

SYLLABUS

Instructor: Dr. Charles E. Hughes
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Class: TR 1:30pm – 2:45pm

Office Hours: TR 3:15pm – 4:45pm

GTA hours: MW 4:00pm – 6:00pm (Yiu Yu (“Raymond”) Ho, 308 HEC)

Texts: Course notes (<http://www.cs.ucf.edu/courses/cot4210/Fall2009/Notes/COT4210Notes.pdf>)

Web site: <http://www.cs.ucf.edu/courses/cot4210/Fall2009/COT4210Fall2009.html>

Sipser, *Introduction to the Theory of Computation 2nd Ed.*, Course Technologies, 2005

Rules to Abide by

- Do Your Own Work
 - When you turn in an assignment, you are implicitly telling me that these are the fruits of your labor. Do not copy anyone else's homework or let anyone else copy yours. In contrast, working together to understand lecture material and solutions to problems not posed as assignments is encouraged. Cheating on an assignment will result in an F on that assignment for the first infraction and an F for the course on the second. This can also lead to administrative action at the university level.
- Late Assignments
 - I will accept no late assignments, except under very unusual conditions, and those exceptions must be arranged with me or the GTA in advance unless associated with some tragic event.
- Exams
 - No communication during exams, except with me or a designated proctor, will be tolerated. A single offense will lead to termination of your participation in the class, the assignment of a failing grade and probable administrative action at the university level.

Grading Policy:

- Mid Terms (2) – 100 points each
- Final Exam – 150 points
- Assignments (10 or so) – 100 points
- Bonus – best exam weighed +50 points
- Total Available: 500
- Grading will be A \geq 90%, B+ \geq 87%, B \geq 80%, C+ \geq 77%, C \geq 70%, D \geq 50%, F < 50%

Attendance: I do not take attendance but I expect it, and I expect you to arrive on time. If people begin arriving late or missing class as a matter of habit, I will begin having unannounced quizzes. If you have legitimate reasons for arriving late or leaving early, please inform me ahead of time, and please enter or leave the classroom as unobtrusively as reasonable.

Expected Outcomes

- You will gain an understanding of various types of automata and other computational models and their relation to formal languages.
- You will have a strong sense of the limits that are imposed by the very nature of computation, and the ubiquity of unsolvable problems throughout CS.
- You will understand the notion of computational complexity and especially of the classes of problems known as P, NP and NP-complete.
- You will come away with stronger formal proof skills and a better appreciation of the importance of discrete mathematics to all aspects of CS.

Brief Outline

Introduce Theory of Computation, including

- Various models of computation
 - Finite State Automata and their relation to regular expressions and regular grammars
 - Push Down Automata and their relation to context-free languages
 - Techniques for showing languages are NOT in particular language classes
 - Closure and non-closure problems
 - Decision procedures for solvable problems related to automata and languages
- Limits of computation
 - Turing Machines and other equivalent models
 - Undecidable problems
 - The technique of reducibility
 - The ubiquity of undecidability
- Complexity theory
 - Order notation (this should be a review)
 - Time complexity, the sets P and NP, and the question does P=NP?

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- Space complexity (time permitting; pun intended)