CS 354: Programming Languages

Instructor

Instructor:	Jim Buffenbarger
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Office:	CCP-359 426–3567

Meetings

Lectures:	TuTh 9:00–10:15	CCP-259
Office hours:	TuTh 10:15–11:15	CCP-359
	by appointment	CCP-359

Our Teaching Assistant is Kiran. His email address is shown below, as is his initial office hours and the URL of the CS Tutoring Center schedule:

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

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	Aug 22 Tue	Introduction			1
	Aug 24 Thu				
2	Aug 29 Tue				
	Aug 31 Thu	Programming Language Syntax			2.0-2.1
3	Sep 05 Tue				
	Sep 07 Thu	Names, Scopes, and Bindings	LA1,TA1		3
4	Sep 12 Tue		IA1		
	Sep 14 Thu				
5	Sep 19 Tue			LA1,TA1	
	Sep 21 Thu				
6	Sep 26 Tue		IA2	IA1	4.0-4.1
	Sep 28 Thu	Control Flow			6
7	Oct 03 Tue		LA2,TA2		
	Oct 05 Thu				
8	Oct 10 Tue				
	Oct 12 Thu	Data Types			7-8
9	Oct 17 Tue	Exam		LA2,TA2	
	Oct 19 Thu		LA3		
10	Oct 24 Tue		LW1		
	Oct 26 Thu			IA2	
11	Oct 31 Tue		LA4	LA3	
	Nov 02 Thu	Subroutines and Control Abstractions			9.0-9.4
12	Nov 07 Tue				
	Nov 09 Thu				
13	Nov 14 Tue		LW2	LW1	
	Nov 16 Thu		LA5,TA3	LA4	
14	Nov 21 Tue	Thanksgiving			
	Nov 23 Thu	Thanksgiving			
15	Nov 28 Tue	Presentations			
	Nov 30 Thu	Presentations			
16	Dec 05 Tue	Presentations			
	Dec 07 Thu	Presentations			
17	Dec 12 Tue	Final: 10:00-12:00			

Note well:

- For section 1, homework will be available (online) one day earlier than shown, to synchronize with section 2.

- For section 2, homework will be due (online) one day later than shown, to synchronize with section 1.