CSCI 141: Programming for the Natural Sciences

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Meetings MWF 12:00-12:50 in Thompson 409. The final will be on May 12th at 12:00.

Course Description

This course is aimed at introducing students in the natural sciences to computer programming in a way that will be useful to them. Problems will be drawn especially from the fields of biology and chemistry.

We will be using the Python programming language, in conjunction with Jupyter. Python is a modern, high-level language that was designed with beginners in mind. It is not as efficent as other languages such as Java or C++, but it is much easier to write and maintain Python programs than those in other languages. Jupyter is an application that allows you to create a "notebook" of active, annotated programs, in order to supplement your traditional lab notebook. Should you choose to continue in computer science, the skills you learn here will easily transfer to learning other programming languages.

Topics Covered ("Learning Outcomes")

In the course of learning Python, students will also gain familiarity with basic programming ideas, including:

- Elementary arithmetic and string manipulation.
- Reading and writing files.
- Conditional logic.
- Loops, including nested loops.
- Use of functions.
- Debugging and programming practices.
- Lists, tuples, and similar data structures.
- Object-oriented programming.

Web Page The class web page will be located at http://mathcs.pugetsound.edu/~aasmith/cs141/. Valuable info and links will be posted there.

Text Weekly readings will come from the books PYTHON FOR BIOLOGISTS and ADVANCED PYTHON FOR BIOLOGISTS by Martin Jones.

Prerequisites You should have already had three years of high school math, or taken MATH 110. Further, students who have already received credit for CSCI 161 or 261 will not receive credit for CSCI 141.

Course Policies

There will be twelve assignments over the course of the class—usually one each week. You are free to talk to others in the class about them, but I expect what you finally turn in to be *100% your own work*. The final homework assignment will be open-ended, in order to allow you a chance to apply your newly learned knowledge to one of your other science classes or projects.

Assignments will be penalized by 20% for each working day (or fraction thereof) they are late, down to 40%. However, you will have five "extension days" during the semester

to extend a deadline by one working day. These are intended for unforeseen circumstances, and will be used automatically unless you specify otherwise.

You all should be aware of the Honor Code at the college. Please do not cheat—it will not go well for you. *Any suspected cheating will be immediately reported.*

Exams are closed book, and will be cumulative. You are allowed a calculator (or your phone, so long as it is in "airplane mode") and one two-sided, letter-sized page of notes.

Grading

Final grades will be determined as follows:

Homeworks	Midterm 1	Midterm 2	Final
35%	20%	20%	25%

In particular, notice how heavily weighted assignments are. *Missing assignments is the easiest way to get a lower grade.* Please be sure you do them, and on time.

Tests will be cumulative. They will be graded on a curve, with the highest score considered to be 100%. In addition, class participation and effort may help bump you up, if your final grade is borderline.

Tutoring

The department offers a drop-in tutoring session in this room most evenings. Please take advantage of this if you feel yourself dropping behind!

Attendance

I will not be keeping attendance (except on the first day). However, odds are that your attendance will correlate highly with your final grade.

Boilerplate

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Peggy Perno, Director of the Office of Accessibility and Accommodation, 105 Howarth, 253.879.3395. She will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Please review university emergency preparedness and response procedures posted at `www.pugetsound.edu/emergency/`. There is a link on the university home page. Familiarize yourself with hall exit doors and the designated gathering area for your class and laboratory buildings. If building evacuation becomes necessary (e.g. earthquake), meet your instructor at the designated gathering area so she/he can account for your presence. Then wait for further instructions. Do not return to the building or classroom until advised by a university emergency response representative. If confronted by an act of violence, be prepared to make quick decisions to protect your safety. Flee the area by running away from the source of danger if you can safely do so. If this is not possible, shelter in place by securing classroom or lab doors and windows, closing blinds, and turning off room lights. Lie on the floor out of sight and away from windows and doors. Place cell phones or pagers on vibrate so that you can receive messages quietly. Wait for further instructions.

Miscellany

If there are any special holy days that you will be taking off, please let me know as soon as you can so that we can work around them.

Please consider getting a flu shot. Influenza kills, and disease can spread rapidly in the dorms. (And you really don't want to miss a week of class. Trust me.)

Finally...if there's anything else I can do to help you, please let me know. I'm willing to go out of my way to make this a valuable class for you, but I can't do that unless you talk to me.