

**Instructor:** Delia Gârbacea

**Office Location** : F51c  
**Phone** : (408) 864-8308  
**Email** : [GarbaceaDelia@DeAnza.edu](mailto:GarbaceaDelia@DeAnza.edu)

**Office Hours:** MTWTh 3:30 – 4:20p.m, F51c

**Class meetings:** Mon, Wed 1:30 – 3:20p.m., Lecture AT311  
The instructor will be available **Online:** Wed, 10:45 – 12:00p.m.

**Prerequisites:** Computer Information Systems 22B or equivalent. Advisory: Mathematics 212 or equivalent.

**Course 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.

**Text required:** Frank M. Carrano, "Data Abstraction & Problem Solving with C++", sixth edition, Walls and Mirrors, 2013 OR "Data Structures: A Pseudocode Approach With C" by Richard F. Gilberg. & Behrouz A. Forouzan second edition.

**Attendance policy:** This 4.5 Units course consists of 4 lecture hours (4x50min = 200min) and 1.5 lab hours (75min) per week. You are expected to attend all lecture and lab sessions. If you must be absent from class, arrange with another student to share class notes for that session. You should plan on spending approximately 12 to 15 hours per week to study and do your homework. If you wish to drop the class, it is your responsibility to do so. An unauthorized withdrawal from class without following official procedures will result in you being assigned a grade of "F" (or "NC" if you have selected the Credit /No Credit option).

**Academic support:** Remember, there is no such thing as a dumb question: you want to understand before you get lost. In addition, please be assured that I'm ready to assist you in any way possible as you meet the challenges ahead. The Tutorial Center provides free academic support and free workshops open to all De Anza students, and Adjunct Skills and Self-Paced Skills courses: <http://deanza.edu/studentsuccess/>

**Student Learning Outcomes:** By the end of the course, students will:

- Read, analyze and explain advanced data structures programs.
- Design solutions for advanced problems using appropriate design methodology incorporating advanced data structures programming constructs.
- 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:** Upon completion of the course, the student will:

- 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 and abstract data types.
- Design and implement a team project with multiple source and header files.

**Scholarly conduct:** In order to be successful in this class you will have to make a commitment to studying, reading the text, doing your homework, writing your lab assignments, attending class, and taking notes. Worthwhile contribution and regular attendance can positively affect the grades. You are expected to do your own work. Cheating or plagiarism in any form will not be tolerated. Copying or cheating during a test will result in a zero being assigned for that test and may result in a failing grade for the entire course. Any copied assignments will result in a zero grade for all parties, and may result in a failing grade for the entire course. It may also result in dismissal from class, college disciplinary action, and/or notation in their permanent records. The Business Division Dean will also be notified by letter. Please check the current Schedule of Classes to learn more about academic integrity, other policies, and Student Standards of Conduct (<http://www.deanza.edu/schedule/>).

**Reading assignments and recommended Review Questions, Exercises, and Problems** (see **15C\_StudyGuide.doc**): The exercises and problems are not to be run on the computer (unless you wish to). The purpose of these exercises and problems is to help clarify the material for you as we proceed and to prepare you for tests, therefore, although you do not have to turn them in, you are strongly encouraged to solve them.

**Tests:** There will be one midterm exam (100 points) and a comprehensive final (120min, 100 points). Both tests are open book, open notes. Test dates are shown on the calendar. Final exams papers will be retained for a period of 90 days from the exam date. The final exam will be similar to the midterm exam, emphasizing the material learned after the midterm but covering the rest of the quarter as well.

**Class and online assignments:** There will be given between 12 to 24 assignments to be completed in class or on line, such as group work, quizzes, etc. They are open book, open notes. There is no make up for any such assignment. These are pass/no pass type of assignments.

**Programming assignments (homework):** You will be given 5 programming assignments (100 points each) and a team project (100 points). They are to be run using the computer.

- Up to 5 points will be deducted for each day an assignment is late.
- No assignment will be accepted more than one week after the due date, unless there's an exceptional situation (email me or come and talk to me, preferable in advance).
- Partial credit will be given for incomplete assignments.
- There is no make up for any assignment.
- All assignments must be uploaded on Catalyst: all source and header files and any output generated by the program.
- If the first three programming assignments are satisfactory you will be given a **team project** (2-5 students in a team).

**Extra-credit assignments** may occasionally be given throughout the course (up to 9 points).

**Grading:** To pass the class you have to do the following:

1. complete **80%** of the class assignments
2. labavg = average of the 5 programming assignments and the team project considered twice should be **70** or greater
3. mt = the midterm exam should be **60** or greater
4. final exam score should be **60** or greater

If all of the above are true, your final grade will be calculated as follows:

$$\text{score} = (\text{labavg} + \text{mt} + \text{final} + \text{extra credit}) / 3$$

Your grade is based on the score you earn as shown below. Worthwhile contribution and regular attendance can positively affect the grades.

Class Assignments	: 12 - 24	P/NP
Programming Assignments	: 5 at 100 pts. Each	
Team Project (twice)	: 1 at 100 pts.	
	AVERAGE: 700 / 7 =	100
Midterm Exam	: 1 at 100 pts.	100
Final Exam	: 1 at 100 pts.	100
Extra Credit	:	9

$$\text{SCORE: } (100 + 100 + 100 + 9) / 3 = 103$$

[ 97, 103 ]	→ A+
[ 93, 97 )	→ A
[ 90, 93 )	→ A-
[ 87, 90 )	→ B+
[ 83, 87 )	→ B
[ 80, 83 )	→ B-
[ 77, 80 )	→ C+
[ 70, 77 )	→ C
[ 67, 70 )	→ D+
[ 63, 67 )	→ D
[ 60, 63 )	→ D-
[ 0, 60 )	→ F

## Tentative Schedule

	Chapters	Mon	Tuesday	Wed	Thursday	Fri	<u>Important Dates</u> <i>All dates are enforced!</i>
<b>SEPT</b> Week 1	Review Lnk Lists Pseudocode Algorithm Efficiency	23	24	25	26	27	<b>Saturday, Sept. 27</b> Last day to <a href="#">drop</a> for a <a href="#">refund</a> for out-of-state or foreign students
Week 2 <b>OCT</b>	Stacks Queues	29	30	1	2 <b>Hw 1</b>	3	<b>Saturday, Oct. 4</b> Last day to <a href="#">add</a> quarter-length classes <b>Sunday, Oct. 5</b> Last day to <a href="#">drop</a> a class with no record of grade
Week 3	Queues Linked Lists	6	7	8	9 <b>Hw 2</b>	10	
Week 4	Recursion Trees	13	14	15	16	17	<b>Friday, Oct. 17</b> Last day to <a href="#">request pass/no pass</a> grade
Week 5	Trees BST	20	21 Read and understand team project requirements. Create teams	22	23 <b>Hw 3</b>	24	
Week 6 <b>NOV</b>	Hashing	27	28 Team Project: Report 1 – due	29	30 <b>MT Exam</b>	31 	
Week 7	Hashing AVL Trees	3	4 Team Project: Report 2 – due.	5	6 <b>Hw 4</b>	7	
Week 8	AVL Trees Heaps	10	11	12	13	14	<b>Friday, Nov. 14</b> Last day to <a href="#">drop</a> with a "W"
Week 9	Graphs	17	18 Team Project: Report 3 – due.	19	20 <b>Hw 5</b>	21	
Week 10	Graphs Sorting - ShellSort - QuickSort - External Sorting	24	25 Team Project: Report 4 – due.	26	27 	28 	29 
Week 11 <b>DEC</b>	Project Presentations	1	2 <b>Project</b>	3	4 <b>Project</b>	5	
Week 12	Review Final Exam	8	9	10 <b>Final Exam</b>	11	12	<b>Final EXAM: Wed, Dec.10 6:15–8:15p.m.</b>