C.S.300
Data Structures
Fall 2011

Catalog Description

Data structures are fundamental to advanced, efficient programming. Topics including asymptotic analysis, stacks, queues, linked lists, trees, hash tables, searching and sorting will be covered in discussions centering around more sophisticated programming concepts and problem solving techniques. Prerequisite: CS 250 with a minimum grade of C. 4 credits.

Topics

- Asymptotic analysis of upper and average complexity bounds
- Identifying differences among best, average, and worst case behaviors
- Big O / Standard complexity classes / Time and space tradeoffs in algorithms
- Arrays
- Data representation in memory
- Static, stack, and heap allocation
- Runtime storage management
- Pointers and references
- Linked structures
- Implementation strategies for stacks, queues, and hash tables
- Implementation strategies for trees
- Strategies for choosing the right data structure
- The concept of recursion / Implementation of recursion
- Simple numerical algorithms
- Sequential and binary search algorithms
- Quadratic sorting algorithms (selection, insertion)
- Hash tables, including collision-avoidance strategies
- Binary search trees
- Debugging Strategies
- Design for reuse
- Activation records and storage management
- Use of open-source materials
- Tools for source control and their use in particular in team-work
- PF/FundamentalConstructs
- PF/DataStructures
- PF/SecureProgramming
- OS/Scripting
- SE/UsingAPIs
- SE/ToolsAndEnvironments
- PF/Recursion
- AL/BasicAnalysis

Many of the above topics were copied with permission from the Computing Curricula 2008 recommendations found at:http://www.acm.org/education/curricula/ComputerScience2008.pdf.

Tools

- Eclipse IDE
- gcc / gdb
- Subversion / Subclipse
- Valgrind
- GNU Make

Language(s)
- C

Operating System(s)
- Linux

Instructor Details

Professor:	Chadd Williams
Email:	chadd@pacificu.edu
Office:	Strain 202
Phone:	(503) 352-3041
Office Hours:	MW 2:30-3:30 Th 1-3 pm

Course Details

Course Title:	CS300 Data Structures
Prerequisite:	CS 250 Introduction to Computer Science II with a minimum grade of C.
Required For:	A minimum grade of C in CS300 is required for CS380, CS430, CS445, CS460 Operating Systems
Meeting Times:	MWF 9:15am - 10:20am
Location:	LL15
Textbooks:	Primary: None (Class notes and the Web will be the main references)
	Recommended: The C Programming Language 2nd Edition by Brian W. Kernighan Prentice Hall 0-13-110362-8

Course Website

http://zeus.cs.pacificu.edu/chadd/cs300f11

Course Assessment

Grade Distribution :

6-7 Programming Assignments	40%
unscheduled (open note) quizzes	5%
3 Exams	35%
Final	20%

Grading Breakdown:

		92-100%	A	90-92%	A-
88-90%	B+	82-88%	B	80-82%	B-
78-80%	C+	72-78%	C	70-72%	C-
68-70%	D+	60-68%	D		
		0-60%	F		

Program Grading:

Successful execution	70%
Acceptable structure, style, documentation, and efficiency. You must follow the C Coding Standards, version 6.0	30%

Important Dates

Tentative dates for Exams:
Exam 1:   Wednesday, September 21, 2011
Exam 2:   Wednesday, October 12, 2011
Exam 3:   Monday, November 14, 2011

Labor Day Holiday:
Monday, September 5, 2011 (No Classes)

Midsemester Break:
Friday, October 7, 2011 (No Classes for Arts & Sciences)

Thanksgiving Break:
Wednesday, November 23, 2011 through Sunday, November 27, 2011

Campus Calendar:
http://pacificu.edu/calendar/

Date of Final:
Tuesday, December 13, 2011, 3:00 pm - 5:30 pm

Policies

1. Attendance at every class is critical to your success in this course. I expect you to be on time and ready to go once it's 9:15am and that you stay until the end of class. Any missed lecture is your responsibility to make up; just remember, if you fall behind, it will be very difficult to catch up.

2. Programs are to be submitted by 9:15am on the day in which the assignment is due. Further, all assignments are to be done using Eclipse 3.7, gcc 4.5 or later, GNU Make 3.81 or later, and will be tested on Zeus (a 64-bit Linux server). You are allowed to turn in your assignments 24 hours late with a penalty of ten percentage points. You may turn in your program only once.

3. Make sure to test your program extensively on zeus before you turn it in. The lab machines in Strain 222 are similar, but not identical, to Zeus.

4. A program that does not successfully compile or produces no output loses 70% of the assignment grade.

5. No early or late exams/finals will be given.

6. No incompletes will be given.

7. Academic Dishonesty: Pacific University has no tolerance for academic dishonesty. It is university policy that all acts of academic dishonesty be reported to the Associate Dean. Forms of academic dishonesty include, but are not limited to, plagiarism, fabrication, cheating, tampering with grades, forging signatures, and using electronic information resources in violation of acceptable use policies. Please consult the Academic Conduct Policies in the A&S Catalog for more details.
   7.1. For programming assignments, plagiarism takes the form of, but is not limited to copying code from someone else, whether copying files, glancing at someone else's code, typing from someone else's notes or typing while they dictate. The source can be a classmate, former student, website, program listing found in the trash, or anything else. Furthermore, plagiarism even on a small part of the program is cheating.
   7.2. You should also note that aiding someone else's cheating also constitutes cheating. You should never leave your code where someone else could have access to it, such as staying logged onto a machine or placing solutions in the recycling bin where another student may take it.
   7.3. Sanctions that may be imposed for academic dishonesty are:
      a) First offense for cheating: 12 percentage points subtracted from your final course grade and a zero for the assignment or exam
      b) Second offense for cheating: `F' in the course.
   7.4. All code in any form generated from this course becomes the intellectual property of Pacific University. You may not share this code with anyone without obtaining written permission from Pacific University.

8. Neither computer failure, software failure, nor lack of computer access are accepted as excuses for late programs; therefore, start work on the programs as soon as they are assigned, and don't put them off until the last minute. Further, corruption of programs due to bad disk media is also not accepted as an excuse for late programs; therefore, always keep a current backup of all programs on a separate disk. Please note that the /home on zeus and ada are backed up and kept for *at most* 14 days. The lab machines are not backed up.

9. I reserve the right to raise or lower your grade based on class participation and attendance. Specifically, I may lower your grade or may officially withdraw you from the course through the tenth week of the semester for poor attendance or participation. Further, your final grade may be lowered by 1/3 of a grade (B to B-, for example) for each day of class that you do not attend for the entire 65 minutes. Please notify me PRIOR to class if you must miss class for any reason. Just sending an email prior to missing class does not guarantee you will be cleared to miss. Only legitimate reasons will be accepted as excuses for missing class.

10. You may be asked to leave the classroom if you are causing a distraction e.g. cell phone ringing, talking, etc

11. If you have a complaint regarding a grade on an assignment or exam, write a one paragraph description of why you feel the grade is incorrect and deliver it to the instructor. The paragraph must be delivered to the instructor within one calendar week of when the graded material is returned to the student. I will not consider any grade changes later than one week after the graded material is returned.

12. If you have a documented disability covered under the ADA then services and accommodations are available from LSS (Learning Support Services). If you need reasonable accommodations to fully participate in course activities or meet course requirements, you must contact Edna K. Gehring, Director of LSS , at X2107. She will meet with you, review the documentation of their disabilities, and discuss the services Pacific offers.