COURSE SYLLABUS

Note: This syllabus is tentative. It will be updated throughout the rest of the term to incorporate additional readings and indicate our actual progress.

Tue. Sep. 5: Lecture 1 – Course Overview

Topics: What is a compiler? Compilers vs. Interpreters. Stages of a compiler. Administrivia

Fri. Sep. 8: Lecture 2 – Abstract Syntax and Interpretation

Out: PS1 (KITTY interpreter)

Tue. Sep. 12: Lecture 3 – Automata Theory

Topics: Introduction to lexical analysis. Overview of automata theory: Deterministic finite automata, nondeterministic finite automata, regular expressions, regular grammars

Fri. Sep. 15: Lecture 4 – ML-Lex

Topics: ML-Lex, a scanner generator.
Due: PS1 (KITTY interpreter, Part 1)
Out: PS2 (KITTY scanner)

Tue. Sep. 19 – No class; Lyn away at a conference.

Fri. Sep. 22 – No class; Lyn away at a conference.

Tue. Sep. 26: Lecture 5 – Simple Parsing

Topics: Recursive descent parsing. Backtracking.
Due: PS1 (KITTY interpreter, Part 2)

Fri. Sep. 29: Lecture 6 – Monadic Parsing

Due: PS2 (KITTY scanner)
Out: PS3 (KITTY monadic parser)

Tue. Oct. 3: Lecture 7 – MIPS assembly language

Fri. Oct. 6: Lecture 8 – Compiling to Assembly Language

Due: PS3 (KITTY monadic parser)
Out: PS4 (KITTY/MIPS back end)
Tue. Oct. 10: No Class -- Fall break

Fri. Oct. 13: Lecture 9 -- Type Checking

  Topics: The BOBCAT language, type checking
  Out: PS5 (BOBCAT type checker)

Tue. Oct. 17: Lecture 10 – LL Parsing

  Topics: Predictive parsing. First and follow sets. LL(k) parsing.

Fri. Oct. 20: Lecture 11 – Simple LR (SLR) Parsing

  Due: PS4 (KITTY/MIPS back end)

Tue. Oct. 24: Lecture 12 – LALR Parsing

Fri. Oct. 27: Lecture 13 – ML-Yacc

  Topics: ML-Yacc: A parser generator
  Due: PS5 (BOBCAT type checker)
  Out: PS6 (BOBCAT parser)

Tue. Oct. 31: Lecture 14 – Compiling Function Calls

  Topics: Activation records, registers vs. stacks, caller saves vs. callee saves

Fri. Nov. 3: Lecture 15 – Intermediate Representation (IR) Trees

  Due: PS6 (BOBCAT parser)
  Out: PS7 (BOBCAT/MIPS back end)

Tue. Nov. 7: Lecture 16 – Compiling Compound Data

  Topics: Arrays and records in COUGAR. Data layout. Heap allocation.

Fri. Nov. 10: Lecture 17 -- Basic Blocks

  Due: PS7 (BOBCAT/MIPS back end)
  Out: PS8 (COUGAR front end)

Tue. Nov. 14: Lecture 18 – Control Flow Analysis

Fri. Nov. 17: Lecture 19 – Data Flow Analysis/Liveness

  Due: PS8 (COUGAR front end)
  Out: PS9 (COUGAR back end)

Tue. Nov. 21: Lecture 20 – Register Allocation

Fri. Nov. 24: No class- Thanksgiving break

Tue. Nov. 28: Lecture 21 – Semantic Analysis
Fri. Dec. 1: Lecture 22 – Instruction Scheduling

Due: PS9 (COUGAR back end)  
Out: PS10 (TIGER compiler)

Tue. Dec. 5: Lecture 23 -- Compiling to CISC machines

Fri. Dec. 8: Lecture 24 – To Be Announced

Due: PS10 (TIGER compiler)

There will be no final exam in CS301!