

COSC 3340/6309: Introduction to Automata and Computability

Spring 2011

Instructors: Rong Zheng (rzheng (at) cs.uh.edu)
TA: Apurva Gala (avbedagk at mail.uh.edu, PGH550E); Nasim Hajari (n.hajary at gmail.com, PGH220)
Lectures MW 1:00pm – 2:30 pm in PGH 232
Office Hours: M 2:30pm-6:30pm (Zheng) TW 11:00am – 1pm (Gala) Thur 10am – 2pm (Nasim)
Class web site: Go to www.uh.edu/webct, click on WebCTVista button

Textbook:

- Introduction to the Theory of Computation by M. Sipser, 2nd ed. Thomson Course Tech.

References:

- John E. Hopcroft, Rajeev Motwani, and Jeffrey D. Ullman, Introduction to Automata Theory, Languages, and Computation, Addison Wesley; 3 edition (July 15, 2006)

Prerequisites: Math 3336 and COSC 2320. Math 3336 will be strictly enforced.

Synopsis:

To provide computer science students with a broad understanding of various models of computation, several different characterizations of the power of each model, and the relative power of the models. Students are taught what can and what cannot be computed even by idealized computing devices. They are exposed to essential computational paradigms in a rigorous way.

Topics:

- Finite Automata and Regular languages
- Pushdown Automata and Context-free languages
- Turing Machines
- Church's thesis, Grammars, Universal Turing Machines
- The Halting Problem, Turing-Acceptability, Turing Decidability, and Unsolvable problems about Turing machines
- Cardinality of sets, Proof techniques, and basic definitions

Tentative schedule:

Lectures	Topic	Reading, Assignments
1 st week	Introduction	Chapt 0
2 nd to 5th weeks	DFA, NFA, Regular expression	Chapt 1, Exam 1
6 th – 8 th weeks	CFL and pushdown automata	Chapt 2, Exam 2
9 th week	Spring break	TBA
10 th - 12 th weeks	Turing machine and decidability	Chapt 3 – 5 Exam 3
13 th – 14 th weeks	Computational tractability	Chapt 7
15 th week	Review, Exam 4	TBA

Grading

There will be four home work sets (10%, 10%, 10%, 10%) and four exams (15, 15, 15%, 15% of grade), sample questions. All tests will be **closed book**.

No cheating will be tolerated on any graded assignment: **what you turn in must be your own work**. The minimum penalty for any transgression will be an **F grade** for the course. **People failing the assignments OR the exams will fail the course.**