Syllabus

—— Data Structures and Advanced Programming ——

Section 01 Instructor	Prof. Kelly Shaw
Office	Thompson Chemistry 308
Email	kas10@cs.williams.edu
Office Hours	Mon 3:15-4:45pm, Thu 4:15-5:15pm, or by appointment
Section 02 Instructor	Prof. Daniel Barowy
Office	Thompson Physics 306
Email	dbarowy@cs.williams.edu
Office Hours	Tue 1:00-2:30pm, Wed 3:00-4:00pm, or by appointment
Lab Instructor	Lida Doret
Office	Thompson Chemistry 205
Email	lpd2@williams.edu
Lectures	MWF 10:00-10:50am (Section 01; Shaw) in Wachenheim 114
	MWF 9:00-9:50am (Section 02; Barowy) in Wachenheim 114
Labs	W 1:00-2:30pm (Section 03; Shaw) in TCL 217
	W 2:30-4:00pm (Section 04; Shaw) in TCL 217
	Th 1:00-2:30pm (Section 05; Barowy) in TCL 217
	Th 2:30-4:00pm (Section 06; Barowy) in TCL 217
	Labs are due weekly on Tuesday before 10pm
Web Page	https://www.cs.williams.edu/~cs136

—— Texts ——

We will be using the $\sqrt{7}$ edition the following text book:

- *Java Structures: Data Structures in Java for the Principled Programmer, $\sqrt{7}$ Edition*, by Duane Bailey.

Do not use earlier editions! A PDF version is available on the course website. We have also printed copies if you prefer a physical textbook.

—— Course Objectives ——

Goal. The goal of this course is to enable you to write good programs. Throughout the semester, you will develop both an analytical and intuitive understanding of what we mean by "good" in computer science. In a typical week, you will design, analyze, code, and verify that your programs work as expected.

Data structures. We study data structures in this course. A data structure is a foundational concept for understanding the efficient storage and manipulation of data. Data structures and algorithms (which you will study in CS256) are two sides of the same coin. Both are essential for the construction of the kinds of large, reliable computer programs used by billions of computers users on a daily basis.

Java. We will be using the Java programming language for this course. Unlike Python, Java is augmented with a number of features that address the challenges of writing large-scale programs (e.g., static types). Learning these features will require some effort. However, developing a fluency in Java will benefit not just your performance in this class, but your abilities as a programmer in the future.

The elements of style. In addition to learning how to write <u>correct</u> and <u>fast</u> programs, a major emphasis of this course is learning how to write code in a <u>clear</u> and <u>modular</u> manner. Programs written and documented clearly are easier to maintain and result in fewer bugs. Modular code substantially reduces coding effort and also results in fewer bugs. Don't be surprised if you receive feedback that your program needs work even when it correctly implements an assignment's specification.

Lab resources. This course will primarily use the MacOS computers in TCL 216 & 217 for programming assignments. You will be given door codes to access these rooms once the semester begins. While you are permitted to use your own computer if you wish, we only guarantee support for the lab environment, and all submitted assignments will be graded using the lab environment.

Typical Course Activities

Workload. The work that you should expect to engage with, beyond the scheduled lectures and weekly lab meetings, will involve

- Reading the text: 12–15 pages, on average, <u>per lecture</u>
- Preparing for quizzes
- Preparing for the weekly programming labs
- Completing the weekly labs
- Studying for the mid-term and final exam

Some students program quickly but read slowly, and some do the converse. You should expect to spend <u>at least 10 hours a week beyond the scheduled lecture and lab hours</u> on this course. If you find yourself spending substantially more time than that on a regular basis, please speak with a course instructor.

Quizzes. There will be one graded quiz at the end of each week. To prepare you for these quizzes, we will practice important concepts using group activities earlier in the week. Activities will typically be on Monday, while graded quizzes will typically be on Friday. <u>There will be no make-up quizzes.</u>

Labs. On most weeks, there will be lab programming assignments. **Attendance in lab is mandatory**: there are valid reasons to miss lab, but **any unexcused lab absence is grounds for course failure**. All programs will be graded on the basis of <u>design</u>, <u>documentation</u>, <u>style</u>, <u>correctness</u>, and <u>efficiency</u>. Programs should be turned in electronically by 10:00pm on the due date, typically the Tuesday following your lab meeting.

Exams. There will be one midterm and one final exam. The midterm will be held during your scheduled lab period during the week of **October 24**, and it will replace the lab for that week. The final exam is a scheduled exam during the college's exam period. The registrar will notify us with a date once they finalize the exam schedule.

Gitlab

All assignments for this course will be submitted using Gitlab. Prior to an assignment, a Gitlab repository will be created for you. Repository names generally conform to the following pattern: `https://evolene.cs.williams.edu/cs136-labs/<yourcsusername>/lab<n>-<labname>.git`. You will be notified by email when your Gitlab repository is created.

Late Work and Resubmissions

Late Work. You are expected to turn in all assignments in a timely manner receive full credit. Please contact us <u>ahead of time</u> to discuss the matter if you foresee issues that prevent timely submission. Without prior arrangement, late assignments will be penalized at a rate of **20% per day**.

Resubmissions.   The assignments in this course are designed to challenge students. You may find that occasionally, you do not do as well on an assignment as you had hoped. To encourage you to revisit and master this material, we allow **up to two assignment resubmissions** during the semester. This policy includes labs 1–9 and the midterm exam, but not the final lab or final exam.

A resubmission allows you to earn back **up to 50% of the missing points**. For example, if you received a 75% on an assignment, you may earn up to 87.5% upon resubmission.

Resubmissions must be submitted in the following manner:

1. They must be submitted before the end of the final exam reading period.
2. They must include both the original work and the new submission.
3. They must be accompanied with a typed document, written in plain language, that explains, for every misunderstanding:

   (a) what the error is in the original work,
   (b) how you fixed the error, and
   (c) why the new version is correct.

We will provide specific resubmission instructions for each kind of assignment later in the semester.

Grades

Grades will be determined as follows:

Final exam:	25%
Midterm exam:	25%
Programs/Labs:	30%
Attendance:	10%
Quizzes:	10%

COVID-19

We consider **your health to be your top priority**. Falling ill is not your fault, and your grade should not suffer as a result. If you contract COVID-19, please inform us as soon as possible. Should you fall ill, you may continue participating in the class remotely if you feel healthy enough to do so. If you do not feel healthy, consider your semester as "on hold" with no negative consequences. In coordination with the college deans, we will revisit your academic plan once you regain your health.

Help!!!

There are many resources available when you need it. You are encouraged to discuss any questions, concerns, difficulties, or thoughts about the course with your instructors (Dan, Kelly, and Lida). In addition, TAs are available to help you with challenges you face as you work through the course material and lab assignments. You are welcome at any time to approach course staff to ask for clarification of the assignments, and to discuss your problem-solving process. You do not need to wait until you are stuck and frustrated to speak with us!

If you find yourself facing challenges beyond the typical, please do not stay silent. We ask that you reach out to us for help. If you are uncomfortable speaking with us, we recommend that you seek out a friendly face from the Dean's Office, or one of the many professionals across campus who stand ready to help. All faculty and staff at Williams are bound by the Family Educational Rights and Privacy Act (FERPA) to maintain the privacy of your educational records. We understand that difficulties arise, and we are prepared to help you.

Contrary to popular belief, the most successful students are not effortlessly successful. Instead, they get to know course staff early on and they familiarize themselves with their institution's academic support resources. Williams has ample support resources, including

- The Peer Tutor Program: Tutors can be arranged when 1-on-1 help is required beyond that available from your instructor and TAs. `https://academic-resources.williams.edu/peer-tutor-program/`

- Math & Science Resource Center: Support is available for students grappling with the more quantitative aspects of their coursework. `https://academic-resources.williams.edu/math-science/`

- Accessible Education and Disability Support Center: Students with documented disabilities may require accommodations in certain situations. `https://academic-resources.williams.edu/disabilities/`

- The Health Center: Sometimes your challenges are not course-related. The Health Center provides a range of medical, psychological, and health/wellness services. `https://health.williams.edu`

There is never any penalty for seeking help!

Inclusivity

The Williams community embraces diversity of age, background, beliefs, ethnicity, gender, gender identity, gender expression, national origin, religious affiliation, sexual orientation, and other visible and nonvisible categories. We welcome all students in this course and expect that all students contribute to a respectful, welcoming and inclusive environment. If you feel that you are not being welcomed, included, or accepted in this class, please come to us or a college administrator to share your concern. You may be surprised to learn that we both have these conversations with students regularly and even welcome them. Please let us know how we can support you!