CSE 401 Introduction to Compiler Construction

Credits
4.0 (3 hrs lecture, 1 hr section)

Lead Instructor
Hal Perkins

Textbook
Engineering a Compiler, Cooper & Torczon

Course Description
Fundamentals of compilers and interpreters; symbol tables; lexical analysis, syntax analysis, semantic analysis, code generation, and optimizations for general purpose programming languages. No credit to students who have taken CSE 413.

Prerequisites
CSE 332; CSE 351

CE Major Status
Selected Elective

Course Objectives
Learn principles and practice of language implementations. Understand tradeoffs between run-time and compile-time processing. Understand tradeoffs between language features, run-time efficiency, and implementation difficulty. Gain experience working with large systems software, object-oriented design, and Java.

ABET Outcomes
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (H)
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives (H)
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions (H)
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (H)

Course Topics
- Regexps and scanners
- Grammars and ambiguity (3.1-3.3)

- LR (bottom-up) parsing
- Parser Construction
- LR table construction
- LR conflicts, first
- ASTs & visitors;
- LL Parsing & recursive descent (3.3)
- Intro to semantics and type checking (4.1-4.2)
- Semantics; Attribute grammars (4.3)
- Symbol tables and representation of types
- x86-64 (everything you forgot from 351)
- Code shape - objects and dynamic dispatch
- Finish codeshape
- IRs