CSC 438/2404 – Fall 2009
Computability and Logic

Prerequisite: CSC364, or math sophistication and some knowledge of CS and predicate calculus
Exclusion: MAT309H, PHL344H
Lectures: Friday 9-11 in MP 118
Tutorial: Monday 10-11, MP 118
Instructor: Toniann Pitassi, SF 2305A, 978-3695, toni@cs.toronto.edu
Office hours: Friday 11-12
Tutors: Kaveh Ghasemloo(kaveh@cs)
Web Page: http://www.cs.toronto.edu/ toni/Courses/438-2009/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:

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 5, Oct 19, Nov 16, Dec 4.
Note the first three assignments are due on Monday before tutorial and the last assignment is due before the last class on Friday.
The term test will be held in class on Friday October 23.
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 preare 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)