

Course Information

Time and place

Place: HRBB 104
Time: 3:55 pm – 5:10 pm, TuTh
Pre-requisite: C++ programming experience highly recommended

Course personnel

Instructor: Lawrence Rauchwerger
Office HRBB 425 F
email: rwerger
Phone 845 - 8872
Hours after class

Text Book

A. Aho, R. Sethi, J. Ullman, M. Lam *Compilers: Principles, Techniques and Tools* 2nd Edition, Addison-Wesley Publishing Company, New York, New York, 2006.

Additional readings will be made available.

Website: <http://parasol.tamu.edu/~rwerger/Courses/434/>

Tentative Grading

Midterm I: 25%
Midterm II: 25%
Project: 50%

There will be written assignments. In general, no late assignments are accepted. The project consists writing a simple compiler for a simple object-oriented language. Students are expected to use the *flex* and *bison* tools and code in C++.

Course Description

Introduction to practical compiler construction. Topics include formal programming language translation, program syntax, semantics, finite state machines, regular expressions, context-free parsing techniques such as LL(k) and LR(k), code generation, simple optimizations.

Here is a brief outline of the tentative topics that will be covered:

- Lexical analysis (scanning, scanner generation)
- Parsing (recursive descent, LL(1), LR(1))
- Context-sensitive analysis (*ad hoc* techniques and attribute grammars or syntax-directed translation)
- Intermediate representations
- The procedure abstraction and how to implement it
- Heap management
- Simple code generation
- Instruction selection (better code generation)
- Register allocation (better code generation)
- Code improvement techniques (data-flow analysis, dependence analysis, simple transformations)

All the lectures use overhead transparencies which will be available to students before the lecture on the class website.

Project

The project will include several deliverable phases:

1. A lexical analyzer using *flex*
2. A basic parser using *bison*
3. Code generation
4. Simple code optimization

There will be no credit for the class without completed projects !

NOTICE:

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