

## CS230 Course Information

### 1 Contact Information

**Lecturer:**

*Name:* Franklyn Turbak (please call me “Lyn”)  
*Office:* SCI E126 (I’ve moved!)  
*Phone:* x3049  
*E-mail:* [fturbak@wellesley.edu](mailto:fturbak@wellesley.edu) (“Franklyn Turbak” in FirstClass)  
*Lectures:* SCI E111, Tue./Fri. 1:30–2:40pm  
*Office Hours:* Tuesday: 3:00–5:30pm  
Wednesday: 3:00–5:30pm  
Appointments can be made for other times. Note that meetings and seminars are sometimes held during my office hour times; in this case I may need to reschedule the office hours, in which case I will give you advanced warning.

**Lab Instructor:**

*Name:* Stella Kakavouli (please call me “Stella”)  
*Office:* SCI E131 (in the mini-mini-focus)  
*Phone:* x3120  
*E-mail:* [skakavou@wellesley.edu](mailto:skakavou@wellesley.edu) (“Stella Kakavouli” in FirstClass)  
*Labs:* Lab 01: Mon 1:30–2:40pm;  
Lab 02: Mon 2:50–4:00pm.  
*All labs are held in the mini-mini-focus* (ignore the room SCI257 listed in the official schedule).  
*Office Hours:* Wednesday: 9-10am  
Thursday: 1:30-2:40pm  
Appointments can be made for other times.

**Web Site:** <http://puma.wellesley.edu/~CS230>  
**First Class:** CS230-F02 Announcements, CS230-F02 Q&A  
**Tutor:** To be announced

### 2 Course Overview

CS230 focuses on five “big ideas”:

**Data Abstraction:** In order to cope with the complexity of large writing programs, it is desirable to express them as combinations of components whose behavior can be understood independently from their implementation. In CS111, you learned how methods provide an abstraction barrier between the caller and implementer of a method. We will review this notion and introduce abstract data types (ADTs) as a way of thinking about computational values and the operators that manipulate them.

**Modularity:** The ability to create complex artifacts (computational or otherwise) is enhanced if they can be composed out of reusable components with standard interfaces that can be combined in mix-and-match ways. We will study how to compose programs out of mix-and-match components.

**Efficiency:** Programs are often judged by how effectively they make use of resources such as space and time. We will study way to measure and compare the performance of programs. We will also learn about algorithmic complexity, a theoretical tool for analyzing the efficiency of algorithms. We will use this tool to evaluate various approaches to implementing data structures.

**Standard Tools:** We will learn some classical data structures and algorithms that should be in every programmer's bag of tricks.

**Program Development:** Unlike in CS111, where we mostly modified existing programs, in CS230 we will be creating many programs from scratch. We will get lots of practice with designing, implementing, testing, and debugging programs.

We will explore these ideas in the context of a variety of fundamental structures used in Computer Science, including lists, trees, stacks, queues, priority queues, sets, bags, and tables. We will use Java as the language for describing implementations of these structures.

### 3 Prerequisites

The prerequisite for CS230 is CS111, *Computer Programming and Problem Solving*. Students with significant programming experience who have not taken CS111 may take the course with permission of the instructor.

### 4 Classes

There are two 70-minute lectures each week, which will introduce the main content of the course. There is also a mandatory two-hour laboratory section which will give hands-on practice with the concepts presented in lecture. Optional review sessions will be scheduled during the semester as the need arises.

### 5 Reading Materials

We will not be using a textbook in CS230 this semester. You should plan on taking good notes during lecture. Supplementary notes will occasionally be handed out.

Although there is no required textbook, you are encouraged to consult textbooks on Java and/or data structures on a frequent basis. A valuable on-line resource is Allen Downey's *How to Think Like a Computer Scientist: Java Version*, which can be found at

<http://www.ibiblio.org/obp/thinkCSjav/>

and is also linked from the *Resource Links* section of the CS230 home page.

The CS111 student lounge in SCI 173 (which is open 24/7) contains a large number of textbooks on data structures in Java that you are encouraged to borrow (but please do not remove them from the first floor of the Science Center!). Here is a list of some of the books available in the SCI 173 library

- Duane Bailey, *Java Structures*, McGraw Hill, 1999.
- Timothy Budd, *Classic Data Structures in Java*, Addison Wesley, 2001.

- Frank M. Carrano and Janet J. Prichard *Data Abstraction and Problem Solving with Java: Walls and Mirrors*, Addison Wesley, 2002.
- William J. Collins, *Data Structures and the Java Collections Framework*, McGraw Hill, 2002.
- Michael T. Goodrich and Roberto Tomassia, *Data Structures and Algorithms in Java*, John Wiley & Sons, Inc., 1998.
- Robert Lafore, *Data Structures & Algorithms in Java*, Waite Group Press, 1998.
- Michael Main, *Data Structures & Other Objects Using Java*, Addison-Wesley, 1999.
- Glenn W. Rowe, *An Introduction to Data Structures and Algorithms with Java*, Prentice-Hall Europe, 1998.
- Sartaj Sahni, *Data Structures, Algorithms, and Applications in Java*, McGraw-Hill, 2000.
- Thomas Standish, *Data Structures in Java*, Addison-Wesley, 1998.
- Mark Allen Weiss, *Data Structures & Problem Solving Using Java*, Addison-Wesley, 1998 (1st edition) 2002 (2nd edition)

## 6 Assignments

### 6.1 Problem Sets

There will be weekly problem sets in which you will write Java programs that illustrate concepts discussed in class. Many of the assignments will be challenging. Keep in mind that programming often consumes more time than you think it will. Start your assignments early! This will give you time to think about the problems and ask questions if you hit an impasse. Waiting until the last minute to begin an assignment is a recipe for disaster.

All assignments are due in class on the advertised due date, which will typically be a Thursday. You should turn in both a “hard” (paper) copy of your assignment and a “soft” (electronic) copy of any programs from the assignment. Soft copies should be submitted to your drop folder for assignments, which can be found at:

`puma.wellesley.edu:/home/cs230/drop/assignment-number/your-name.`

The soft copy submission will typically be a folder containing your programs and any other information you think is appropriate.

Assignments will be graded on a 100 point scale. I will try to have assignments graded as soon as possible. Solutions to assignments will be posted on the web.

### 6.2 Problem Set Header Sheets

I would like to get a sense for how much time it takes you to do your CS230 problem sets. Please keep track of the time you spend on each problem of your problem sets, and include this information on the problem set header sheets that will be provided for each problem set. Turn in this header sheet as the first page of your hardcopy solutions.

### 6.3 Late Problem Set Policy

I realize that it is not always possible to turn in problem sets on time. On the other hand, turning in one problem set late can make it more difficult to turn in the next problem set on time. I have decided on the following policy for this course this term:

A problem set due on a particular day will be accepted until 11:59pm of that day without penalty. A problem set can be turned in  $n$  days late if it is accompanied by  $n$  Lateness Coupons.

At the end of this handout, you will find a sheet with ten Lateness Coupons that you can use throughout the term. Use them wisely: you only get ten, and they are not copyable or transferable between students. Lateness Coupons can only be used on problem sets; they cannot be used on exams.

You may turn in late problem sets by slipping them under my office door. Of course, if I hand out solutions before you turn in a late problem set, you are bound by the Honor Code not to examine these solutions.

In extenuating circumstances (e.g., sickness, personal crisis, family problems), you may request an extension without penalty. Such extensions are more likely to be granted if there are made before the due date.

### 6.4 Collaboration Policy

I believe that collaboration fosters a healthy and enjoyable educational environment. For this reason, I encourage you to talk with other students about the course and to form study groups. Unless otherwise instructed, feel free to discuss assignments at a high level with other students and exchange ideas about how to solve the problems.

However, there is a thin line between collaboration and plagiarizing the work of others. Therefore, unless otherwise instructed,

**you must compose your own solution to each assignment.**

In particular, while you may discuss strategies for approaching the programming assignments with your classmates and may receive high-level debugging help from them,

**you are required to write and debug all Java code completely on your own.**

It is **unacceptable** (1) to write any Java code together and turn in two copies of the same code; (2) to copy any code written by your classmates or students from previous semesters; (3) to copy any solution code written by the instructors from this semester or previous semesters; or (4) to give or receive help involving debugging a particular Java program<sup>1</sup>. However, it is OK to borrow code from the textbooks, from materials discussed in class, and from other sources as long as you give proper credit.

In keeping with the standards of the scientific community,

**you must give credit where credit is due.**

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<sup>1</sup>It's OK to ask fellow students what the likely cause of particular error message is. And it's OK to receive help from the instructors at any time. What's not OK is to have another student peering at your code over your shoulder helping you to debug it.

If you make use of an idea that was developed by (or jointly with) others, please reference them appropriately in your work, e.g., if person  $X$  gets a key idea for solving a problem from person  $Y$ , person  $X$ 's solution should begin with a note that says "I worked with  $Y$  on this problem" and should say "The main idea (due to  $Y$ ) is ...". It is **unacceptable** for students to work together but not to acknowledge each other in their write-ups.

When working on assignment problems, it is perfectly reasonable to consult public literature (books, articles, etc.) for hints, techniques, and even solutions. However, you must reference any sources that contribute to your solution. **Assignments and solutions from previous terms of CS230 are *not* considered to be part of the "public" literature.** You must refrain from looking at any solutions from previous terms of CS230. **It is my policy that consulting assignment solutions from previous terms constitutes a violation of the Honor Code.**

Despite the existence of the Honor Code, we have had trouble with students following the above policies in the past. To remind you of these policies, we will ask you to sign each problem set and exam header sheet saying that you have followed the policies expressed above. Keep in mind that violating the policies can lead to a serious penalty. Violators from previous semesters have asked us to sternly warn you that if the General Judiciary finds you guilty of violating the policy on even a single problem set, it can lead to a zero score for the *entire* problem set component of your grade, which results in a failing grade in the course.

## 6.5 Extra Credit

To make up for points lost on problem sets and exams, students often request extra credit problems. In order to give everyone the same opportunity, I will sometimes include extra credit problems on the problem sets. The extra credit problems will often be more difficult than the other problems, but they provide the opportunity to earn extra points toward your course grade. You should only attempt extra credit problems after completing the assigned problems.

Extra credit problems are entirely optional. Extra credit points will only be factored into course grades after I have partitioned the grade scale into letter grades. Thus, doing the extra credit problems may raise your course grade, but not doing extra credit problems will not lower your course grade.

For maximum flexibility, you may turn in extra credit problems at any time during the term (through the end of finals week). However, experience has shown that students who leave extra credit problems until the end of the term rarely turn them in. It is in your best interest to complete extra credit problems in a timely fashion. I will not hand out solutions to extra credit problems, but you are encouraged to discuss them with me in person.

## 6.6 Programming

All programming in this course will be done using Java on the Linux platform. You will edit programs using the Emacs editor. Details on Linux, Emacs, and using Java in Linux are provided in Handout #3.

The "default" place for you to work on your assignments will be at the CS Department's Linux workstations in the mini-mini-Focus. **In order to use the Linux workstations, you will need a Linux account. If you do not already have one, please ask Lyn to create one for you.**

If you desire, you are welcome to install Linux on your own computer so that you can use it for your CS230 work. However, many students prefer to work directly at the Linux workstations since there are likely to be other CS230 students working there, increasing the probability of collaboration.

## 6.7 Saving Work

You have a limited amount of space on the CS department fileserver (`puma.wellesley.edu`) to store your course-related files.

Make backups (onto a Zip disk or the hard disk of your own computer) of all your work throughout the semester. In the past, numerous students have lost all of their work when they could least afford it. Don't join them!

Removable disks are a frail medium that you should handle carefully. Store and transport them in suitable protected containers. Do not subject them to temperature extremes, put them near magnetic fields, store them unprotected in your pockets, etc. Even if you handle zip disks carefully, they are still prone to failure.

While planning your computer usage, keep in mind that computers do break down and Wellesley's are no exception.

## 7 Exams

There will be three CS230 exams, all open book and open notes:

- A take-home exam that will be posted on Thursday, October 3 and will be due by 11:59pm on Thursday, October 10.
- A take-home exam that will be handed out on Thursday, November 14 and will be due by 11:59pm on Monday, November 25.
- A final exam during the regular exam period.

Please mark these dates in your calendars. If you have any conflicts regarding the exam dates, you must contact your instructor as soon as possible.

The take-home exams will be similar to problem sets and will require use of a computer. **You are not allowed to collaborate with anyone else or receive any help from the instructors on any of the exams.**

## 8 Grades

The course grade will be computed as shown below:

Problem sets (total)	40%
Exam 1	20%
Exam 2	20%
Final exam	20%

The default ranges for grades are expressed as a percentage of total points (excluding extra credit points):

A	93.33 – 100
A-	90 – 93.32
B+	86.66 – 89.99
B	83.33 – 86.65
B-	80 – 83.32
C+	76.66-79.99
C	73.33-76.65
C-	70 – 73.32
D	60 – 69.99
F	below 60

I reserve the right to lower boundaries between grades, but I will not raise them. This means that I can grade on a curve, but only in your favor.

The above information is intended to tell you how I grade. It is not intended to encourage a preoccupation with point accumulation. You should focus on learning the material; the grade will take care of itself. If you are dissatisfied with the grade you will receive based on the above scale, I encourage you to turn in extra credit problems to raise your grade.

## 9 Course Web Pages, Directories, and Conferences

All handouts and various course-related links can be found on the CS230 home page at the following URL:

<http://puma.wellesley.edu/~cs230>.

The CS230 course directory is located on [puma.wellesley.edu](http://puma.wellesley.edu) in the directory `/home/cs230`. This directory contains material relevant to the class, and is where the problem set drop folders are located. From Linux FTP, Fetch, or Winsock-FTP, the CS230 directory can be accessed by connecting to [puma.wellesley.edu](http://puma.wellesley.edu) and navigating to `/home/cs230`.

Additionally, there is a CS230-F02 conference in FirstClass with two subconferences:

- CS230-F02 **Announcements** will be used to make class announcements, such as corrections to assignments and clarifications of material discussed in class.
- CS230-F02 **Q&A** is a forum for you to post questions or comments. They will be answered by me or a classmate. This is also a good place to find people to form a study group.

You should plan on reading the CS230 conferences on a regular basis. It is strongly recommended that you add both subconferences to your FirstClass desktop.

## 10 Finding Help

If you have any questions at all about the class (whether big or small, whether on problem sets lectures, reading, or whatever) please contact Lyn or Stella. **That's what we're here for!**

The best time to see us is during our scheduled office hours (which are listed at the top of this handout). If these times are not convenient, we can set up an appointment at some other time. You can set up an appointment by talking with us in person, calling us on the phone, or sending us email.

A drop-in tutors will be available to answer your questions during certain hours. The name and schedule of the drop-in tutor will be made available early in the term.

If you are having trouble with the course, you can request a one-on-one tutor from the Learning and Teaching Center (LTC). This service is confidential and free of charge; please take advantage of it if you would like some extra help! Contact the instructors or LTC for more information about this service.

Finally, when looking for help, don't overlook your fellow students — not only those who have taken the course in the past, but your classmates as well. Your classmates are a valuable resource; make good use of them!

## **11 Students With Special Needs**

If you have any disabilities (including “hidden” ones, like learning disabilities), I encourage you to meet with me so that we can discuss accommodations that may be helpful to you.

## LATENESS COUPONS

Below are ten Lateness Coupons. A problem set that is  $n$  days late must be accompanied with  $n$  Lateness Coupons in order to be accepted. That is, each coupon gives you one extra day to turn in a problem set. You may use them in any manner in which you wish – e.g., turn in every problem set one day late, or turn in one problem set ten days late. Lateness coupons are not transferable between students, and may not be used on exams.

<b>CS230 Lateness Coupon #1</b>
<b>CS230 Lateness Coupon #2</b>
<b>CS230 Lateness Coupon #3</b>
<b>CS230 Lateness Coupon #4</b>
<b>CS230 Lateness Coupon #5</b>
<b>CS230 Lateness Coupon #6</b>
<b>CS230 Lateness Coupon #7</b>
<b>CS230 Lateness Coupon #8</b>
<b>CS230 Lateness Coupon #9</b>
<b>CS230 Lateness Coupon #10</b>