CS 354: Programming Languages

Instructor

Instructor:	Jim Buffenbarger
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Meetings

Lectures:	TuTh 9:00–10:15	CCP-260
Office hours:	TuTh 10:15–11:15	CCP-359
	by appointment	CCP-359

Our Teaching Assistant / Grader is Brandon Fung:

```
brandonfung@u.boisestate.edu
```

CS Tutoring Center office hours can be found at:

```
onyx:~jbuffenb/classes/354/pub/TutorOfficeHours
```

Catalog Description

Principles of programming languages: design, syntax, semantics, information binding, strings, arithmetic, input/output, recursion and extensibility.

PREREQ: CS 321.

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

Goals

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

- identify characteristics of procedural, object-oriented, functional, and scripting languages

- describe the phases of program translation

- explain different forms of binding, visibility, scoping, and lifetime management

- demonstrate the differences between various parameter passing methods

- explain the concepts of encapsulation, abstraction, inheritance, and polymorphism

- write programs in languages based on several different programming paradigms

- evaluate a language on the basis of the various features which it supports

Students also experience working on a team, developing a website, and giving an oral presentation.

Textbook

- *Programming Language Pragmatics*, Michael L. Scott, Fourth edition, Elsevier: Morgan Kaufmann, 2015, ISBN: 9780124104099.

Other Course Material

This syllabus, lecture slides, assignments, and other material is available on the computers in the Computer Science Labs (CCP-240, CCP-241, and CCP-242), served by `onyx.boisestate.edu`, which is remotely accessible, via Secure Shell (SSH). It is *not* on the WWW, Blackboard, or elsewhere. It is in what is called our "`pub`" directory:

```
onyx:~jbuffenb/classes/354/pub
```

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
Textbook Assignments	12%
Language Assignments	25%
Interpreter Assignments	15%
Language Website	18%
Exam	15%
Final	15%

Textbook Assignments (TA)

Several problem sets are assigned, from the exercises at the end of each chapter of the textbook. Students work on these individually, not as teams.

Language Assignments (LA)

Several small programs are assigned, to be developed in what are expected to be unfamiliar programming languages (e.g., C#). Open-source translators for these languages are available on the Linux computers in the Computer Science lab. Students work on these individually, not as teams.

Interpreter Assignments (IA)

A couple of programs are assigned, to extend a provided Java implementation of a simple programming-language interpreter. A Java development environment is available on the Linux computers in the Computer Science lab. Students work on these individually, not as teams.

Language Website (LW)

Each team of students develops a website dedicated to a particular, unfamiliar, programming language. Teams are formed, and languages are assigned, randomly. Several milestones are assigned. Open-source translators for these languages are available on the Linux computers in the Computer Science lab. Results are shared in an team-delivered oral presentation. Of course, students work in teams.

Exam and Final

An exam and a final are administered. These are in-class, open-note, and open-textbook (but no other books) tests. Of course, students work on these individually.

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 jbuffenb class assignment
```

For example:

```
submit jbuffenb 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 and Safety

Each student receives an account on the cluster of computers in the Computer Science Labs: CCP-240, CCP-241, and CCP-242. 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

The health and safety of all members of our academic community is very important. While computer science is a relatively safe science/engineering discipline, dangers exist, and we should be prepared for them. Basically, call 911 to report an emergency. Beyond that, please take a moment to review this common-sense information:

http://coen.boisestate.edu/cs/safetydocument

Schedule

Week	Date	Topic	Assigned	Due	Reading
1	Jan 14 Tue	Introduction			1
	Jan 16 Thu				
2	Jan 21 Tue	Programming Language Syntax			2.0-2.1
	Jan 23 Thu				
3	Jan 28 Tue	Names, Scopes, and Bindings	LA1,TA1		3
	Jan 30 Thu				
4	Feb 04 Tue				
	Feb 06 Thu				
5	Feb 11 Tue		IA1		
	Feb 13 Thu			LA1	
6	Feb 18 Tue		IA2		4.0-4.1
	Feb 20 Thu			TA1	
7	Feb 25 Tue	Control Flow			6
	Feb 27 Thu		LA2,TA2	IA1	
8	Mar 03 Tue				
	Mar 05 Thu	Data Types			7-8
9	Mar 10 Tue	Exam			
	Mar 12 Thu		LW1	LA2	
10	Mar 17 Tue				
	Mar 19 Thu			IA2,TA2	
11	Mar 24 Tue	Spring Break			
	Mar 26 Thu	Spring Break			
12	Mar 31 Tue		LA3		
	Apr 02 Thu	Subroutines and Control Abstractions			9.0-9.4
13	Apr 07 Tue				
	Apr 09 Thu		LA4		
14	Apr 14 Tue		LW2	LA3,LW1	
	Apr 16 Thu		LA5,TA3	LA4	
15	Apr 21 Tue			LW2	
	Apr 23 Thu				
16	Apr 28 Tue	Presentations		LA5,TA3	
	Apr 30 Thu	Presentations			
17	May 05 Tue	Final: 9:30-11:30			