context-free, context-sensitive, unrestricted)
  - Families of abstract machines (finite state automata, pushdown automata, linear bounded automata, Turing machines)
- Recognize Turing machines as a model of computation.
- Formulate solutions to problems using the Turing machine model.
- Understand and explain the role of the Turing machine in theories of decidability and computability.

VI. Course Prerequisites

CS 241: Discrete Structures; CS 246: Data Structures

VII. Course Credits

3 credits; 4 class hours.

VIII. Required Texts and Materials

Introduction to the Theory of Computation, 3^{rd} Edition, Michael Sipser

ISBN-13: 978-1-133-18779-0

IX. Supplementary (Optional) Texts and Materials

To be announced on Brightspace, by email, and in class.

X. Grading

The final grade will be determined based on a collection of assessments as follows:

Assessment	Percentage
Exams	60 %
Labs/Classwork	25 %
Projects	10 %
Homework	5 %
Total	100 %

The final grade will be a letter based on the following table:

Grading Scale (%)	
$97 - 100$	A+
$93 - 96.9$	A
$90 - 92.9$	A−
$87 - 89.9$	B+
$83 - 86.9$	B
$80 - 82.9$	B−
$77 - 79.9$	C+
$73 - 76.9$	C
$70 - 72.9$	C-
$60 - 69.9$	D
$0 - 59.9$	F

Additional criteria may affect your grade.

XI. Grade Dissemination

Grades for all assessments will be published in Brightspace and sent by email.

XII. Course Policies: Grades

Late Work Policy: There are no make-ups for missed assessments. Late submissions will be penalized.

Extra Credit: Extra credit will be provided. Details on extra credit will be provided in a supplementary document.

Incompletes: An Incomplete (INC) grade may be issued at the instructor's discretion when a student is performing at a passing level throughout the semester but, due to a valid reason, is unable to complete a major assessment. Issuing an INC requires an official contract signed by the student and the instructor. For additional information regarding INC grades, please refer to the College catalog.

Revision Policy: There are no revisions allowed unless otherwise specified.

XIII. Course Policies: Technology and Media

Computers and other electronic devices can only be used to access lecture materials. Students are not to work on other materials in class.

Students must check their email and Brightspace regularly for class information and announcements.

XIV. Student Expectations

Attendance Policy: All students are responsible for attending classes regularly on time, and fully participating in coursework. They are responsible for learning the material covered on the days they missed. The instructor is not obligated to reteach material under any circumstance. Assigned readings, problems, and programs should be completed before class.

Disability Access Medgar Evers College and its Office of Disability Services (ODS) are committed to ensuring that individuals with disabilities receive reasonable accommodations under the guidelines of the Americans with Disabilities Act. Any student who requires accommodations due to a documented disability should notify the ODS department.

Academic Integrity CUNY prohibits academic dishonesty and promotes penalizing such actions with academic sanctions. Academic Dishonesty as stated by CUNY, is:

1. **Cheating** - the unauthorized use or attempted use of material, information, notes, study aids, devices, artificial intelligence (AI) systems, or communication during an academic exercise.
2. **Plagiarism** - the act of presenting ideas, research, or writing that is not your own as your own.
3. **Obtaining Unfair Advantage** - any action taken by a student that gives that student an unfair advantage in his/her academic work over another student, or an action taken by a student through which a student attempts to gain an unfair advantage in his or her academic work over another student.
4. **Falsification of Records and Official Documents**

A more detailed description can be found on the MEC website under the CUNY Policies section of the Office of Academic Affairs menu. The academic sanctions for academic dishonesty are provided in a supplementary document.

XV. Important Dates

Check the official academic calendar from the Office of the Registrar for special dates such as the last day to add/drop classes, withdrawal deadline, closings, breaks, and examinations. Furthermore, at the discretion of the professor, exam dates can be changed.

XVI. Schedule

The schedule, together with assignments, is subject to change in the progress of the course. Announcements made in the class and on the website/Brightspace/email override the schedule in case of conflicts.

Topic	Section
Review of Mathematical Notations	Chapter 0
Regular Languages	Chapter 1
Context-Free Languages	Chapter 2
Church-Turing Thesis	Chapter 3
Decidability	Chapter 4
Time Complexity	Chapter 7
Space Complexity	Chapter 8