CIS 22C Data Abstraction and Structures - Fall 2022

Instructor: Mirsaeid Abolghasemi

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Class hours: TBA - No live session - The recorded videos will be posted on Canvas

Office hours: Monday 5 PM - 6 PM - Zoom online meeting - The link will be posted on Canvas

Description:
Application of software engineering techniques to the design and development of large programs; data abstraction and structures and associated algorithms: stacks, queues, linked lists, trees, graphs, and hash tables; internal and external sorting; use of recursion; team project.

Student Learning Outcome Statements (SLO):
- Student Learning Outcome: Read, analyze and explain advanced data structures programs.
- Student Learning Outcome: Design solutions for advanced problems using appropriate design methodology incorporating advanced data structures programming constructs.
- Student Learning Outcome: Create and analyze efficiency of advanced level data structures algorithms, code, document, debug, and test advanced data structures programs using multiple source and header files.

Course Objectives:
- Create programs which implement the stack data structure.
- Create programs which implement the queue data structure.
- Create programs which implement complex linear lists.
- Create recursive algorithms and relate efficiency to uses of recursion.
- Create programs which implement the binary tree, binary search tree, AVL tree, priority queues, and binary heaps data structures.
- Create programs which implement hashed tables.
- Demonstrate knowledge of advanced sorting algorithms and discuss the usage and relative advantages of various sorts and their efficiency.
- Demonstrate knowledge of external sorting algorithms.
- Create programs which implement the graph data structure.
- Apply software engineering principles including structured programming, object-oriented programming, and abstract data types.
- Design and implement a team project with multiple classes in multiple files.
- Demonstrate usage of templates/generics.

Course Information:
Term: 2022 Fall De Anza | **CRN:** 26034 | **Title:** DATA ABSTRACT & STRUCTURES | **Course:** CIS D022C03Z | **Days:** TBA | **Time:** TBA - TBA | **Room:** ONLINE | **Prerequisite:** CIS 22B, 22BH or 35A. **Advisory:** MATH 212 or equivalent.

Textbook:
- Frank M. Carrano, "Data Structures and Abstractions with Java", 5th edition, Walls and Mirrors, 2018. (4th edition is also fine)

Grading	
Quizzes	%35
Lab and Exercises	%20
Midterm Parts 1 and 2	%20
Final Parts 1 and 2	%25
Total	**%100**

Extra credit opportunities: Several labs will have bonus points added when a solution is creative, documentation is extra informative, a lab exercise is submitted early, and/or code is exceptionally easy to read.

Lectures, attendance, labs, exercises, midterm, and final:

- This class is based on the **Java** language and it will be hard for students who do not know Java. I recommend this class for students who know Java or want to learn Java.
- Assignments should be submitted before the due date. If submitted late, then the homework score will be reduced with a penalty of 10% per day.
- Assignments should be commented on with your name and team name.
- Students can use any IDEs to do their assignments.
- **Lectures:**
    - o The recorded video links will be posted on Canvas.
    - o All the recorded lectures are based on the **Java** language.
- **Attendance**:
    - o No attendance is needed but students should take the attendance quizzes.
    - o No live session.
    - o But students should be active on Canvas, especially in the first two weeks. I can check the students' activities on Canvas.
    - o If a student was not active on the first day of class, they will be dropped from the class. So, taking the mandatory quiz and being active on Canvas are important.
- **Labs and exercises:** All labs and exercises are based on the Java language. Students can do them in any language such as Java, C++, or Python but the assignments' format is based on Java. So, students have to change the whole code from Java to the language that they want to code. It may not be easy and **I recommend doing them in Java.**
- **Quizzes:**
    - o Quizzes are language-independent (No coding)
    - o Quizzes are multiple-choice and true/false questions.
    - o Students need to have a camera on their computers.
    - o Students should have Zoom installed on their computers to take the exams.
    - o Students should record the exam based on the instruction posted on Canvas and upload the recorded video on their Google Drive (or any other clouds). Then share a link to the recorded video without a password. After grading, students can delete the recorded video from their Google Drive.
- **Midterm part 1:** The coding part
    - o Students can do it in any language Java, C++, or Python, at home.
    - o Students should do it in a team but each student should write their names and team's names on their codes.
    - o Students can do it individually but teamwork is recommended. If you want to do it individually, it means you are good enough in data structures, and you do not need help.
    - o No presentation is needed for Midterm part 1.

- **Midterm part 2:**
  - o Midterm part 2 is similar to the quizzes and language-independent(No coding).
  - o Students need to have a camera on their computers.
  - o Students should have Zoom installed on their computers to take the exams.
  - o Students should record the exam based on the instruction posted in Canvas and upload the recorded video on their Google Drive. Then share a link to the recorded video without a password. After grading, students can delete the recorded video from their Google Drive.
- **Final part 1:** Final part 1 is the final project (the coding part)
  - o Students can do it in any language Java, C++, or Python, at home.
  - o Students should do it in a team but each student should write their names and team's names on their codes.
  - o Students can do it individually but teamwork is recommended. If you want to do it individually, it means you are good enough in data structures, and you do not need help.
  - o No presentation is needed for Final part 1.
- **Final part 2:**
  - o Final part 2 is similar to the quizzes and language-independent (No coding).
  - o Students need to have a camera on their computers.
  - o Students should have Zoom installed on their computers to take the exams.
  - o Students should record the exam based on the instruction posted in Canvas and upload the recorded video on their Google Drive. Then share a link to the recorded video without a password. After grading, students can delete the recorded video from their Google Drive.
- Midterm and final parts 1 and 2 are together and students should do both parts 1 and 2 to get their midterm or final grades.

Grade average required:

A+	98% and up
A	94%-97%
A-	90%-93%
B+	87%-89%
B	84%-86%
B-	80%-83%
C+	77%-79%
C	70%-76%
F	69% or less

De Anza Academy Integrity:

https://www.deanza.edu/policies/academic_integrity.html

Homework and labs must be your work to the following extent:
- Do not send your code to anyone.
- Do not copy anyone else's code.
- DO NOT LOOK AT OTHER STUDENTS WORK AND SHOW THEM YOURS.
- As long as you are not copying other's work, discussion and exchange of ideas are encouraged.

Disability Accommodations:

De Anza College views disability as an important aspect of diversity, and is committed to providing equitable access to learning opportunities for all students.

Disability Support Services (DSS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations If you have, or think you have, a disability in any area such as, mental health, attention, learning, chronic health, sensory, or physical, please contact DSS to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DSS and have accommodations set by a DSS counselor, please be sure that your instructor has received your accommodation letter from Clockwork early in the quarter to review how the accommodations will

be applied in the course. Students who need accommodated test proctoring must meet appointment booking deadlines at the Testing Center. a) Midterm exam be booked at least five (5) business days in advance of the instructor approved exam date/time. b) Final exams must be scheduled seven (7) business days/weekdays in advance of the instructor approved exam date/time. Failure to meet appointment booking deadlines will result in the forfeit of testing accommodations and you will be required to take your exam with the class.

DSS Location: RSS Building, Suite 141 Phone: (408) 430-7681 Email: DSS@deanza.edu

Students with special needs to: https://www.deanza.edu/dsps/index.html

=> Important Dates:

(Please check the Academic Calendar on the De Anza College website. These dates may get changed.)

http://deanza.edu/calendar

Last Day for Drops w/ Refund	October 9, 2022
Last Day for Drops w/o W	October 9, 2022
Last Day for Drops	November 18, 2022

(Students are responsible to check the Academic Calendar for important deadlines and any changes in the deadlines.)

The schedule of the class sessions:
- No live session.
- No presentation is needed.
- No attendance is required => **But students should take the attendance quizzes every week to show they are active in class.**

Week 1: September 26 - October 2
  (The first session - reviewing the syllabus)
  (Java Preparation)
Week 2: October 3 - October 9
  (Lists(Ch12))
  (1-ArrayList and LinkedList implementations(Ch13, Ch14) & 2-Algorithm Efficiency (Ch04))
Week 3: October 10 - October 16
  (Quiz 1: April 22. Students can take it at any time between 9 am and 11:59 pm.)
week 4: October 17 - October 23
  (Bags & reviewing quiz 1)
  (Stacks)
week 5: October 24 - October 30
  (5- Recursion & 6- Queues)
  (Hashing (Dictionaries and Hashing) (about Quiz 2 and Midterm part 1 and 2))
week 6: October 31 - November 6
  (Quiz 2: May 13. Students can take it at any time between 9 am and 11:59 pm.)
  (Reviewing Quiz 2 and discussing more on Midterm part 1 and part 2)
week 7: November 7 - November 13
(Midterm Part 1: The due date for midterm part 1 (coding part) will be on November 13 at 11:59 pm. Midterm part 1 will be opened two weeks before its due date.)
(Midterm Part 2: May 11. Students can take it at any time between 9 am and 11:59 pm.)
week 8: November 14 - November 20
  (Trees, BST)
week 9: November 21 - November 27

(Quiz 3: June 3. Students can take it at any time between 9 am and 11:59 pm.)
(Graphs -Final Part 1 will be published)
week 10: November 28 - December 4
(Heaps)
(AVL)
week 11: December 5 - December 11
(Sorting & Searching (Not for final) and Final review)
week 12: December 12 - December 16
(Final week)

Final Exam:

- The due date for final part 1 (coding part) will be on December 15 at 11:59 pm. Final part 1 will be opened two weeks before its due date.
- Final part 2 (multiple-choice questions) will be opened on Friday, December 24. Students can take it at any time between 9 am and **9 pm**.

=> Very Important Notice:

- **This item is very important:**
  - **Once students have completed the introductory survey, they are responsible for dropping classes.**
  - **Therefore, if students want to drop the class THEY NEED TO DO IT.**
  - **Please DO NOT wait for the college system or your instructor to drop you.**
  - **So, I do not accept any requests from students to drop the class or any other official communications.**
- **Again, students are responsible to check the Academic Calendar for important deadlines and any changes in the deadlines.**
- **To take the quizzes, midterm part 2 and final part 2:**
  - **Students should have Zoom installed on their computers to take the exams.**
  - **Students need to have a camera on their computers.**
- **Students should update their Canvas profile pictures with a picture showing their faces.**
- **Your first name and last name on Canvas should be your official first name and last name.**
- **For any questions, students should message me on Canvas (not email).**

De Anza Calendar:	http://deanza.edu/calendar
De Anza CIS Lab:	http://www.deanza.edu/buscs/labs.html
De Anza Canvas Web:	https://deanza.instructure.com/
Resources On Campus:	
Tutorial:	https://www.deanza.edu/studentsuccess/
EOPS:	https://www.deanza.edu/eops/
Counseling:	https://www.deanza.edu/counseling/
Mutual Respect Policy:	https://fhdafiles.fhda.edu/downloads/aboutfhda/4110.pdf
Student Grievance Procedure:	https://www.deanza.edu/policies/grievances.html
Student Rights & Responsibilities:	https://www.deanza.edu/student-complaints/rights-responsibilities.html
CARES Emergency Care Funds:	https://www.deanza.edu/resources/emergency-funds.html
Students with special needs to:	https://www.deanza.edu/dsps/index.html