**COSC 6369 Theory of Computation**

**Prerequisites:** COSC 3340 or consent of instructor.
**Textbook**

- Computability, Complexity and Languages, M. Davis, R. Sigal and E. Weuyker, 2nd edition, Morgan Kaufmann, 1994.

**References**

- Elements of the Theory of Computation by H. Lewis and C. Papadimitriou, Prentice Hall, first and second editions.
- Introduction to Automata Theory, Languages and Computation by J. Hopcroft, R. Motwani and J. Ullman, Addison-Wesley, 2001.
- Introduction to the Theory of Computation by M. Sipser, 2nd edition, Course Technology, Feb. 2005.

**Goals**

- 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.
- Special topics on logic and complexity as time permits

**Instructor:**
Rakesh Verma.
Office 532 PGH, Ph: 743-3348.
Office Hours for Fall 2011: Tu.Th. 1.10-1.40pm (or by appt.)

**Academic Honesty Policy: Assistance of or Collaboration with any animate or inanimate object (except the instructor and the TAs) is completely disallowed on all exams; any violation will be severely penalized with the minimum penalty on FIRST violation being an F grade.**

**Grading:** (**All weights are approximate and subject to change**) Class participation 2%, Homeworks 4%, Quiz 1 9%, Quiz 2 13%, Quiz 3 17%, Quiz 4 20% and Final 35%
**Tips for Success:**

- Study the material ahead of class and prepare questions for class if you do not understand something.
- Do as many exercises as you can. Do not wait for homeworks to be assigned.
- Start early on any homeworks. Get doubts clarified during office hours, make appt. if necessary.
- Participate during class: ask questions, contribute answers, vote, ...

**Cellphone/Pagers/Beepers policy:** First violation during regular class period, cellphone will need to be turned in until end of class. Second violation, cellphone will need to be turned in for two days. Third violation, cellphone will need to be turned in for the semester. First violation during quiz or exam, 50% deduction of credit. Subsequent violations will earn a 0 for the quiz or exam.