Syllabus
COEN 259 Compilers
Department of Computer Engineering
Santa Clara University

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Course website: http://www.cse.scu.edu/~mwang2/compiler/
Office Hours: Tuesday & Thursday 9:00-9:30pm

Winter Quarter 2016

Course Description
Principles and practice of the design and implementation of a compiler, focusing on the application of theory and trade-offs in design. Lexical analysis, syntactic analysis, semantic analysis, symbol tables, type checking, run-time organization, code generation, optimization and data-flow analysis.

Prerequisites
Prerequisites: Principles of Programming Languages (COEN 256) or Operating Systems (COEN 283) or Computer Architecture (COEN 210).

Required Textbooks

Recommended Textbooks

References

Course Objectives
1. To learn advanced and cutting edge state-of-the-art knowledge and implementation in compilers.
2. To read and understand research publications in the technical area of compilers, beyond that of the traditional textbook level.
3. To conduct independent project and to equip for scholarly research in Compilers.
4. Explore parallel/distributed language compiler design or other advanced topics if time permit.

Expected Learning Outcomes
1. Demonstrate the knowledge of compiler front-end theory including lexical analysis, syntactic analysis, semantic analysis, type checking, symbol tables, etc.
2. Demonstrate the knowledge of compiler back-end theory including intermediate code generation, run-time organization, code generation, optimization, data-flow analysis, etc.
3. Demonstrate the ability to implement a subset of a high-level language compiler.
4. Demonstrate the ability to do research in compiler: able to read/understand current research papers and implement research group
project in compiler optimization, parallelization, vectorization, virtualization, or VLIW.

**Grading Policy**
Course grade is determined based on the total score (maximum 1100 points + up to 200 optional bonus points for extra work) from:

1. Mid-term and final exams of 200 points each (close book with one A4 note, no sitting together, no wireless connection.) Makeup exams (must have a very good reason) are much difficult than normal exams.
2. Two programming assignments of 200 points each (late penalty: 40 points/day.) Makeups are more difficult too. You can call Design Center at 408/554-4909 for setup account or IT support, and ssh linux.scudc.scu.edu to work remotely.
3. A group (2-3 people in a team) programming term project of 300 points (late penalty: 60 points/day.) No makeup is allowed.
4. Bonus assignments will be assigned at each week with 20 points each. Due before next lecture begin by email to me (in plain text or PDF) with title "coen259 bN" (where N can be 2, 3,…,10) and cc to the grader. The solution for bonus assignments will be posted on my protected web page. Please read solutions of bonus assignments before asking questions. No late work accepted for bonus assignments. 75-80% of exam questions are similar to bonus assignments.
5. Class average targeted at A-.

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<th>Table 2: Course Schedule (Tuesday &amp; Thursday 7:10pm-9:00pm)</th>
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| 8 | 2/23 2/25 | ILP | last withdraw date 2/19 |
| 9 | 3/1 3/3 | parallelism & locality | proposal due 2/23 |
| 10 | 3/8 3/10 | interprocedural | final exam 3/10 |
| 11 | 3/15 | review/evaluation | project defense 3/15 |

**Reminder**
- No cheating, and no register complaint without talking to me first.
- No incomplete. No sit-in or audit the class except formally registered.
- Read files under /home/mwang2/tips for help.
- Handouts, assignments, and solutions will be posted on the web. You should check the class web site at least once a week. You are responsible for printing and bring the handout to the class.
- Office hours: Tuesday & Thursday 9:00pm-9:30pm.

**Honor Code**
All students taking course in the school of engineering agree, individually and collectively, they will neither give nor receive unpermitted aid in examinations or other course work that is to be used by the instructor as a basis of grading.

**Disability Accommodation Policy:**
To request academic accommodations for a disability, students must contact Disability Resources located in The Drahmann Center in Benson, room 214, (408) 554-4111; TTY (408) 554-5445. Students must provide documentation of a disability to Disability Resources prior to receiving accommodations.