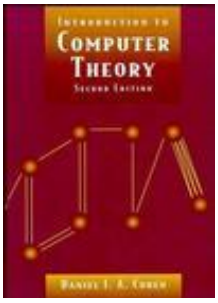
Texas A&M University - Commerce

Course Syllabus[#]



CSCI549

AUTOMATA THEORY

May Mini, 2023

Department of Computer Science
College of Sciences and Engineering

 # Course syllabus is tentative and subject to change at any time during the semester. Any changes will be announced in class.

Instructor: Dr. Sang C. Suh, Regents Professor, Department of Computer Science
Texas A&M University - Commerce
[Office: Jour223 Phone: 903.468.8199 E-mail: sang.suh@tamuc.edu
- Email communication is strongly encouraged as an effective way for communication.

Class Meetings: Online class - **CSCI 549-02W – Hours: 3**
Meets 5/15/2023 through 6/1/2023

Textbook:
Introduction to Computer Theory by Daniel I. A. Cohen
John Wiley & Sons, Inc., 1997, 2nd Ed. ISBN 0-471-13772-3

Tentative Schedule:
PART I: Chapters 1,2,3,4,5,6,7,8,9,10 and 11
PART II: Chapters 12,13,14,15,16 and 17
PART III: Chapters 19 and 20

Course Objectives:
This course is one of the five core courses for M.S. degree in Computer Science at Texas A&M University - Commerce. The primary goal of this course is to provide fundamental introduction to the design of programming languages (PL). Both the theoretical foundations of PL and its practical aspect will be studied by covering chapters 1 through 20. The fundamental topics to be covered in this course include regular expressions, finite automata, (non-)regular languages, context-free grammars, regular grammars, Chomsky normal forms, pushdown automata, (non-)context-free languages, parsing and Turing machines. These fundamentals are essential prerequisite for those who may pursue more advanced topics and applications of Computer Science. Since the ultimate goal of automata theory is the construction of efficient program languages, no study of automata is complete without some experience designing grammars. For this purpose, a medium-scale program language design project will be assigned as a class project. The design project is an essential part of the successful course completion. The grading will be based on the following criteria:

STUDENT LEARNING OUTCOMES (SLO):
1. Understand the concept of formal languages through such mechanism as regular expression, recursive definitions, finite automata, transition graph, Mealy machine and Moore machine.
2. Apply Kleene's theorem and pumping lemma for the design and management of regular and non-regular languages.

3. Construct context free, regular, Chomsky normal form grammars to design computer languages
4. Design and construct a pushdown automata and a Turing machine for a computer language
5. Design and implement the LR(1) parser for a computer language

Students with Disabilities Act Compliance:

Students requesting accommodations for disabilities must go through the Academic Support Committee. For more information, please contact the Director of Disability Resources & Services, Halladay Student Services Bldg., Room 303D, (903) 886-5835

Academic Ethics and Honesty Statement:

Scholastic dishonesty is a violation of the Code of Student Conduct. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion. "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedures, Conduct).

Academic dishonesty includes, but is not limited to, cheating on tests, plagiarism and collusion. ***Cheating*** includes copying from another student's test or homework assignments or projects or quizzes, using materials not authorized, collaborating with or seeking aid from another student during a test, knowingly using, buying, selling, stealing, or soliciting the contents of an unadministered test, and substituting for another person to take a test. ***Plagiarism*** is the appropriating, buying, receiving as a gift, or obtaining by any means another's work and the unacknowledged submission or incorporation of it in one's own written work. ***Collusion*** is the unauthorized collaboration with another person in preparing written work for fulfillment of course requirements. Academic dishonesty is a serious offense in college. You will be given not only a failing grade on the assignment or test, but also a failing grade for the class. Further, it will result in suspension from college.

Plagiarism:

In any written paper or test or assignment or quiz or project including code and document, you are guilty of the academic offense known as plagiarism if you half-copy or copy the author's sentences, words or any part of the content. **This will result in an automatic grade of "F" for the course.** Hence any of these must be fully avoided in order not to fail from the class. Students copying from work done in previous semesters by former students as well as copying from internet sources without proper reference will result in the failure of the course. You cannot mix the author's words with your own or "plug" your synonyms into the author's sentence structure. To prevent unintentional borrowing, resist the temptation to look at the source as you write. The author's words, phrases, sentences must be put in your words, in your way of writing! When you do this, you are demonstrating the ability of understanding and comprehension!

Course Requirement Deadlines:

Credit will be given for ONLY those exam(s), program(s), and/or project(s) turned in no later than the deadline(s) as announced by the instructor of this class unless prior arrangement has been made with the instructor.

Course Requirement:

- Scanning and uploading of handwritten paper will be necessary
- Recording and posting of the presentation on YouTube will be necessary.
- Exam proctoring service may be required where the students are.

Method of Evaluation (*Tentative*):

Tests (4 Exams – 15% each) (40%)
Tests (Final) (60%)

Course Grade System:

- 100 – 90 - A
- 89 – 80 - B
- 79 – 70 - C
- 69 – 60 - D
- Below 60 - F

Tentative Course Outline (subject to change):

UNITS	WEEKS	SUBJECTS TO BE COVRED
1	1 (5/15) M	Course Introduction Chapters 2 & 3 (language & RD) Chapter 4 (regular expressions) Chapter 5 (finite automata)
2	2 (5/17) W	Exam 1
3	3 (5/18) R	Chapters 6 & 7 (TG & Kleene's theorem) Chapters 8 & 9 (Mealy & Moore machines)
4	4 (5/19) F	Exam 2
5	5 (5/22) M	Chapters 10 & 12 (NRL & CFG) Chapters 13 (CNFG), CKY Parsing
6	6 (5/24) W	Exam 3
7	7 (5/25) R	Chapters 14 (PDA) Chapters 17 & 19 (CFL & TM)
8	8 (5/26) F	Exam 4
9	9 (5/29) M	Review for final exam
10	10 (5/30) T	Final Exam