COSC 3340/6309: Introduction to Automata and Computability
Fall 2012

Instructors: Rong Zheng (rzheng (at) cs.uh.edu)
TA: Charu Hans (charuhans85@gmail.com) and Christopher DeVito (cedevito@cs.uh.edu)
Lectures   MW 1:00pm – 2:30 pm in PGH 232
Office Hours: TBD
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
1st week	Introduction	Chapt 0
2nd to 5th weeks	DFA, NFA, Regular expression	Chapt 1, Exam 1
6th – 8th weeks	CFL and pushdown automata	Chapt 2, Exam 2
9th week	Spring break	TBA
10th - 12th weeks	Turing machine and decidability	Chapt 3 – 5 Exam 3
13th – 14th weeks	Computational tractability	Chapt 7
15th 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.**