COMP 409
Logic in Computer Science

Spring 2011
http://www.cs.rice.edu/~vardi/comp409/

Background

Logic has been called "the calculus of computer science". The argument is that logic plays a fundamental role in computer science, similar to that played by calculus in the physical sciences and traditional engineering disciplines. Indeed, logic plays an important role in areas of Computer Science as disparate as architecture (logic gates), software engineering (specification and verification), programming languages (semantics, logic programming), databases (relational algebra and SQL), artificial intelligence (automatic theorem proving), algorithms (complexity and expressiveness), and theory of computation (general notions of computability).

COMP 409 provides the student with a thorough introduction to mathematical logic, covering in depth the topics of syntax, semantics, decision procedures, formal systems, and definability for both propositional and first-order logic. The goal is to prepare the students for using logic as a formal tool in computer science.

Basic Information

Instructor:	Moshe Y. Vardi
	Duncan Hall 3057 (ext. 5977), vardi@cs.rice.edu
	Office Hours: by request
TA:	Seth Fogarty
	Duncan Hall 3060, sfogarty@gmail.com
	Office Hours: Tu: 2:30am - 4:00pm, Th: 2:30pm - 4:00pm
Textbook:	Schöning: *Logic for Computer Scientists*, Birkhauser, 2008
	(not all material that will be covered in the class is in the book).
Prerequisites:	COMP 280 or instructor's permision

Recommended Reading

M. Gardner: *Logic Machines and Diagrams*, 1982
A. Feferman: *Politics, Logic, and Love: the life of Jean Van Heijenoort*, 1993
M. Davis: *Engines of Logic*, 2001.

Grading

There will be two take-home, open-book tests: a mid-term test and a final test, as well as periodical problem sets, and a programming project. Each test accounts for 35% of the final grade, the problem sets account for 20% of the final grade, and the programming project accounts for 10% of the final grade. Classroom participation will be used to determine boundary cases. All problem sets will be assigned to pairs of students; you will learn more that way. Effort counts more than success on the problem sets. Without, however, doing the problem sets diligently, you have little chance of doing well on the tests.

Special Accomodations

Any student with a disability requiring accomodations in this class is encouraged to contact me after class or during office hours. Alternatively, students could contact the Coordinator for Disabled Student Services in the RMC Cloisters.