COMP 523 : Language-based Security
Schedule – Winter 2008

Brigitte Pientka

Date		Lecture	Reading	Homework
Th	3 Jan	Introduction – Formal syntax	Ch 1, Ch 2	
Tu	8 Jan	Operational Semantics	Ch 3, Ch 4	HW 1 out
Th	10 Jan	No class	Ch 3, CH 4	
Tu	15 Jan	Operational semantics – cont	Ch3, Ch 4, Ch 8	
Th	17 Jan	Type systems	Ch 5, Ch 9	
Tu	22 Jan	Extensions: Let, Pairs	Ch 11.5, Ch 11.6	
Th	24 Jan	Normalization	Ch 12	HW1 due HW2 out
Tu	29 Jan	Extension: References	Ch 13	
Th	31 Jan	Type inference	Ch 22	
Tu	5 Feb	Type inference	Ch 22	
Th	7 Feb	Universal Polymorphism	Ch 23	HW2 due HW3 out
Tu	12 Feb	Subtyping	CH 15, CH 16	
Th	14 Feb	Subtyping	CH 15, CH 16	
Tu	19 Feb	Review		
Th	21 Feb	Midterm	HW3 due	
Tu	26 Feb	Break		
Th	28 Feb	Break		
Tu	4 Mar	Mechanizing the meta-theory of programming languages		
Th	6 Mar	Introduction to logical frameworks		
Tu	11 Mar	Programming with types		
Th	13 Mar	Programming with proofs		HW4 out
Tu	18 Mar	Programming with proofs		
Th	20 Mar	Holiday		
Tu	25 Mar	Dependent types		
Th	27 Mar	Modal types		HW4 due HW5 out
Tu	2 Apr	Functional programming with HOAS		
Th	4 Apr	Functional programming with HOAS		
Tu	8 Apr	Substructural type systems		
Th	10 Apr	Overflow		

General information about the course

There is a home page for the course

`http://www.cs.mcgill.ca/~bpientka/courses/comp523`

We will place useful information there. This includes assignments, hints, examples of code, office hours and the lecture schedule in postscript format and pdf format. Some material will be in plain format. You can find the Adobe Acrobat reader (for pdf) or Ghostview (for postscript) available free on the web in order to read and print the files.

The first half of the course follows the text book "Types and programming languages" by Benjamin Pierce. We strongly recommend you get a copy of this book. In the second half, we will follow some handbook articles, journal and conference papers, as well as my own notes.

In the second half of the course, we will be using the logical framework Twelf to formalize some of the meta-theory about programming languages. Twelf is running on the department's lab machines. You can find more information about how to run it within emacs on the course website later. If you have your own computer you will want to download a free copy of Twelf and run it on your own machine.

We recommend the editor emacs or xemacs. If you are an emacs user the Sml-mode under emacs environment is an excellent programming environment. If you have your own computer you will want to download a free copy of SML/NJ and run it on your own machine. Check the "Resources" tab on the web page for instructions on obtaining Sml. Information about the course can be found on the course webpage.

Method of evaluation

There will be five assignments (30 %), a midterm (20 %), a final examination (30%) and a mini-project (20 %). The assignments will be a mix of programming and theoretical exercises. The assignments will be a mix of programming and theoretical exercises. Late homework will be accepted only under exceptional circumstances.

The mid-term and final examination will be closed book, but you may bring a cheat sheet.

Some possible project topics will be handed out in class, but you are encouraged to suggest your own. The purpose of this mini-project is to read a recent research paper in programming languages, present it in class, and provide a critical summary. A cricial summary includes:

- What problem does the paper address.
- How does the paper solve this problem.
- Why is the contribution important and how do other approaches solve this problem.
- Demonstrates your own understanding by for example: 1) giving a small prototype of the work described in the paper 2) formalizing the theory in a proof assistant 3) providing several own examples which illustrate a key point

- What problems does the paper not solve (but could be addressed in the future).

Evaluation of the project:

- Meetings with the instructor to discuss the project (2%)
- Project proposal (one page) (2%)
- Project report (5 pages) (8%)
- Project presentation in class (8%)

Office hours

These office hours are tentative. Please check the web-site, if they have changed.

Wednesday	2:30	-	4:00	Prof. B. Pientka	ENGMC 107N