CSC 438/2404 – Fall 2007
Computability and Logic

Prerequisite: CSC364, or math sophistication and some knowledge of CS and predicate calculus
Exclusion: MAT309H, PHL344H
Lectures: Friday 9-11 in LM 155
Tutorial: Monday 10-11, LM 155
Instructor: Toniann Pitassi, SF 2305A, 978-3695, toni@cs.toronto.edu
Office hours: Friday 11-12
Tutors: Phuong Nguyen (pnguyen@cs)
Web Page: http://www.cs.toronto.edu/ toni/Courses/438-2007/CS438.html

Text: None

Course Notes: Postscript files for course notes and all course handouts will be available on the web page.

Topics:

Syntax and semantics of the propositional and predicate calculus, completeness of Gentzen proof systems, formal theories, nonstandard models, and the Godel Incompleteness Theorems. Recursive and primitive recursive functions, Church's thesis, unsolvable problems, recursively enumerable sets.

Marking Scheme:

3 assignments (1/9 Each), 3 term tests (2/9 each).
Assignments due at the beginning of class on the following dates: Oct 5, Nov 5, Dec 3
Term tests: Oct 12 and Nov 12. The third test will be during the last lecture, on December 7.

References:

S Buss: Chapter I: An introduction to proof theory, in **Handbook of Proof Theory**, S Buss Ed., Elsevier, 1998, pp1-78. (grad)
J Bell and M Machover: **A Course in Mathematical Logic**. North-Holland, 1977. (grad)

H.B. Enderton, **A Mathematical Introduction to Logic** (undergrad)
G Boolos and R.C. Jeffrey, **Computability and Logic** (undergrad)
E. Mendelson, **Introduction to Mathematical Logic**, 3rd edition (undergrad/ grad)
J.N. Crossley and others, **What is Mathematical Logic?** (informal, readable)
A.J.Kfoury, R.Moll, and M. Arbib, **A Programming Approach to Computability** (undergrad)
M.Davis, R. Sigal, and E. Weyuker, **Computability, Complexity, and Languages: Fundamentals of Theoretical Computer Science** (undergrad/grad)