CSC 438/2404 – Fall 2011
Computability and Logic

Prerequisite: CSC364, or math sophistication and some knowledge of CS and predicate calculus
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 SF2305A, Tuesday 3-4 SF 4306D
Tutor: Lila Fontes, fontes@cs.toronto.edu
Web Page: http://www.cs.toronto.edu/ toni/Courses/438-2011/438.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:

4 assignments (each worth 10% of final grade)
1 term test (30% of final grade)
Final examination (30% of final grade)
Assignments due at the beginning of class on the following dates: Oct 3, Oct 24, Nov 14, Dec 2.
Note the first three assignments are due on Monday at the start of tutorial and the last assignment is due at the start of the last class on Friday.
The term test will be held in class on Friday October 28.
Final will be held during the final examination period.

Assignments are due at the *beginning* of class, since solutions will be discussed during the beginning of class/tutorial.

The work you submit must be your own. You may discuss problems with each other; however, you should prepare written solutions alone. Copying assignments is a serious academic offence and will be dealt with accordingly.

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)