Course Syllabus

Course Information

Course Number/Section	CS 4384 002
Course Title	Automata Theory
Term	Fall 2021
Meetings	TR 11:30am-12:45pm in ECSS 2.415

Professor Contact Information

Professor	Dr. William J. Pervin
Office Phone	972-883-2719 (e-mail preferred)
Email Address	pervin@utdallas.edu
Office Location	ECSN 4.626
Online Office Hours	TR 10:45am-11:15am and many other times by appointment
Other Information	I do not read eLearning mail but use it to give information. Send messages to my email address with <CS 4384> as Subject.

Course Pre-requisites, Co-requisites, and/or Other Restrictions
CS 3305 with grade of C or better.

Course Description
Deterministic and nondeterministic finite automata; regular expressions, regular sets, context-free grammars, pushdown automata, context free languages. Selected topics from Turing Machines and undecidability.

Student Learning Objectives/Outcomes
Students will have the ability to: (1) Design and convert between DFA, NDFA, and regular expressions; (2) Show that certain languages are not regular; (3) Design and convert between PDAs and CFGs; (4) Show that certain languages are not context free; (5) Design and analyze Turing Machines; (6) Prove and apply the Halting Problem to other problems of undecidability

Required Textbooks and Materials (FREE)

Required Texts
"Automata, Computability and Complexity" by Elaine Rich (Free Download)
http://cs.utexas.edu/~ear/cs341/automatabook/
"Theory of Computation" by Anil Maheshwari & Michiel Smid (Free Download)
http://cglab.ca/~michiel/TheoryOfComputation/TheoryOfComputation.pdf
"Automata and Formal Languages" by Jarkko Kari of University of Turku (Free Download)
http://users.utu.fi/jkari/automata/fullnotes.pdf

Required Materials
JFLAP computer program and tutorial (Free Download) *JFLAP*

Suggested Course Materials
Notes will be posted on the web page for this course. Many other ***free*** resources such as MiXTeX/TeXworks and the Texmaker LaTeX system will be available through eLearning. Note: Other sections may require the excellent book by Sipser ($278.50) as text but this section does not.

Technical Requirements
In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements on the Getting Started with eLearning webpage.

Course Access and Navigation
This course can be accessed using your UT Dallas NetID account on the eLearning website.

Please see the course access and navigation section of the Getting Started with eLearning webpage for more information.

To become familiar with the eLearning tool, please see the Student eLearning Tutorials webpage.

UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The eLearning Support Center includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

Communication
This course utilizes online tools for interaction and communication. Some external communication tools such as regular email and a web conferencing tool may also be used during the semester. For more details, please visit the Student eLearning Tutorials webpage for video demonstrations on eLearning tools.

Student emails and discussion board messages will be answered within 3 working days under normal circumstances.

Distance Learning Student Resources
Online students have access to resources including the McDermott Library, Academic Advising, The Office of Student Accessibility, and many others. Please see the eLearning Current Students webpage for more information.

Server Unavailability or Other Technical Difficulties
The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty that prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and also contact the online eLearning Help Desk. The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

Grading (credit) Criteria	**On each examination or quiz, each question grades will be awarded subjectively but as uniformly as possible. The final score will then be analyzed subjectively but based on previous experience and equated to a letter grade. The letter grades for the examinations will then be calculated and a final grade assigned by strict calculation assigning numerical values to the letter grades. *Homework* will count and is essential if one wishes to pass this course. Students should try even more than any suggested problems. If you have any questions about the answers, visit either the Professor or the Teaching Assistant.**
Make-up Exams	**None given unless excellent verified medical excuse**
Extra Credit	**None**
Late Work	**Not accepted without excellent verified medical excuse**
Special Assignments	**None**
Class Attendance	**Expected**
Classroom Citizenship	**Appropriate**
Comet Creed	*The UT Dallas student body voted on this creed in 2014. It is a standard that Comets choose to live by and encourage others to do the same:* ***"As a Comet, I pledge honesty, integrity, and service in all that I do."*** ***This includes finding the answers to homework or examination questions on-line!***

Academic Calendar (Tentative)

L01	T 08/24		Introduction; Review CS 3305	
L02	R 08/26		**Finite Automata**	5.1,5.3
L03	T 08/31		Non-determinism	5.4
L04	R 09/02		Regular Languages; Quiz 1	6.1
L05	T 09/07	*	Regular Expressions	6.2,6.3,6.4
L06	R 09/09		Pumping Lemma for RLs	8.4
L07	T 09/14		Pumping Lemma for RLs	8.4
L08	R 09/16	*	Minimization; Quiz 2	5.7
L09	T 09/21		Review	
	R 09/23		>Examination 1	
L10	T 09/28		**Push-Down Automata**	12.1,12.2
L11	R 09/30		Push-Down Automata	12.1,12.2
L12	T 10/05		Context-Free Grammars	11.2,11.3
L13	R 10/07		Chomsky Normal Form; Quiz 3	11.8
L14	T 10/12		Chomsky Normal Form	11.8
L15	R 10/14		Pumping Lemma for CFLs	13.3
L16	T 10/19		Pumping Lemma for CFLs	13.3
	R 10/21		>Examination 2	
L17	T 10/26		**Turing Machines**	17.1,17.2
L18	R 10/28		Type-0 Languages	23.1,23.2
L19	T 11/02		Decidable & Semi-Decidable	20.1,20.2
L20	R 11/04		Decidable & Semi-Decidable	20.1,20.2
L21	T 11/09		Decidability; Quiz 4	21.1,21.2
L22	R 11/11		Halting Problem	19.1
L23	T 11/16		Halting Problem	19.2
L24	R 11/18		Reducability	21.5,21.6
L25	T 11/30		Reducability	21.7
	R 12/02		>Examination 3	
L26	T 12/07		Review	
		* May be on-line recordings		

UT Dallas Syllabus Policies and Procedures
The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to UT Dallas Syllabus Policies webpage for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.