

# CS 4313 Syllabus – Spring 2003

## Automata, Computability, and Formal Languages

Discussion of abstract machines (finite state automata, pushdown automata, and Turing machines), formal languages (regular, context-free, and type 0), and the relationship among them. 3 hours credit. Prerequisites: CS 3343.

### Instructor

Name: Tom Bylander  
Office: SB 3.02.05B  
Phone: 458-5693  
Email: bylander@cs.utsa.edu  
Office Hours: Monday 9-10am, Wednesday 10-11am, Friday 11am-12, or by appointment.

### Book

Required: P. Linz, *An Introduction to Formal Languages and Automata*, 3rd Edition, Jones and Bartlett, 2001.

### Grading

Homework	40%
Midterm	20%
Final (comprehensive)	40%

### Homeworks

There will be several homeworks. Generally, homework will be assigned on Wednesday during class, be due on the following Wednesday, and returned at the next class session. This gives us one day to discuss any questions on the assignment. Two homeworks will be omitted from your final grade. Late homeworks incur a 10% penalty.

### Attendance and Participation

Regular class attendance per se is not required, but note homework policy above. Make-up exams are permitted as long as it's a reasonable excuse, you inform me in a timely fashion, and you document the excuse.

## Tentative Schedule

<u>Day</u>	<u>Topic</u>	<u>Reading</u>
Jan. 13	Languages, Grammars, and Automata	§1.1-2
15	DFA's	§2.1
22	NDFAs	§2.2
27	Equivalence of DFA's and NDFAs	§2.3
29	Regular Expressions	§3.1-2
Feb. 3	Regular Grammars	§3.3
5	Closures and Algorithms	§4.1-2
10	Pumping Lemma	§4.3
12	CFGs	§5.1,3
17	Parsing, Ambiguity, and CYK Algorithm	§5.2, 6.3
19	Pushdown Automata	§7.1
24	= CFGs	§7.2
26	Pumping Lemma for CFGs	§8.1
Mar. 3	Midterm Review	
5	<b>Midterm</b>	
10	Midterm Results	
12	Turing Machines	§9.1
24	Combining Turing Machines	§9.2
26	Turing's Thesis	§9.3
31	Nondeterministic Turing Machines	§10.3
Apr. 2	Universal Turing Machines	§10.4
7	Recursively Enumerable Languages	§11.1
9	More Grammars and the Chomsky Hierarchy	§11.2-4
14	Undecidable Problems	§12.1
16	More Undecidable Problems	§12.2-4
21	Complexity Theory	§14.1-2
23	Complexity Classes	§14.3
28	P and NP	§14.4
30	Final Review	
May 8	<b>Final Exam: 1:30am to 4:15pm</b>	