CS4510 - Spring 2026
Automata and Complexity

When & Where:
Lectures: TBD
Lecture Hall: TBD
All course materials shall be made available via CANVAS or course website.
Schedule on course website: `https://faculty.cc.gatech.edu/~ladha/S25/4510/`.

Instructor:
Professor Vijay Ganesh.
Webpage: `https://vganesh1.github.io/`
Email: vganesh@gatech.edu
Office hours: Thu 1-2 PM ET. MS Teams link.
I am super responsive via email and Ed Discussion.

Course Materials:
Slides developed by Prof. Costa Busch, Vijay Ganesh,...
Notes by Prof. Abrahim Ladha
Michael Sipser's book titled **Introduction to the Theory of Computation** 3rd Ed.

Topics Covered:
Foundations of computation:
Models of computation, limits of computation, easy vs. hard problems
Formal language theory and automata (approx. 8 lectures):
Regular languages, NFA, DFA,...context-free languages, push-down automata,...
Computability theory and logic (approx. 10 lectures):
Turing machines, undecidability, PCP, diagonalization
Intro to first-order logic, Cantor, Russell, and Godel's theorems
Structural complexity (approx. 8 lectures):
Complexity classes P, NP...Reductions, Polynomial hierarchy, Savitch's theorem,...

Marking:
Assignments (40%): 4 assignments, Each worth 10% of total marks
Latex template: If all assignments done using Latex template, extra 1%
Exams (60%): one mid-term (15% each); one final exam (45%).
A:90+, B:80-89, C:70-79, D:60-69, F: less than 60.

Late Submission:
No late submissions accepted, unless authorized by instructor.

Miscellaneous:
Homeworks released on Wednesdays, due in one week
All assignment submissions via Gradescope, unless specified otherwise.
Assignments must be done individually.
Term exams will be held in class.
Final exam after the last lecture.
No pass/fail. No audit.

Honor System: `https://policylibrary.gatech.edu/student-life/academic-honor-code`
Misconduct: `https://osi.gatech.edu/process/academic-misconduct-process`