COSC 4301/5423 3.0 Programming Language Design

Winter 1999

Brief overview

This course addresses the design, the definition and the implementation of programming languages. The main focus will be on the design and the definition of programming languages. The implementation of programming languages is the topic of COSC 4302 3.0. Special attention will be given to the object-oriented language Java$^{\mathrm{TM}}$ and functional language Standard ML. Formal methods to design and define programming languages including BNF, type systems and transition systems will be studied. The design and the definition of fundamental concepts in programming languages including types, control structures and abstraction mechanisms will be looked at in detail.

General information

Time: Monday and Wednesday, 17:30–19:00
Place: CCB 129
Instructor: Franck van Breugel
    Office: CCB 348
    Office hours: Tuesday and Thursday, 16:00–17:00
    Email: franck@ariel.cs.yorku.ca
Prerequisites: general prerequisites, including COSC 3301 3.0

Reference material

Class notes and handouts will be crucial. A collection of papers will be made available to the students.

An introduction to Java can be found in

* Mary Campione and Kathy Walrath. *The Java Tutorial: Object-Oriented Programming for the Internet*. Second edition. Addison-Wesley. 1998.

and

* Robert Harper. *Programming in Standard ML*. 1998.

gives an introduction to Standard ML. Java is defined in

* James Gosling, Bill Joy and Guy Steele. *The Java Language Specification*. Addison-Wesley. 1996.

and Standard ML in

* Robin Milner, Mads Tofte, Robert Harper, and David MacQueen. *The Definition of Standard ML – Revised*. The MIT Press. 1997.

Apart from the last book, all are available online. Summaries of parts of the last book will be made available to the students.

The following books are suggested for further reading on programming language design.

* Terrence Pratt and Marvin Zelkowitz. *Programming Languages: Design and Implementation.* Third edition. Prentice Hall. 1995.
* Ravi Sethi. *Programming Languages: Concepts and Constructs.* Second edition. Addison-Wesley. 1996.
* Raphael Finkel. *Advanced Programming Language Design.* Addison-Wesley. 1995.

Evaluation

The student's performance in the course will be evaluated as a combination of a final exam (50%), a mid term (25%) and assignments (25%). More details are given below. Students will not have the option of doing additional work to upgrade their mark.

Assignments: Undergraduate students may do their assignments in pairs. No late assignments will be accepted. If a student cannot hand in the assignment in time for reasons beyond his/her control, the student has to bring a documented note to the instructor. If accepted, the weight of the other assignments will be prorated accordingly. The assignments can be found at the URL

http://www.cs.yorku.ca/~franck/programming/

Mid term: The mid term will be held on Monday February 22. If a student misses the mid term for reasons beyond his/her control, the student has to bring a documented note to the instructor. If accepted, the weight of the final exam will be prorated accordingly.

Final exam: The final exam will be held in the examination period. If a student misses the final exam for reasons beyond his/her control, the student has to bring a documented note to the instructor. If accepted, the student has to take a replacement exam.

Additional information can be found at the URL

http://www.cs.yorku.ca/~franck/programming/