



**Course Name:** Data Structures

**Course Number:** CS 261 (Section 400 & 401)

**Credits:** 4

**Instructor names:** Laurel Hopkins & Samina Ehsan

**Instructor emails:** [hopkilau@oregonstate.edu](mailto:hopkilau@oregonstate.edu) & [ehsans@oregonstate.edu](mailto:ehsans@oregonstate.edu)

## Course Description

Abstract data types, dynamic arrays, linked lists, trees and graphs, binary search trees, hash tables, storage management, complexity analysis of data structures. Lec/rec.

**Prerequisites:** (CS 162 with C or better or CS 165 with C or better) and (CS 225 [C] or MTH 231 [C])

## Course Format

This course will be delivered via Canvas, Slack, and Piazza, your online learning community, where you will interact with your classmates and with the instructors and TAs. section may be required to interact with teachers, teaching assistants, and students in other concurrent sections of this same course. Within the course site you will access the learning materials, tutorials, and syllabus; discuss issues; submit assignments; take quizzes; email other students and the instructor/TAs; participate in online activities; and display your projects.

- **Slack Workspace:** class-cs261-400/401-s20
- **Piazza forum:**  
[https://piazza.com/oregonstate/spring2020/cs\\_261\\_400\\_401\\_s2020/](https://piazza.com/oregonstate/spring2020/cs_261_400_401_s2020/)
- To preview how an online course works, visit the Ecampus course demo:  
<https://ecampus.oregonstate.edu/course-demo/>

## Communication

Please post all course-related questions on our Piazza forum so that the whole class may benefit from our conversation. Please contact instructors privately for matters of a personal nature. We will do our best to reply to course-related questions within 48 hours (responses may take longer over the weekend). We will strive to return your assignments and grades for course activities to you within 7 days of the due date.

## Course Credits

This course combines approximately 120 hours of instruction, online activities, and assignments for 4 credits.

## Technical Assistance

If you experience errors or problems while in your online course, contact 24-7 Canvas Support through the Help link within Canvas. If you experience computer difficulties, need help downloading a browser or plug-in, or need help logging into a course, contact the IS

Service Desk for assistance. You can call (541) 737-8787 or visit the [IS Service Desk](https://oregonstate.teamdynamix.com/TDClient/Requests/ServiceDet?ID=22911) online: <https://oregonstate.teamdynamix.com/TDClient/Requests/ServiceDet?ID=22911>

## Course Learning Objectives

At the completion of the course, students will be able to...

1. **Describe** the properties, interfaces, and behaviors of basic abstract data types, such as collection, bag, indexed collection, sorted collection, stack, and queue.
2. **Read** an algorithm or program code segment that contains iterative constructs and **analyze** the asymptotic time complexity of the algorithm or code segment.
3. **State** the asymptotic time complexity of the fundamental operations associated with a variety of data structures, such as vector, linked list, tree, and heap.
4. **Recall** the space utilization of common data structures in terms of the long-term storage needed to maintain the structure, as well as the short-term memory requirements of fundamental operations, such as sorting.
5. **Design** and **implement** general-purpose, reusable data structures that implement one or more abstractions.
6. **Compare** and **contrast** the operation of common data structures (such as linear structures, priority queues, tree structures, hash tables, maps, and graphs) in terms of time complexity, space utilization, and the abstract data types they implement.

## Learning Resources

There is no required textbook for this course. Reading and learning materials are provided via Canvas. However, you may wish to reference the optional online textbook listed below.

- "Open Data Structures" by Pat Morin <https://opendatastructures.org/ods-python/>

## Evaluation of Student Performance

Scores for the quiz and programming assignments will be posted on Canvas as they are graded. If you want to know your grade, use the following weights.

- 1% – Syllabus Quiz
- 99% – Programming Assignments

## Programming Assignments (99%)

There are a total of 5 programming assignments to be completed for this course.

- Assignments include writing a computer program and sometimes written answers to questions.
- Assignments are to be turned in **before 23:59** on the date they are due.
- Programs are evaluated on how well they solve the assigned problem.. Assignments will be turned in via Canvas or Gradescope. Assignment descriptions will specify the turn in method. Typically written answers go to Canvas and programming assignments go to Gradescope.
- If you have a problem with an assignment grade, you must contact the teaching assistant who graded your assignment, through EMAIL within **one week** of receiving your grade. No grade will be updated after that period. **Please note that, near the end of the term, there may not be a full week between when your**

**assignment is returned and the last day of the term. We may not be able to address grading concerns after the term has ended.**

### **Letter Grade**

We will use the following grading structure to calculate your final grade.

<b>Grade</b>
100 $\geq$ A $\geq$ 92.5
92.5 $>$ A- $\geq$ 89.5
89.5 $>$ B+ $\geq$ 86.5
86.5 $>$ B $\geq$ 82.5
82.5 $>$ B- $\geq$ 79.5
79.5 $>$ C+ $\geq$ 76.5
76.5 $>$ C $\geq$ 72.5
72.5 $>$ C- $\geq$ 69.5
69.5 $>$ D+ $\geq$ 66.5
66.5 $>$ D $\geq$ 62.5
62.5 $>$ D- $\geq$ 59.5
59.5 $>$ F

**\*\*REMINDER:** A passing grade for core classes in CS is a C or above. A C- (below 72.6) is not a passing grade for CS majors.

## **Course Policies**

### **Late Work Policy**

You can turn in one assignment late (up to 2 days) without any penalty. 15% deduction for each day late policy will be applied to your second late submission and so forth. Any assignment that is submitted after the 48 hours late window will not be graded, hence you will receive 0 points.

### **Incompletes**

In this online program, there will rarely be cases where an incomplete is appropriate. The instructor will only consider giving an incomplete grade for emergency cases such as a death in the family, major disease, or child birth, while also having completed at least 60% of all coursework. If you have a situation that may prevent you from completing the coursework, let the instructor know as soon as you can.

*(Writing attribution: CS 162 instructor Joseph Jess)*

### **Guidelines for a Productive and Effective Online Classroom**

Students are expected to conduct themselves in the course (e.g., on discussion boards, email) in compliance with the university's regulations regarding civility. Civility is an essential ingredient for academic discourse. All communications for this course should be conducted constructively, civilly, and respectfully. Differences in beliefs, opinions, and

approaches are to be expected. In all you say and do for this course, be professional. Please bring any communications you believe to be in violation of this class policy to the attention of your instructor.

Active interaction with peers and your instructor is essential to success in this online course, paying particular attention to the following:

- Unless indicated otherwise, please complete the readings and view other instructional materials for each week before participating in the discussion board.
- Read your posts carefully before submitting them.
- Be respectful of others and their opinions, valuing diversity in backgrounds, abilities, and experiences.
- Challenging the ideas held by others is an integral aspect of critical thinking and the academic process. Please word your responses carefully, and recognize that others are expected to challenge your ideas. A positive atmosphere of healthy debate is encouraged.

### **Statement Regarding Students with Disabilities**

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval, please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

### **Expectations for Student Conduct**

Student conduct is governed by the university's policies, as explained in the [Student Conduct Code](#). Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the university's regulations regarding civility.

### **Academic Integrity**

The Code of Student Conduct prohibits Academic Misconduct and defines it as:

*Any action that misrepresents a student or group's work, knowledge, or achievement, provides a potential or actual inequitable advantage, or compromises the integrity of the educational process.*

To support understanding of what can be included in this definition, the Code further classifies and describes examples of Academic Misconduct, including cheating, plagiarism, assisting and others. See the [Code of Student Conduct](#) for details.

You are expected to do your own work and demonstrate academic integrity in every aspect of this course. Familiarize yourself with the standards set forth in the OSU Code of Student Conduct Section 4.2. You must only access sources and resources authorized by the instructor. You may not show your work to any other current or future students without the instructor's authorization. Violations of these expectations or the Code of Student Conduct

will be reported to the Office of Student Conduct and Community Standards. If there is any question about whether an act constitutes academic misconduct, it is your responsibility to seek clarification and approval from the instructor prior to acting.

### **Conduct in This Online Classroom**

Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the [university's regulations regarding civility](http://oregonstate.edu/admin/stucon/regs.htm) (<http://oregonstate.edu/admin/stucon/regs.htm>). Students will be expected to treat all others with the same respect as they would want afforded themselves. Disrespectful behavior to others (such as harassing behavior, personal insults, inappropriate language) or disruptive behaviors in the course (such as persistent and unreasonable demands for time and attention both in and out of the classroom) is unacceptable and can result in sanctions as defined by Oregon Administrative Rules [Division 015 Student Conduct Regulations](http://oregonstate.edu/studentconduct/code/index.php) (<http://oregonstate.edu/studentconduct/code/index.php>).

*(Adapted from statements provided by Becky Warner, SOC)*

### **Ground Rules for Online Communication & Participation**

- *Online threaded discussions* are public messages, and all writings in this area will be viewable by the entire class or assigned group members. If you prefer that only the instructor sees your communication, send it to me by email, and be sure to identify yourself and the class.
- Posting of personal contact information is discouraged (e.g. telephone numbers, address, personal website address).
- *Online Instructor Response Policy*: We will check email frequently and will try to respond to course-related questions within 48 hours (responses may take longer over the weekend).
- *Observation of "Netiquette"*: All your online communications need to be composed with fairness, honesty, and tact. Spelling and grammar are very important in an online course. What you put into an online course reflects on your level of professionalism.
- Here are a couple of references that discuss
  - writing online: <http://goto.intwg.com/>
  - netiquette: <http://www.albion.com/netiquette/corerules.html>
- Please check the Announcements area and the course syllabus before you ask general course "housekeeping" questions (i.e. how do I submit assignment 3?). If you don't see your answer there, then please contact the instructor.

*(Adapted from Jean Mandernach, PSY)*

### **Guidelines for a Productive and Effective Online Classroom**

- Piazza and Slack are your spaces to interact with your colleagues related to current topics or responses to your peers' statements. It is expected that each student will participate in a mature and respectful fashion.
- Participate actively in the discussions, having completed the readings and thought about the issues.

- Pay close attention to what your classmates write in their online comments. Ask clarifying questions, when appropriate. These questions are meant to probe and shed new light, not to minimize or devalue comments.
- Think through and reread your comments before you post them.
- Assume the best of others in the class and expect the best from them.
- Value the diversity of the class. Recognize and value the experiences, abilities, and knowledge each person brings to class.
- Disagree with ideas, but do not make personal attacks. Do not demean or embarrass others. Do not make sexist, racist, homophobic, or victim-blaming comments at all.
- Be open to be challenged or confronted on your ideas or prejudices.

*(Adapted from a statement provided by Susan Shaw, WS)*

### **Tutoring and Writing Assistance**

[NetTutor](#) is a leading provider of online tutoring and learner support services fully staffed by experienced, trained and monitored tutors. Students connect to live tutors from any computer that has Internet access. NetTutor provides a virtual whiteboard that allows tutors and students to work on problems in a real time environment. They also have an online writing suite where tutors critique and return essays within 24 to 48 hours. Access NetTutor from within your Canvas class by clicking on the Tools button in your course menu.

The Oregon State [Online Writing Suite](#) is also available for students enrolled in Ecampus courses.

### **Student Evaluation of Courses**

The online Student Evaluation of Teaching system opens to students during the week before finals and closes the Monday following the end of finals. Students receive notification, instructions and the link through their ONID. They may also log into the system via Online Services. Course evaluation results are extremely important and used to help improve courses and the online learning experience for future students. Responses are anonymous (unless a student chooses to "sign" their comments, agreeing to relinquish anonymity) and unavailable to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.

### **Concluding Remark**

<p>"Get your data structures correct first and the rest of the program will write itself." —David Johnson</p>
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*Please take the above quote seriously.*