CSC 438/2404 – Winter 2002
Computability and Logic

Prerequisite: CSC364, or math sophistication and some knowledge of CS and predicate calculus
Exclusion: MAT309H, PHL344H
Lectures: Thursday 12-2 in GB 120 **Tutorial:** Tuesday 1-2 in GB 120
Instructor: Toniann Pitassi, SF 2305A, 978-3695, toni@cs.toronto.edu
Office hours: Thursday 11-12
Tutor: Josh Buresh-Oppenheim, bureshop@cs.toronto.edu
Web Page: http://www.cs.toronto.edu/ toni/Courses/438-2002/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 (16% Each), 3 term tests (16%, 16% and 20%).
Assignments due at the beginning of tutorial on the following dates: 5 Feb, 12 Mar, 2 Apr.
Term tests: 12 Feb and 19 Mar (in tutorial). The third test will be during the last lecture, on April 11.

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)