CS 450/550: Programming Language Translation

Instructor

Instructor:	Jim Buffenbarger
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Meetings

Lectures:	MoWe 4:30–5:45	MEC-309
Office hours:	MoWe 3:30–4:30	MEC-302C
	by appointment	MEC-302C

Our graduate assistant is Farhad (`frasapour@gmail.com`). You can find his schedule at:

`http://coen.boisestate.edu/cs/computer-science-tutoring-center-cstc`

Catalog Description

Theory/practice of formal-language translation and experience with Unix compiler-construction tools. Students work on significant projects.

PREREQ: CS 253, CS 321, and CS 354.

In addition, familiarity with Unix, Pascal, C, C++, and Java is assumed.

Goals

At the end of the course, the student will be able to do the following:

- lexical analysis
- syntax analysis
- syntax-directed translation

- type checking
- code optimization
- code generation
- understand run-time environments
- use practical tools, and understand their formal models and underlying algorithms

Textbook

- *Compilers: Principles, Techniques, and Tools*, Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman, Second edition, Addison-Wesley, 2007, ISBN: 9780321486813.

Other resources can be found at:

```
http://cs.boisestate.edu/~buff/links/sw.html
```

Grading

At the end of the course, a letter grade is assigned to each student according to rank among classmates, which is determined from numerical scores assigned for performance of these activities:

Activity	*Weight*
Homework	50%
Exam	25%
Final	25%

Homework

Several homework sets are assigned during the semester. Most are relatively large programming assignments.

Exams

An exam and a final are administered during the semester. These are in-class, open-note, and open-textbook (but no other books) tests.

Documentation Standards

Good documentation and programming style is very important. Your programs must demonstrate these qualities for full credit. Good documentation and programming style includes:

- heading comments giving: author, date, class, and description
- function/procedure comments giving description of: purpose, parameters, and return value
- other comments where clarification of source code is needed
- proper and consistent indentation
- proper structure and modularity

When you submit a program, include: the source code, sample input data, and its corresponding results.

Due Dates

Homework is due at 11:59PM, Mountain Time, on the day it is due. Late work is not accepted. To submit your solution to an assignment, login to a lab computer, change to the directory containing the files you want to submit, and execute:

```
submit buff class assignment
```

For example:

```
submit buff cs101 hw1
```

The `submit` program has a nice `man` page.

Makeup examinations are not normally administered.

Scores are posted near my office, as they become available. You are encouraged to check your scores to ensure they are recorded properly. If you feel that a grading mistake has been made, contact me within two weeks of the date that work is returned. Old scores are not changed.

Academic Integrity

The University's goal is to foster an intellectual atmosphere that produces educated, literate people. Because cheating and plagiarism are at odds with that goal, those actions shall not be tolerated in any form. Academic

dishonesty includes assisting a student to cheat, plagiarize, or commit any act of academic dishonesty. Plagiarism occurs when a person tries to represent another person's work as his or her own or borrows directly from another person's work without proper documentation.

If a student engages in academic dishonesty, the student may be dismissed from the class and may receive a failing grade. Other penalties may include suspension or expulsion from the University.

Much more information about academic integrity, including examples of academic dishonesty, is at:

`http://cs.boisestate.edu/~buff/files/www-integrity.pdf`

If you are unsure about a particular behavior, ask your instructor.

Labs

Each student receives an account on the cluster of computers in the Computer Science Lab (ENGR-213/214). The cluster comprises a server named `onyx.boisestate.edu` and a set of nodes with shared home directories. It is remotely accessible, via SSH. The cluster runs the Linux and Windows operating systems, via VMware.

Physical access requires building and room access. After hours building access, and all-hours room access, require an authenticated proximity-type student-identification card.

You are responsible for understanding and obeying lab rules:

`http://coen.boisestate.edu/its/lab-rules`

Schedule

Week	*Date*	*Topic*	*Assigned*	*Due*	*Reading*
1	Jan 12 Mon	Introduction			1
	Jan 14 Wed		HW#1		
2	Jan 19 Mon	MLK Day			
	Jan 21 Wed	A Simple Translator			2
3	Jan 26 Mon				
	Jan 28 Wed				
4	Feb 02 Mon		HW#2	HW#1	
	Feb 04 Wed				
5	Feb 09 Mon				
	Feb 11 Wed	Lexical Analysis			3
6	Feb 16 Mon	President's Day			
	Feb 18 Wed				
7	Feb 23 Mon				
	Feb 25 Wed				
8	Mar 02 Mon		HW#3	HW#2	
	Mar 04 Wed	Syntax Analysis			4
9	Mar 09 Mon				
	Mar 11 Wed		HW#4	HW#3	
10	Mar 16 Mon				
	Mar 18 Wed				
11	Mar 23 Mon	Spring Break			
	Mar 25 Wed	Spring Break			
12	Mar 30 Mon				
	Apr 01 Wed	Exam			
13	Apr 06 Mon		HW#5	HW#4	
	Apr 08 Wed				
14	Apr 13 Mon	Syntax-Directed Translation			5
	Apr 15 Wed				
15	Apr 20 Mon	Intermediate-Code Generation			6
	Apr 22 Wed				
16	Apr 27 Mon	Run-Time Environments		HW#5	7
	Apr 29 Wed				
17	May 06 Wed	Final: 3:00-5:00			