CSCI 136: Data Structures and Advanced Programming

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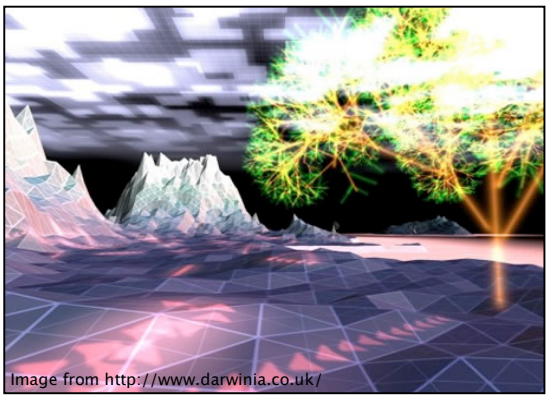
Office Hours: Mon 10am-12pm; Thu. 1- 2:30pm

TAs: Kyle Whitson and Steve Van Wert
Lectures: MWF 9-9:50pm in TPL 114
Labs: W 1-4pm in TCL 217a
Web Page: http://cs.williams.edu/~morgan/cs136/

Always refer to the web page for the latest information.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1 Text

The textbook for the course is:

> Bailey, Java Structures: Data Structures in Java for the Principled Programmer, $\sqrt{7}$ Edition, 2007
> http://www.cs.williams.edu/~bailey/JavaStructures/Book_files/JavaStructures.pdf

We provide a hardcopy of the text as a course reader, billed to your College account. Pick up your copy of this from Lorraine Robinson in TCL 303.

2 Description

This course couples work on program design, analysis, and verification with an introduction to the study of data structures. Data structures capture common ways in which to store and manipulate data, and they are important in the construction of sophisticated computer programs. We will use the Java programming language in class and for the assignments.

Students will be expected to write several programs, ranging from very short programs to more elaborate systems. Since one of our goals in this course is to teach you how to write large, reliable programs composed from reusable pieces, we will be emphasizing the development of clear, modular programs that are easy to read, debug, verify, analyze, and modify.

3 Evaluation

There will be weekly lab programming assignments. All programs will be graded on design, documentation and style, correctness, and efficiency. Programs must be turned in electronically by midnight (according to the CS server clock) on the due date, typically the Monday after lab. Late programs will not be accepted or graded.

We will use the computers in TCL 217a for the programming assignments. You will be given the electronic code to access this room during the first lecture. You may work on lab programs outside of class time in this room, and there will be evening TA hours. You may also work on other computers (e.g., at home), however it is solely your responsibility to ensure that your solutions work correctly on the lab computers and are submitted from the lab machines on time. The instructor and TAs will not provide support for working outside of lab.

Attendance in your scheduled lab is mandatory. Repeated unexcused absences from lab will result in failure of the course. You cannot attend the other lab session without explicit permission. If you are unable to attend because of illness you must e-mail the instructor as soon as possible. If you have a scheduled conflict for a particular session, you must obtain the instructor's written permission to be excused at least 24 hours in advance.

There will be two semester exams and a self-scheduled final exam. Homework exercises (non-programming assignments) will be assigned and collected in class periodically and there may be in-class quizzes.

You are responsible for learning all material in the textbook that is assigned as reading, the content of all labs and homeworks, all material from exams, and anything discussed in lecture or on the web page. If you miss a lecture, get notes from a classmate and come to office hours--there is likely material discussed that did not appear anywhere in writing.

The relative weight of each component of the course is:

Final Exam:	25%
Exam 1:	15%
Exam 2:	15%
Programs:	35%
Homework & Discussion:	10%

3.1 Extensions

You have three late days to use throughout the semester on any program or homework.

Each late day permits you to submit one assignment up to 24 hours late, without penalty. You do not need explicit permission to use these, however, please note **on the assignment** that it is late using a 'late day' and notify the instructor that you have submitted a late assignment to be sure that it is picked up and graded. Homework assignments are due at the beginning of class on the due date.

4 Honor Code

Refer to the College and Computer Science (http://www.cs.williams.edu/resources/usage.pdf) honor code policies in addition to the instructions provided here. Specific assignments may include additional instructions that have bearing on the honor code.

Homework and lab assignments are to be the sole work of each student unless the assignment explicitly states otherwise. Students are encouraged to discuss issues related to an assignment, **provided that such discussions are cited** in the material turned in. However, students may not collaborate on designing or writing code or writing up homework solutions. Uncredited collaborations are a violation of the honor code and will be handled appropriately.

For programming labs, you may **not** use any tools, including editors, reverse compilers, and debuggers, other than those provided to you by the CS department for use **in this course**. It is a violation of the honor code to look at or possess solutions to lab, homework, or exam problems (from this or previous semesters) written by anyone other than yourself prior to the respective deadline. The one exception is that you may consult practice exam solutions explicitly provided by the instructor for your use.

After an assignment has been submitted, you are free to share and discuss your solutions with other students in the course. You may not post solutions to assignments on the Internet.

If in doubt of what is appropriate, do not hesitate to ask me.

5 Tentative Schedule

"Ch" refers to required reading for that day from the textbook. You may perform the reading either before or after lecture. Note that there potentially will be no lecture held on Feb 18 and May 2. I may adjust the pacing of topics slightly based on your feedback.

Feb 1			Introduction Ch. 0
Feb 4-8	OOP and Java	More Java Ch. 1	Assert and Assoc
Feb 11-15	Vectors Ch. 2, 3	More Vectors Ch. 4	*Winter Carnival – No Class*
Feb 18-22	*No Class*	Recursion Ch. 5	Recursion
Feb 25-29	Complexity	Sorting Ch. 6	Sorting
Mar 3-7	Lists	Lists **Exam 1 in Lab**	Lists
Mar 10-14	Stacks Ch. 10	Stacks	Queues
Mar 17-21	*Spring Recess*		
Mar 24-28			
Mar 31-Apr 4	Iterators Ch. 7, 8	Comparables Ch. 11	Order
Apr 7-11	Trees Ch. 12	Implementing Trees	Traversing Trees
Apr14-18	Tree Representation	Priority Queues Ch. 13	Heapsort
Apr 21-25	Binary Search Trees Ch. 14	Binary Search Trees **Exam 2 in Lab**	Binary Search Trees
Apr 28-May 2	Graphs Ch. 16	Graphs	*TBD; maybe No Class*
May 5-9	Graphs	Dictionaries Ch. 15	Hashtables