CSCI 361: Algorithms & Data Structures

Professor
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Thompson 390:
Office MW 1:30-3:00, Tu 1:00-2:00
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Meetings
MWF 9:00-9:50 in Thompson 399. The final will be on December 11th at 8:00.

Course Description
Welcome to Algorithms.

In many ways, this course is the most important one in the Computer Science major. We have built you up in previous courses, teaching you to plan out and to construct programs. In courses after this one, we will teach you specific applications such as databases and artificial intelligence. All of this revolves around the construction, analysis, and use of algorithms.

An algorithm is a recipe; it is step-by-step procedure for calculating something. Of course, not all algorithms are created equal. Some are so useful that no one seriously considers any alternatives, some excel under particular circumstances, and some are so bad so as to be the punchline of particularly obscure jokes. You are here in this class so that you will be able to tell one from another.

Topics Covered/
Learning Outcomes
You will be able to understand, implement, and use the following tools:

• Formal analysis of algorithms.
• Advanced data structures.
• Advanced searching.
• Dictionary algorithms.
• Graph algorithms.

Web Page
The class web page will be located at http://mathcs.pugetsound.edu/~aasmith/cs361/. Valuable info and links will be posted there.

Text
The text we will use is “Algorithms (4th Ed.)” by Sedgewick and Wayne. The authors have also created valuable online resources, that you can access via the class web page.

Prerequisites
You should have already taken CSCI 261 (Computer Science II), CSCI 281 (Architecture), and MATH 210 (Math of Computer Science, may be concurrent), or their equivalents. Please talk to me as soon as you can if you have not had these classes.

Course Policies
There will be several assignments over the course of the class—usually one every other week. Most will be programming assignments, but some will be written work. 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. 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. They will be used automatically, unless you specify otherwise.

Note that these assignments will be substantially harder than the ones you may have had in previous classes. If you even remotely enjoy sleeping, do not wait until the night before they’re due to start them.
Most of you will probably do your work in Java, since that’s probably the language with which you are most comfortable. I’d also encourage you to teach yourself Python this semester, since it is a very useful language. However you may use any procedural or object-oriented language you wish.

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. They will be given in the evenings (or some other time when we can have two uninterrupted hours). 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. They will be graded on a curve, with the highest score considered to be 100%.

**Grading**

Final grades will be determined as follows:

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<thead>
<tr>
<th></th>
<th>Homeworks</th>
<th>Midterm 1</th>
<th>Midterm 2</th>
<th>Final</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>35%</td>
<td>20%</td>
<td>20%</td>
<td>25%</td>
</tr>
</tbody>
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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. In addition, class participation and effort may help bump you up, if your final grade is borderline.

**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.

**General UPS Info**

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/](http://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.