

## CS 235 SYLLABUS AND PORTFOLIO

This course is about learning to organize data, otherwise known as things, in such a way that it can be sensibly thought about and manipulated. Data is the foundation of all computing. That's why it is vital to know how to organize it. Non-naive implementations of data structures are used throughout computing, both in hardware and software. Also, this class helps prepare you for Discrete Math I and the Algorithms class.

### 1. OBJECTIVES

- Create and understand naive implementations of some common data structures such as lists, trees, graphs, etc.
- Understand how each data structure helps us organize data.
- Begin to understand when one data structure would be preferable for use vs another one.
- Begin to understand how long algorithms used to implement these naive implementations take to do their job relative to other algorithms.

### 2. PREREQUISITES

You must have successfully completed CS 165 Object Oriented Software Development.

### 3. REQUIREMENTS

You can purchase

#### 3.1. Text. C++ Data Structures.

*James Helfrich* from the book store or [download it](#) in electronic format.

#### 3.2. Documents.

- [Course Materials including this Syllabus](#)
- [Unit Tests for Each Data Structure](#)

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*Date:* January 7, 2020.

### 3.3. Software.

- All Platforms
  - A cloned version of the [unit tests](#) for the course.
  - A **PRIVATE** gitHub repository for your team code solutions. FYI, any public repository or other public sharing of your team or personal solutions on the internet or any file sharing service, during or after completion of the class, is cheating and will be treated as such.
  - <https://www.iclicker.com/instructors/software/iclicker-cloud/iClickerCloud> for your phone
- Windows
  - [MinGW](#),
  - [Visual Studio Code](#), and
  - [VSCode set up to do stepwise debugging](#)
  - FYI, to compile and pass the tests, you will need to compile using the *static* compiler flag. For example, `g++ *.cpp -static`.
- MacOS - Xcode (available for free in the App Store).

## 4. BEHAVIORAL REQUIREMENTS

You are required to...

- attend class, as assessments will happen in class each day that are not reproducible outside of class.
- read assigned portions of the course materials *before* the class each Monday.
- complete all the tasks each week to deepen your understanding of selected data collection.

## 5. COURSE PERIODICITY

This course has a weekly period, i.e. you can count on knowing ahead of time what you will be doing each day of each week. Each class period consists of three 20 minute sections. On Mondays these sections are:

(1) ***Presentation***

A time where I will add depth information to the preparation material you've read **before class**. This will only cover two of the concepts from the text that I think are the trickiest to understand.

(2) ***Class Directed Learning***

You will participate in a class-wide activity that reinforces what you've read and what I've shown you.

(3) ***Do Tasks***

During this time period, as a team of 2 or 3 you will create solutions to tasks for the week.

On Wednesdays the three sections are:

(1) ***Answer Questions***

I will answer questions that were submitted to the slack channel by you before Monday at midnight.

(2) ***Class Directed Learning***

You will participate in a class-wide activity that reinforces what you've read and what I've shown you.

(3) ***Do Tasks***

This is in-class time for individual work on the problem set for the week. Successful students will have started working on the problem set **before** this half-hour.

Fridays are dedicated to working on tasks for the week with help from me and the tutor.

**5.1. Questions.** The questions answered on Wednesdays are generalized from those you submit via the slack channel on Monday Evenings. You must submit any and all unanswered questions on Monday evening. Not submitting questions leads to a reduced learning experience. You will have plenty of questions. Submit them! Choose knowledge not ignorance.

The easiest way to come up with these questions is to write them down as you read the text for the week. While you are reading the text, each time you don't understand something write down a question about what you just read. The great thing about this approach is, since you completed the reading for the week before class on Monday, you have a set of questions to choose from to submit before midnight.

## 6. ASSESSMENT

Quatri-weekly, every four weeks, you will meet with me in my office. The purpose of this meeting is for you to present your portfolio of work to me, make a grade-to-date claim, and provide evidence regarding why that grade is correct. Your portfolio **MUST** follow the example portfolio's format and be complete and internally consistent.

The portfolio you bring to me for our meeting must be a hard-copy containing all non-code artifacts from completing your tasks.

**6.1. Late Work.** Late work is accepted *only if* the reason is extraordinary, and acceptance is reached through private and prolonged negotiation. Also, you must come talk to me in person in my office — NOT by email, nor any other means of communication.

**6.2. Grades.** In each of our three personal meetings, you will present your portfolio and a letter based grade-to-date claim. Afterwards I will give you my thoughts on the strength of your claim. The last claim that you make, taking into account any feedback from me, will be your final grade for the course. All of your claims

must be evidence based. That means you must bring the evidence with you, in your portfolio, that supports your claim.

**6.3. Letter-Based-Grades.** You are required to use the definition of the grades from the University Catalog:

**A** represents outstanding understanding, application, and integration of subject material and extensive evidence of original thinking, skillful use of concepts, and ability to analyze and solve complex problems. Demonstrates diligent application of Learning Model principles, including initiative in serving other students.

Note: Notice this description of A implies that you have gone above and beyond. To claim this grade, throughout the 4 week period you *must* have continually done things similar to what you see in the list below and recorded evidence of this behavior in your portfolio. Examples of the required types of behaviors are:

- teaching and/or helping others in the class but not in your group,
- helping a Non-CS, Non-CE, Non-EE, Non-SE major with their homework for a non-tech class using the principles you learned in this class,
- applying what you've learned in this class in another class you are currently taking, and
- doing work not assigned such as writing code using what you are learning that has not been assigned, etc.

**B** represents considerable/significant understanding, application, and incorporation of the material which would prepare a student to be successful in next level courses, graduate school or employment. The student participates in the Learning Model as applied in the course.

**C** represents sufficient understanding of subject matter. The student demonstrates minimal initiative to be prepared for class. Sequenced courses could be attempted, but mastering new materials might prove challenging. The student participates only marginally in the Learning Model.

**D** represents poor performance and initiative to learn and understand and apply course materials. Retaking a course or remediation may be necessary to prepare for additional instruction in this subject matter.

## 7. UNIVERSITY POLICIES

Here is a list of links to the policies enforced in this class. You are responsible to know and abide by these.

- [Academic Honesty](#)
- [Dress and Grooming Standards](#)
- [Student Grievance](#)
- [Sexual Harassment](#)
- [Disabilities](#)

## 8. OTHER

- The university provides [Academic Help and Support](#) for those who desire it.
- This document may be modified by the instructor at any time without notification.

## 9. READINGS

These readings are to be completed *prior to* each listed week's Monday class.

Week	From Text
1	Chapter 00 and Appendices E, F, and G
2	Chapter 1 - Vector
3	Chapter 2 - Stack
4	Chapter 3 - Queue
5	Chapter 4 - Deque
6	Chapter 5 - Set
7	Chapter 7 - List
8	None
9	Chapter 9 - Binary Search Tree
10	Chapter 10 - Map
11	Chapter 12 - Hash
12	Chapter 13 - Graph
13	Continuation of Graph

## 10. PORTFOLIO

10.1. **Course Tracker.** You are required to track your progress in the course using this table.

Note: Currently, you see full credit for week one's work. (✓ means yes. Blank means no.)

Course Tracker								
Week	Monday					Wednesday		Friday
	CRU	PFP	CDL	CAE	SAQ	PAQ	CDL	PT
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

This is an honest and true record of my work for this course.

Signature: \_\_\_\_\_

Your Name Here

10.1.1. *Tracker Acronym Key.* Course Tracker acronyms and their meanings.

- **CRU** - I Completed the Reading and achieved a level of Understanding **before** the start of Monday's class. While reading, I recorded questions about the items I didn't understand.
- **PFP** - I was present for and attentive to the presentation for this date.
- **CDL** - I fully participated in the Class Defined Learning for this date.
- **CAE** - I fully participated in the Create And Explain portion of the class for this date.
- **SAQ** - I submitted *at least 1* appropriate, Significant, Actual Question I have regarding the information for this week.
- **PAQ** - I was Present for and Attentive to the Answer Questions presentation for this date.
- **PT** - Individually, I completed and have a strong understanding of this Percentage of the **T**asks before Friday at Midnight. (You are responsible

for deciding how to weight assert tasks against the other tasks. They are all equally important to your understanding claim.)

10.2. **Grade Claims.** On the week indicated, bring this updated document to my office and make your claim.

Claim Week	Grade Claim	Instructor Grade	Adjusted Grade
5			
9			
13 - 14			

**10.3. Evidences.**10.3.1. *Week 1.*

- (1) Some Exercise or Problem Description.  
Solution
- (2) Some Other Exercise or Problem Description.  
Solution/Code

10.3.2. *Week 2.*

- (1) Some Exercise or Problem Description.  
Solution
- (2) Some Other Exercise or Problem Description.  
Solution/Code