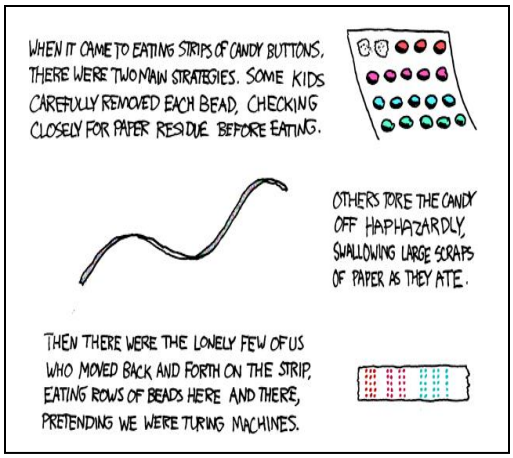
CSCI 3500 Applied Theory of Computing

Course Description
A study of the major theoretical topics needed for a well-rounded knowledge of computer science. These will include automata, formal languages, asymptotics, NP-completeness, formal verification, and the design of algorithms

Prerequisites: CSCI 3030 Mathematical Structures for Computer Science
CSCI 3400 Data Structures

Textbook: Introduction to Automata Theory, Languages, and Computation by Hopcroft, Motwani, Ullman
3rd Edition



Grading: Scores on the following determine your grade:

Test #1	25 %	
Test #2	25 %	
Final Exam	40 %	
Homework	10 %	No late homework accepted.

Course Grade Scale:				
	A	92 -	100	After each exam, I adjust
	B	84 -	92	the grading scale if
	C	74 -	84	necessary.
	D	64 -	74	
	F	0 -	63	

Attendance: You are strongly encouraged to attend class. I do not repeat lectures or provide notes. You are responsible for all class material whether or not you attend class. If you stop attending class, I have the right to withdraw you. However, withdrawing from the class is the responsibility of the student. Do not assume I will drop you from the class. If you stop attending after midterm, I will give you a WF.

Academic honesty is everyone's responsibility. Therefore, please familiarize yourself with the section on academic honesty in the GRU Student Manual and GRU Academic Policy. Academic dishonesty – cheating on exams, plagiarism of the work of others, unapproved collaboration on graded work, and the like – is not tolerated. Depending on the nature and severity of the problem, a student who is guilty of any such violation may be: 1) withdrawn from the course with a grade of WF (counted as an F in the GPA); 2) given a grade of zero on the assignment; 3) given a grade of F in the course; or 4) otherwise penalized, at the discretion of the faculty member.

Make-up Policy: No make-up exams are given. If, due to extraordinary circumstances, a student misses a class when an exam is scheduled, the instructor must be notified at least a week in advance unless it is some type of emergency. A student may be required to submit documentation. If the absence is an excusable absence, the weight of the missed exam is placed onto the final exam's weight.

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Office Hours: See Web page

Preliminary Course Schedule*

Week	Book	Topics
1	1 to 1.1	Introduction Computability, Complexity and Automata Review Sets
2	1.5 2.1	Strings and Languages Alphabets Strings over an alphabet Languages and Common Operations Finite Automata Theory
3	2.2 2.2.2	Deterministic Finite Automata (DFA) DFA and Strings Formal Definition Processing an input string
4	2.2.4	Extended Transition Function Distinguishable and Indistinguishable States DFA Applications
5	2.3 2.3.5	Non-Deterministic Finite Automata (NFA) Formal Definition Equivalence of DFA and NFAs
6	2.5	λ Transitions and eliminating λ Transitions
		Exam 1
7	 3.1 3.2.2	**Return Exam 1** Regular Expressions Definition Simplification
8	3.2 3.3	From Regular Expressions to FA's From FA's to Regular Expressions Regular Expression Applications
9	4.1.1 4.2 5 5.1.1	Properties of Regular Expressions Pumping Lemma Context-Free Grammars Formal Definition
10	5.1.3 5.2, 5.4	Derivations Parse Trees, Ambiguous Grammars
11	5.3 6.1 6.1.2	Applications PDA Formal Definition Processing an input string
12	6.2	Accepting State vs. Empty Stack
13		**TEST 2**
14	6.3 8.2.2	PDA ↔ CFG Turing Machine Formal Definition
15		
		Final Exam

*Subject to change (including, but not limited to, the fact that this * might change)