

CSE 4251 Compiler Theory (3 credits)

Primary instructor: Ryan Stansifer

Textbooks and references:

A. W. Appel, Modern Compiler Implementation in Java. Cambridge, 2002. (T)

Course information:

2014–2015 Catalog description: CSE 4251 Compiler Theory (3 credits). Introduces formal languages, the construction of scanners and recursive descent, LL (1) and LR (1) parsers, intermediate forms, symbol tables, code generation and optimization of resultant code. Prerequisites: CSE 2010, CSE 3101 or ECE 2552, ECE 3551.

Prerequisites by topic: Computer organization, control structures, data structures, interfaces between assembly and higher-level languages, debug code

Place in program: Advanced elective

Course outcomes & related student outcomes: The student will be able to

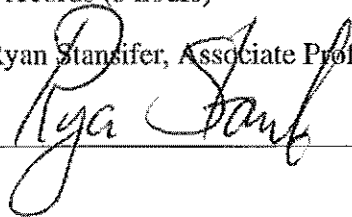
1. Use make, makefiles, and Java jar files in project development. (3: Skillful use of tools)
2. Construct a lexical analyzer (scanner) using regular expressions and a scanner generator tool. (4a: Skillful software construction)
3. Understand the theory of scanning so that a scanner generator can be implemented.
4. Construct a parser using LL or LALR(1) grammars and a parser generator tool. (4a: Skillful software construction)
5. Understand the theory of parsing so that a parser generator for LL(1), SLR, LR(1), and LALR(1) grammars can be implemented. (1: Fundamental knowledge)
6. Construct abstract syntax trees. (4b: Satisfaction of requirements)
7. Implement symbol tables. (4c: Trade-offs in design choices)
8. Understand and implement non-local variable access. (4a: Skillful software construction)

Topics covered:

1. Introduction, software development, and definition of a compiler (3 hours)
2. Regular expressions, FSA, NFA, and DFA (5 hours)
3. Parsing (LL, LR, LR(0), SLR, LR(1), and LALR(1)) (5 hours)
4. Constructing syntax trees (3 hours)
5. Symbol tables, type checking, and semantic analysis (3 hours)
6. Activation records (3 hours)

Approved by: Ryan Stansifer, Associate Professor, Director of Computer Science Programs

Signature: _____



Date: _____

30 Jan 2015