

OAKLAND UNIVERSITY
Department of Computer Science & Engineering
CSI 2310/5006-002

DATA STRUCTURES

COURSE REFERENCE #: 14481, 15102

COURSE #: CSI 2310/5006 (original CSE 231)

YEAR: Winter 2018

PROFESSOR: Dr. Chaoyang Li

OFFICE PHONE NUMBER: 248 370 4077

OFFICE Location: Room 128, DH

DAY/TIME: 3:30 pm-5:17 pm MW

CLASS LOCATION: Elliott Hall 214

EMAIL: chaoyangli@oakland.edu

OFFICE HOURS: 12:30pm-1:30 pm, MW
or by appointment

CREDITS: 4.000

TA's name: Yun Qi

TA's email: yunqi@oakland.edu

TA's office hour: 3:00pm-5:00pm TR

TA's office location: EC501

Disclaimer: "This course syllabus provides a general plan for the course; deviations may be necessary."

COURSE DESCRIPTION

This course covers data structures using object oriented programming. The fundamental data structures in computer science, including stacks, queues, lists and trees are covered in detail. Concepts of design, analysis and verification are discussed in the context of abstract data types. Examples of applications taken from numeric and symbolic domains are used. With laboratory.

PREREQUISITES

CSE 230 or CIT 230 or CSI 2300.

COURSE OBJECTIVES

On successful completion of this course, student should be able to:

- Design Java programs using Abstract Data Types (ADT)
- Implement ADT using array-based and pointer-based representation.
- Implement/use linked lists, binary trees, stacks, queues, priority queues.
- Describe/use traversal, search and sorting procedures.
- Use recursion in ADT implementations.
- Describe concepts of and basic operations on hash tables and B-trees.

COURSE CONTENT

Students are expected to apply their knowledge obtained from CSI 2300. This class will concentrate on Data Structures rather than Java syntax and semantics. However, students will be using Java to implement the various Data Structures that will be covered in class. We will cover chapters 1 through 15 of the text beginning from chapter 1 and continuing in ascending sequence (unless otherwise told). The Vector Data Structure will also be covered. It is expected that students will read the chapters ahead of lectures so that they are prepared.

REQUIRED TEXT

(Must Have) Frank M. Carrano & Janet J. Prichard: Data Abstraction & Problem Solving with Java: Walls & Mirrors. 3rd edition. Pearson - Addison Wesley Longman, Inc. 2010

SOFTWARE PACKAGE: SDK/JDK 7 or newer version OR NetBeans 7.5 or newer. Download from the Internet at SunJava website - <http://www.oracle.com/technetwork/java/javase/downloads/jdk-7-netbeans-download-432126.html>

COURSE FORMAT: lecture

IMPORTANT OU DEADLINES:

Last day official withdrawal - 2nd half classes. In-person drops of courses must be received by the Office of the Registrar by 4 p.m.

ASSIGNMENTS: Assignments must be handed in on time and will not be accepted when past due time (i.e., class time on the due day). Email submissions are not allowed. Solutions of assignments and tests are discussed in class, so students are responsible to get graded assignments (students may keep them), know solutions, and review tests.

This class is considered to be one of the CTW (Critical Thinking Through Writing) class, which means therefore, that the instructor would evaluate student performance based upon the following with regards to both assignments and exams:

1. Analysis.
2. Description
3. Understanding.
4. Preparation.
5. Completeness.
6. Correctness.
7. English Grammar, etc.

Therefore, in order to adhere to the CTW needs, the distribution of points for the documentation and the execution of the program according to all of the requirements for each assignment are:

Documentation:

- | | |
|---|------|
| 1. Explain the purpose of the program and detail as possible | 13%. |
| 2. Develop a solution for the problem and mention algorithm used | 16% |
| 3. List data structures to be used in the solution | 5% |
| 4. Give a description of how to use the program and expected input/output | 5% |
| 5. Explain the purpose of each class you develop in the program | 5% |

Programming:

- | | |
|---|-----|
| 1. For each method, give the pre and post conditions and invariants, if any | 10% |
| 2. Program execution according to the requirements | 36% |
| 3. Naming of program as required | 5% |

4. Submit source code

5%

GRADING:

Percentage	Grade
97.5-100%	4
94.5-97.4%	3.9
92-94.4%	3.8
90-92.4%	3.7
87-89.4%	3.6
85-87.4%	3.5
82-84.4%	3.4
80-82.4%	3.3
77-79.4%	3.2
75-77.4%	3.1
72-74.4%	3
70-72.4%	2.9
67-69.4%	2.8
65-67.4%	2.7
62-64.4%	2.6
60-62.4%	2.5
50-59.4%	2.0-2.4
Anything below 500	Failing grade

GRADING Assessment:

There will be two class tests and the final exam, and a number of programming assignments, equally weighted. There will also be about 2 small programs given to be coded and turned in during lab session – equally weighted.

- 1) Test 1 20%
- 2) Test 2 20%
- 3) Finals 12%
- 4) Assignments 39%
- 5) Lab programs 9%

NOTE: I **MAY NOT** give a Final exam and if that is the case, then each class test will be worth 26% (points) rather than 20% (points). This will be discussed further in class.

Adjustments may be made to assignments in class. If a student is absent, it is his/her responsibility to get such changes. No excuses will be accepted if an assignment is changed or adjusted in class.

Grading Explained: Note: This calculation is JUST an example. There MAY be more than 6 assignments!!!!

In-class		Homework		Lab Programs	
Tests	Weights	Assignments	Weights	Lab programs	Weights
Test #1	20%	Program #1	6.5%	Lab 1	4.5%
		Program #2	6.5%	Lab 2	4.5%
Test #2	20%	Program #3	6.5%		
		Program #4	6.5%		
Finals	12%	Program #5	6.5%		
		Program #6	6.5%		
Total Weight=52%		Total Weight=39%		Total Weight=9%	

Examples.

Student X

Test scores: 75, 75, 80.

Assignments scores: 88, 90, 95, 80, 85, 95 and labs are 90, 95.

Step 1.

$$WATA = (.2*75 + .2*75 + .12 * 80 + .065*88 + .065*90 + .065*95 + .065*80 + .065*85 + .065*95 + .045*90 + .045*95) = 82.57 \approx 83$$

Step 2. 83 is in the range 82-84.4%, Student X receives 3.4.

PLEASE NOTE:

1. In class attendance will be taken and can directly affect your final grade- more than 10% absence can result in your withdrawal from the class with a resulting grade of "PW". Any handouts and assignments missed will be the sole responsibility of the students.
2. **PLAGIARISM.** All work submitted for grading must be the student's own work. Plagiarism will result in a **score of 0** for the work or dismissal from the course and the Dean of Students Office will be notified. No copying from another student's work is allowed. It is the students' duty to allow no one to copy his/her work. If it is found, in the opinion of the instructor, that one student copy from another, both papers will be given 0 regardless of who copied from whom.
3. All assignments must be turned in at Moodle in the respect assignment folder before the indicated due date.
 - Any assignment turned in without the .class/.jar or the .java file will immediately lose 50%.
 - **Late assignments will NOT be accepted**
 - Generally, all assignments and tests will be graded and returned with **ONE** week. If for some reason, I am unable to do so, students will be notified.
 - Please do not come at the end of the semester asking to turn in assignments that you did not turn in at the due date for that assignment so that you can get a chance to improve your final grade!!!! **IT WILL NOT BE ACCEPTED!!!!!!!**
4. **No make up test will be given.** If you will be absent for a test due to sickness, your case may be considered (i.e. you may or may not be given a makeup exam) based upon a letter from a medical doctor or a legal office written on that doctor's letter head or the legal office's letterhead, stating that you were unable to attend school (and hence take the exam) on the given day. *Absolutely no makeup or excuse for the final exam.* If for some medical or legal reason you cannot take the final exam, then you should consider applying for an **Incomplete**.
5. If you are taking more than one class during this semester, make sure that your final exams are not "clustered". That is, you do not have exams close to each other. Notify me earlier if this is your case. Do not wait for the last moment – i.e. 2 or 3 days before the final exam.
6. I will give neither extra assignment nor exam at any time during the semester to boost your grade.
7. Very important- **Please Turn Off All Electronic Devices during class time.** This includes (but is not limited to) all laptop computer, hand held devices, cell phones, etc. The only exception is if the instructor ask you turn on such devices. If you do not comply with this simple request, the instructor will ask that you leave the classroom.
8. I MAY schedule seating arrangements for exams!!!
9. **Grading:** Assignments and exams will be graded and returned in approximately one week after it was collected or given respectively. Should there be a delay, the students will be notified. Also, if you have a question about a graded paper, please query it with me or the TA within **one** week (during office hours or LAB time) after which it was returned. Failure to do so within this one week period will indicated that you are satisfied with the grade for that assignment, quiz, and/or exam and it will no longer be reviewed by the Instructor or the TA. Also there would be **NO CURVING OF ANY TESTS OR ASSIGNMENTS.**