

---

# CS165 CS2: DATA STRUCTURES

## PREREQUISITES FOR COURSE

A grade of C or better in one of CS162, CS163, or CS164.

## COURSE DESCRIPTION & OBJECTIVES

Object oriented concepts, assertions, inheritance, polymorphism, algorithms and data structures using Java.

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

- Create recursive solutions using branching recursion
- Recognize the use of Object-Oriented Programming concepts in creating classes and objects.
- Write Black- and White-Box unit tests
- Add Java Generics to an existing data structure.
- Implement a Linked List and understand the advantages/disadvantages of the structure
- Create a Stack from scratch and use it to solve programming problems
- Recognize the various types of Queues (Queue, Dequeue, Priority) and implement each.
- Write a Regular Expression using PCRE syntax to match strings
- Convert expressions between prefix, postfix, and infix using an expression tree.
- Discover items using Binary Search Trees and B+ Trees.
- Use a hashing algorithm to implement a HashMap
- Select an appropriate Graph implementation and use a Graph to solve hard problems.

## TEXTBOOK / COURSE READINGS

The primary textbook for this course is a customized zyBook which includes chapters on Algorithms and Data Structures. To acquire this book, click through a zyBooks assignment on the Assignments tab in Canvas. Students wishing to opt out of Inclusive Access should contact the CSU Bookstore.

An optional resource is the Liang Java programming book.

## COURSE MATERIALS & EQUIPMENT

To turn in certain assignments, students may be required to scan a document or electronically edit a document to add their solution. It is the student's responsibility to acquire the hardware or software to be able to do this. Students are also required to have the required hardware and software to take the exams using the proctoring platform. This includes a webcam and microphone and, unfortunately, is only compatible with recent Windows and Macintosh operating systems.

## PARTICIPATION/BEHAVIORAL EXPECTATIONS

This is a 4-credit course. The University suggests that students should expect to work 2-3 hours in addition to class meeting time per credit hour. As this is an online class where you watch lecture videos and do lab discussions, it is expected that you will spend 12-16 hours each week on coursework. Some students may need more or less time.

Even though this is an online course, you are expected to interact with other students taking this class through online discussions. Online discussions are used for the Recitation and Worksheet portions of this course. You will post your answers in a comment and will then reply to two other student's responses to get full credit for the assignment.

Please review the [core rules of netiquette](#) for some guidelines and expectations on how to behave in an online learning environment.

## COURSE POLICIES (LATE ASSIGNMENTS, MAKE-UP EXAMS, ETC.)

This course is designed so that you can work ahead as modules are published. You can work ahead to future modules. However, there are due dates on each module, so you will have to keep up with the work. While you can get ahead, you cannot get too far behind. Exams and Worksheets don't have a late policy. Labs, Programming Assignments, and Homework Discussions have a one-week extension, except for the assignments in the last week of the course, which are due that week.

All make-up exams, assignments, extensions, or similar require written documentation from the appropriate university office. Please work with the appropriate office for your situation, such as the Student Disability Center (SDC), Student Case Management, or other appropriate office.

## GRADING POLICY

Below is the default grading scheme for this course. While the instructor reserves the right to change these cutoffs, you will not receive a grade lower than what is shown. If you get an average of 80% or more, you will get a B (not a B-) but, depending on the score, the instructor may set cutoffs so that with a high enough score above an 80 you might get a B+ or A-.

Grade	Range
A	90%+
B	80%+
C	70%+
D	60%+
F	< 60%

As a student enrolled in this course, one of your responsibilities is to submit course work by the due dates listed in Canvas and zyBooks. With that said, I take my role as your instructor very seriously, and, in fact, I care about how well you do in this course and that you have a satisfying, rewarding experience.

To that end, it is my commitment to you to respond individually to the work you submit in this class and to return your work in a timely manner. Many items in this course are automatically graded. Items that require manual grading will be graded within 1 week. (If, however, due to unforeseeable circumstances, the grading of your work takes longer than the times I have listed here, I will keep you informed of my progress and make every effort to return your work with feedback as soon as I can.)

ASSIGNMENT	GRADE PERCENTAGE
zyBooks Reading	5%
Programming Assignments	10%
Lab Assignments	10%
Worksheets / Discussions / Participation	5%
Retrieval Practice Activities (RPA)/Quizzes	10%
Module Exams	40%
Final Exam	20%
<b>Total:</b>	<b>100 %</b>

\*Keep a copy of all work created for the course, including work submitted through Canvas course learning management system.

**Reading Assignments** are interactive readings in the zyBooks platform. You get points for completing these interactive readings and doing their participation and challenge activities.

**Lab and Programming Assignments** are in the zyBooks platform and use zyLabs. You will complete the assignment in zyLabs and submit it there. You can also use your own IDE and paste the resulting code into zyLabs for submission.

**Worksheets** are done in class as part of a group activity. The results are not graded, merely marked as a participation activity.

**Quizzes** are done during the semester as a formative kind of assignment, meaning that you can do/redo them up to 15 times during the entire semester. The highest grade will be kept for purpose of grading.

- Quizzes are initially due prior to the associated Exam and will be given an initial zero if not completed. Quiz retakes are then allowed through the last day of regular classes (generally the Friday before finals week).

**Exams** are given throughout the course. There is a total of 6 unit exams and a comprehensive final exam. The module exams are cumulative in that concepts covered up through and including the exam's module may appear on the exam, however they often focus on material since the last exam (or since the start of the course for the first exam).

## SUMMER SESSION INFORMATION

If you are taking this course over the summer, please note that we go at double speed, completing an entire 4 credit course in just 8 weeks. This means that you will have twice as much work each calendar week, it will be an equivalent workload to taking 8 credits during a regular semester for just this one course. Please plan other courses over the summer accordingly so that you have enough time to complete each course.

## CANVAS INFORMATION & TECHNICAL SUPPORT

Canvas is where course content and grades will reside for this course.

- Login: [canvas.colostate.edu](https://canvas.colostate.edu)
- Support: [info.canvas.colostate.edu](https://info.canvas.colostate.edu)
- For passwords or any other computer-related technical support, contact the [Central IT Technical Support Help Desk](#).
  - (970) 491-7276
  - [help@colostate.edu](mailto:help@colostate.edu)

The [Technical Requirements](#) page identifies the browsers, operating systems, and plugins that work best with Canvas. If you are new to Canvas quickly review [the Canvas Student Orientation](#) materials.

## ACADEMIC INTEGRITY & CSU HONOR PLEDGE

This course will adhere to the CSU [Academic Integrity/Misconduct](#) policy as found in the General Catalog and the [Student Conduct Code](#).

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course.

Generative AI tools such as ChatGPT or Claude are increasingly powerful and might be capable of solving some of the assignments. **However, the assignments must be your own work and the use of these tools for generating assignment solutions is prohibited (will be treated as a violation of academic integrity).**

There are multiple reasons why these tools are detrimental to your learning experience:

- They rob you of the ability to think and learn the concepts for yourself since solving problems is an essential step to gaining a solid understanding of the material.
- You will struggle with the in-classroom quizzes and exams where you will not have access to these tools.
- While we acknowledge that these tools are likely to become an important part of a software engineer's workflow in the future, you are much more likely to use these tools in an effective manner if you already have expertise in the relevant technical topics. Developing such expertise requires putting in the effort to learn these topics without the assistance of these tools.
- These tools are prone to generating imperfect or even incorrect solutions, so trusting them blindly can lead to bad consequences.

Ultimately, you will get out of the class what you put in. Simply copying and pasting code from ChatGPT/Claude will not lead to any learning. If you are stuck on the assignments, reach out to the course staff. The course staff is here to help you!

Further information about Academic Integrity is available at CSU's [Academic Integrity - Student Resources](#).

## UNIVERSAL DESIGN FOR LEARNING/ACCOMMODATION OF NEEDS

I am committed to the principle of universal learning. This means that our classroom, our virtual spaces, our practices, and our interactions be as inclusive as possible. Mutual respect, civility, and the ability to listen and observe others carefully are crucial to universal learning.

If you are a student who will need accommodations in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner. A verifying memo from [The Student Disability Center](#) may be required before any accommodation is provided.

The Student Disability Center (SDC) has the authority to verify and confirm the eligibility of students with disabilities for the majority of accommodations. While some accommodations may be provided by other departments, a student is not automatically eligible for those accommodations unless their disability can be verified and the need for the accommodation confirmed, either through SDC or through acceptable means defined by the particular department. Faculty and staff may consult with the SDC staff whenever there is doubt as to the appropriateness of an accommodative request by a student with a disability.

The goal of SDC is to normalize disability as part of the culture of diversity at Colorado State University. The characteristic of having a disability simply provides the basis of the support that is available to students. The goal is to ensure students with disabilities have the opportunity to be as successful as they have the capability to be.

Support and services are offered to student with functional limitations due to visual, hearing, learning, or mobility disabilities as well as to students who have specific physical or mental health conditions due to epilepsy, diabetes, asthma, AIDS, psychiatric diagnoses, etc. Students who are temporarily disabled are also eligible for support and assistance.

Any student who is enrolled at CSU, and who self-identifies with SDC as having a disability, is eligible for support from SDC. Specific accommodations are determined individually for each student and must be supported by appropriate documentation and/or evaluation of needs consistent with a particular type of disability. SDC reserves the right to ask for any appropriate documentation of disability in order to determine a student's eligibility for accommodations as well as in support for specific accommodative requests. The accommodative process begins once a student meets with an accommodation's specialist in the SDC.

### THIRD-PARTY TOOLS/PRIVACY

Please note that this course may require you to use third-party tools (tools outside of the Canvas learning management system), such as Skype and others. Some of these tools may collect and share information about their users. Because your privacy is important, you are encouraged to consult the privacy policies for any third-party tools in this course so that you are aware of how your personal information is collected, used and shared.

### COPYRIGHTED COURSE MATERIALS

Please do not share material from this course in online, print, or other media. Course material is the property of the instructor who developed the course. Materials authored by third parties and used in the course are also subject to copyright protections. Posting course materials on external sites (commercial or not) violates both copyright law and the CSU Student Conduct Code. Students who share course content without the instructor's express permission, including with online sites that post materials to sell to other students, could face appropriate disciplinary or legal action.

### UNDOCUMENTED STUDENT SUPPORT

Any CSU student who faces challenges or hardships due to their legal status in the United States and believes that it may impact their academic performance in this course is encouraged to visit [Student Support Services for Undocumented, DACA & ASSET](#) for resources and support. Additionally, only if you feel comfortable, please notify your professor so they may pass along any additional resources they may possess.

### TITLE IX/INTERPERSONAL VIOLENCE

For the full statement regarding role and responsibilities about reporting harassment, sexual harassment, sexual misconduct, domestic violence, dating violence, stalking, and the retaliation policy please go to: [Title IX – Sexual Assault, Sexual Violence, Sexual Harassment](#).

If you feel that your rights have been compromised at CSU, several resources are available to assist:

- Student Resolution Center, 200 Lory Student Center, 491-7165
- Office of Equal Opportunity, 101 Student Services, 491-5836

A note about interpersonal violence: If you or someone you know has experienced sexual assault, relationship violence and/or stalking, know that you are not alone. As instructors, we are

required by law to notify university officials about disclosures related to interpersonal violence. Confidential victim advocates are available 24 hours a day, 365 days a year to provide support related to the emotional, physical, physiological and legal aftermath of interpersonal violence. Contact the Victim Assistance Team at: 970-492-4242.

## RELIGIOUS OBSERVANCES

CSU does not discriminate on the basis of religion. Reasonable accommodation should be made to allow individuals to observe their established religious holidays. Students seeking an exemption from attending class or completing assigned course work for a religious holiday will need to fill out the [Religious Accommodation Request Form](#) and turn it in to the Division of Student Affairs, located on the second level of the Administration building.

Once turned in, the Division of Student Affairs will review the request and contact the student accordingly. If approved, the student will receive a memo from the Dean of Students to give to their professor or course instructor.

Students are asked to turn in the request forms as soon as the conflict is noticed. Similarly, unanticipated conflicts requiring a religious observance, such as a death in the family, can also be reviewed.

## CSU PRINCIPLES OF COMMUNITY

**Inclusion:** We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

**Integrity:** We are accountable for our actions and will act ethically and honestly in all our interactions.

**Respect:** We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

**Service:** We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

**Social Justice:** We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.



## DIVERSITY AND INCLUSION

The [Mission, Vision, and Focus](#) webpage of the Vice President for Diversity includes a comprehensive statement of CSU's commitment to diversity and inclusion.