Course Syllabus CS 301 Theory of Computation Spring 2024

Instructor

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Meeting Times

Monday, Wednesday, and Friday at 1:10 - 2:00 PM in Glatfelter Hall 201.

Office Hours

Mondays and Thursdays at 3:05 - 3:55 PM Wednesdays and Fridays at 9:00 - 10:30 AM

Course Description

Study of the basic theoretical principles of the computational model. Topics include finite automata, regular expressions, context-free grammars, Turing Machines, Church's Thesis, P and NP classes, the halting problem, unsolvability, computational complexity, and program verification. Prerequisite: Math 208 or 215 or CS 201 with a C- or better.

Materials

Text: Introduction to the Theory of Computation (3rd ed.), by Michael Sipser.

A copy of the textbook will be available for you to borrow during the entire semester. You are expected to read and work through all relevant material in the sections we cover in class in addition to completing your homework and attending lectures.

Assessment

Homework Assigned after every class meeting, you are expected to complete your homework assignment(s) by class Wednesday of the next week. *Homework will not be collected or graded, but problems strongly inspired by these exercises will appear on weekly quizzes.* Solutions to selected problems will be available in the text to aid your study.

Quizzes This will be the main category of assessment and should be viewed as a way of *"handing in your homework"*. One-page 20-minute quizzes will be given weekly in class on Wednesdays and will be based on materials from the previous week. *You will see a strong relationship between assigned/in-class exercises and quiz problems.* Two lowest dropped.

4th Hour	This course should be the equivalent of three hours and twenty minutes in class, along with the associated time outside of the classroom: homework, study, etc. Since the course meets approximately three hours per week, the schedule will contain an additional fourth hour item each week. *You will be required to complete and submit a subset of problems closely related to missed quiz problems each week.* This will count in two ways: You will receive credit in the fourth hour assessment category, and you will "earn back" at most one-third of the points you missed on that quiz. Handed out with graded quizzes on Friday; due the following Monday at the beginning of class.
Final Exam	Cumulative exam given at the end of the semester which is scheduled by the College. This may not be rescheduled.
Attendance	Attendance will be taken at the start of most lectures. You are permitted two unexcused absences – including tardiness – during the semester and each subsequent recorded unexcused absence will result in a 1% deduction to your overall course grade, up to 10%. You are *always* responsible for missed content.

Grading Scheme

4th Hour 10%	**Quizzes** 55%	[X7%, Y0%) receives a + letter grade.[1]
		[X3%, X7%) receives standard letter grade.
Final Exam 25%	**Attendance** 10%	[X0%, X3%) receives a - letter grade.

Honor Code

All Gettysburg College students are expected to abide by the Honor Code. You are encouraged to discuss -- at a *macroscopic* level -- course materials and assignments with your fellow classmates, but all submitted work -- and its *microscopic* detail -- must be a product of yours alone. The department is aggressive with enforcement of the Honor Code.

Statement on Diversity

It is understood that every student has their own unique background with respect to their academic path, socioeconomic status, gender, race, and belief system(s). Let it be stated in the clearest terms possible: *you belong here and you are welcome here*. We will foster an uplifting environment where all participants can succeed through focused effort on course materials. We will lead by example that any human can participate in and meaningfully contribute to the sciences.

[1] The usual ranges apply. I.e. 90's are A's, 80's are B's, etc. +/- are not used in the D and F ranges. You must *complete and pass* all assignments to earn the grade of A+.

Generative AI Policy

Students in this course are ***strongly discouraged*** from using generative AI to complete or help complete assignments, including (but not limited to) using large language models such as ChatGPT. It is the purpose of this course for you to learn the theory of computation from first principles, and the use of generative AI could trivialize many facets of this intended experience.

If you choose to not heed the instructor's ***strong discouragement*** on this matter, you must do the following.

Submit a written report in PDF format together with each assignment that you use any form of generative AI to complete; submit this report directly to your instructor through e-mail. It must detail how generative AI was used and, importantly, why you felt that your use of generative AI on that assignment resulted in a better comprehensive understanding of the materials for you.

The above report(s) will influence your final course grade in a way that is commensurate with the validity and sincerity of their arguments, as determined by the instructor at the end of the semester. It is very possible that this negatively impacts your grade.

Any instance of submitting AI-assisted materials without proper documentation will be considered an honor code violation. Each violation will be submitted to the College and will be aggressively pursued.

Colloquium Policy

The computer science department will host at least 3 colloquia this semester during the usual time slot. Stay vigilant regarding announcements which you should receive via e-mail from the department. *You are required to attend at least one this semester; failure to do so will result in a -5% penalty to your overall course grade.* You may, of course, attend as many as you'd like. Each attendance beyond your first will result in a +1% bonus to your course grade, up to a maximum of +3%.