# CSCI 261: Computer Science II

## Course Syllabus – Fall 2022

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**Office:** Thompson Hall 303
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**Lecture Meeting Times:** Mon/Wed/Fri 11:00a - 11:50a in TH 399
**Lab Meeting Times:** Tue 11:00am - 12:50am in TH 409
**Final Exam:** Wed, 12/14/2022, 12:00p - 2:00p
**Office Hours (On Zoom - See canvas for link):**

- Mon/Wed/Fri 4:00p - 5:00p
- Tue 3:00p - 5:00p
- By appointment

# 1 Course Information

This course is a continuation of the topics introduced in CSCI 161. It provides an introduction to the study of fundamental data structures and their associated algorithms. Students will learn about lists, stacks, queues, trees, sorting, searching, abstract data types, and object-oriented programming using Java, and learn how to choose appropriate data structures and algorithms for particular problems.

## Prerequisites

A grade of C- or higher in the following course is required, or with permission from the instructor:

- *CSCI 161 - Introduction to Computer Science*

Students with transfer credit for CSCI 261 may not take this course.

## Textbook

- Koffman and Wolfgang. Data Structures: Abstraction and Design Using Java. 2nd edition or higher. **(Required)**

## Course Topics

- Advanced object-oriented design: inheritance and polymorphism
- Exception handling
- Basic principles of complexity analysis and the big-$O$ notation
- Recursion and recursive data structures
- Data structures and associated operations (including lists, queues, stack, trees, and maps)
- Sorting algorithms

### Student Learning Outcomes

Upon completion of this course, students will be able to:

- Design and implement reasonably sized Java programs from scratch, maximizing code reuse.
- Gracefully handle error-reporting in Java programs.
- Analyze an algorithm using big-$O$ notation.
- Make informed decisions on choosing an appropriate data structure for a given task by understanding their tradeoffs and considering their performance in the common case.

## 2 Grading

The following grade cutoffs are upper bounds. They might come down, but will not be set higher: A = 95, A- = 90, B+ = 87, B = 83, B- = 80, C+ = 77, C = 73, C- = 70, D+ = 67, D = 64, D- = 60, F = $<$ 60. Your overall grade will be composed as follows:

| | **% Weight** |
|---|---|
| Discretionary | 2 |
| Lab Assignments | 10 |
| Homework Assignments | 38 |
| Midterm I | 15 |
| Midterm II | 15 |
| Final Exam | 20 |

Table 1: Breakdown of Grades

### Assignments

- **Labs (Paired)** – You will pair up with another student and switch roles throughout the lab. Lab assignments are downloadable from the class page and are always due the next day 11:59p. Labs are graded on a 2/1/0 point scale, based mainly on attendance and effort. 2 = attended on-time and completed, 1 = attended late or incomplete, 0 = did not attend or minimal effort.

  Labs are meant to be a relaxed, low-stakes, and interactive environment to learn the week's materials. As long as you're not a distraction, you are welcome to move around and talk amongst yourselves. Refrain from working on assignments or doing other activities unrelated to this course. It goes without saying, *stay off your phones*.

- **Homework Assignments** – Programming assignments account for a significant portion of the final grade. Homework assignments are to be completed individually unless otherwise stated. While you are encouraged to help each other and share ideas, please note that copying any code from outside sources (e.g., other students, former students, web sites) prohibited and considered plagiarism and will induce heavy penalties (refer to *Academic Integrity* below). When in doubt, ask me if a certain activity is allowed!

  There may be a few assignments that require team work. The most successful teams meet and physically work together at an agreed-upon location and time – that is, *uno animo*, like you do in Labs.

Teams that delegate tasks independently (then merging tasks later) are likely to struggle. Each member of the team should contribute equally to the assignment, and every student in a team will receive the same grade.

- **Late Work and Extensions** – For each day either a homework assignment is late (includes weekends), a $\lceil 3^d \rceil\%$ deduction, where $d$ is the number of days late, will be assessed. Because ample amounts of time are provided to complete each assignment (usually around 2 weeks) no extensions be will given for homework assignments, unless there are unique circumstances or accommodations. Because labs are always due the next day and are graded on attendance and effort, there is no extension for labs.

### Exams

There will be two midterms and a final exam. They will cover topics discussed in the lectures, readings from the assigned textbook, and assignments. The exams are cumulative. Study guides are provided and selected problems are reviewed on the lecture preceding the day of the exam. You are allowed a calculator and a page of notes (front and back) on all exams.

### Discretionary

Discretionary points will be given based on:

- Lecture and lab attendance and showing up on time
- Classroom participation
- Refraining from activities that can disrupt others, *e.g.*, texting, playing games on your laptop, *etc*.

## 3 Course Policies

### Laptops and Phones

**Laptops:** Laptop computers have proved to be a distraction in my lectures. Except on lab days and for those who can provide documentation of need from the office of Student Accessibility and Accommodation (SAA), please don't bring your laptops to lectures. **Phones:** Please put your phones on silent during class.

### Academic Integrity

You should be aware of the *Student Integrity Code* at the university. Any suspected cheating (*e.g.*, plagiarizing code, copying homework solutions, etc.) will be reported to the Registrar, which may result in possible suspension/expulsion. See this link for more info:
http://www.pugetsound.edu/student-life/personal-safety/student-handbook/academic-handbook/academic-integrity

### Student Accessibility and Accommodation

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.

### Classroom Emergency Response Guidance

Please review university emergency preparedness and response procedures posted at . 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.

### Student Bereavement Policy

The University of Puget Sound recognizes that a time of bereavement can be difficult for a student. Therefore, the university provides a Student Bereavement Policy for students facing the loss of a family member. Students are normally eligible for, and faculty members are expected to grant, three consecutive weekdays of excused absences, without penalty, for the death of a family member, including parent, grandparent, sibling, or persons living in the same household. Should the student feel that additional days are necessary, the student must request additional bereavement leave from the Dean of Students or the Dean's designee. In the event of the death of another family member or friend not explicitly included within this policy, a bereaved student may petition for grief absence through the Dean of Students office for approval.

### Student Religious Accommodation

The university provides reasonable religious accommodations for academic courses and programs, and the university policy is found at:
https://www.pugetsound.edu/about/offices-services/human-resources/policies/campus-policies/student-religious-accommodations-in-academic-courses-or-programs.

## 4 Course Schedule

The following course schedule is tentative and subject to change.

| Week | Topics | Reading |
|---|---|---|
| 1 | Inheritance | K&W: Chap 1 and my notes |
| 2 | Polymorphism and subtyping | K&W: Chap 1 K&W: Chap 1 |
| 3 | Abstract classes and interfaces | K&W: Chap 1 K&W: Chap 1 |
| 4 | Exception handling | K&W: Chap 2.1 |
| 5 | Big-O notation | K&W: Chap 2.2-2.4 |
| 6 | *Review and Midterm I* | — |
| 7 | List | K&W: Chap 4.1-4.4 |
| 8 | Queue and Stack | K&W: Chap 4.5-4.7. Start Chap 5.1-5.2 |
| 9 | Recursion | K&W: Chap 5.3-5.5; Start Chap 6.1-6.3 |
| 10 | Binary Tree, BST | K&W: Chap 6.2, 6.4 |
| 11 | *Review and Midterm II*, Heaps | K&W: Chap 7.2 |
| 12 | HashMap | K&W: Chap 8.1-8.3 |
| 13 | *Thanksgiving Break*; | — |
| 14 | Sorting | K&W: Chap 8.4, 8.6, 8.9 |
| 15 | *Review and reading period* | — |