

# CS 2308: Foundations of Computer Science II

## Spring 2016

Section 257

**Instructor:** Dr. Jill Seaman  
Comal 307G  
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**Course Webpage:** <http://www.cs.txstate.edu/~js236/cs2308>

**Office Hours:** M, W: 2:00pm – 3:00pm  
T, R: 1:30pm – 3:00pm  
and by appt.

**Meeting Time/Place:** MW 3:30-04:50PM HPB 233

**Open Labs:** DERR 231: Linux Lab  
MCS 590: Windows Lab  
MCS 594: Lab tutors

**Text:** Tony Gaddis, Starting out with C++: From Control Structures through Objects, 8th Edition, ISBN: 0133769399

**List of recommended/required readings:**

Chapters 1-7 (review of CS 1428) (recommended)  
Chapters 8,9,10,11,13,17,18 (required)

**Prerequisites:** C or higher in CS 1428: Foundations of Computer Science I

**Course Description:** Fundamentals of object-oriented programming. Introduction to abstract data types (ADTs) including lists, stacks, and queues. Searching and sorting. Pointers and dynamic memory allocation. A continuation of CS 1428.

**Course Objectives:**

At the end of the course, the students should be able to:

1. Describe and demonstrate at least two different algorithms for searching and at least two different algorithms for sorting.
2. Implement a divide-and-conquer algorithm to solve an appropriate problem (binary search).
3. State the time/space efficiency of various algorithms (using one of 6 categories of mathematical functions).
4. List the 6 categories of mathematical functions used in analyzing algorithms in order from slowest to fastest growing.
5. Read and write C++ code that uses pointer variables and memory operations (new, &

- \*, delete), including pointers to arrays, structures, and objects and the -> operator.
6. Write C++ code that resizes an array using dynamic memory allocation.
  7. Write C++ code that deletes dynamically allocated memory to avoid memory leaks.
  8. Describe the basic concepts of object-oriented programming.
  9. Design, implement, test, and debug simple programs (using objects) in an object-oriented programming language (C++).
  10. Describe how the class mechanism supports encapsulation and information hiding.
  11. Develop (implement) programs using multiple classes and arrays of objects
  12. Develop and use appropriate algorithms, especially for processing lists (insert, remove, search, sort, etc.)
  13. Describe structured programming in terms of modules and functions.
  14. Develop (implement) programs with source code separated into multiple files, including header (.h) files
  15. Create, compile, and run a C++ program in a unix style command-line environment
  16. Develop (Implement) C++ programs that create and use simple linked-lists, including code to insert into, delete from, and traverse a linked list structure.
  17. Compare and contrast the costs and benefits of dynamic and static data structure implementations.
  18. Describe the principle of the Abstract Data Type (ADT) and, in particular, explain the benefits of separation of interface and implementation.
  19. Implement user-defined data structures in a high-level language.
  20. Implement the list, stack, and queue ADT using arrays and linked lists.
  21. Write programs that use each of the following data structures: linked lists, stacks, and queues.

<b>Grading:</b>	Attendance:	3%	28 days total, 3 excused
	Quizzes:	5%	7 total, lowest dropped
	Programming Assignments:	22%	7 total, lowest dropped
	Exam 1:	20%	Feb 29 (Mon)
	Exam 2:	20%	Apr 18 (Mon)
	Final Exam (comprehensive):	30%	Wed, May 11, 2:00-4:30PM

**Attendance:** I will record attendance every day. There are 28 class days. Your first 3 absences do not count against you (I will calculate the average out of 25).

**Quizzes:** Quizzes are announced during the previous class and will count for 5 points each.

**Makeup Policy:** Missed quizzes and programming assignments cannot be made up. Exams may be made up in exceptional circumstances, with approval from the instructor.

**Late policy for programming assignments:** see the class webpage.

**Notifications from the instructor:** Notifications related to this class will be sent to your Texas State e-mail account. Be sure to check it regularly.

**TRACS:** We will use the TRACS website for the following:

- Grades (Gradebook2 tool)
  - Programming assignment submissions (Assignments tool)
  - Resources (Lecture slides and code to use in your programming assignments)
- Everything else will be on the class webpage (programming assignments, etc.).

**Withdrawals/drops:** You must follow the withdrawal and drop policy set up by the University and the College of Science. You are responsible for making sure that the drop process is complete.

<http://www.registrar.txstate.edu/registration/drop-a-class.html>

**Last day to drop: March 29, 2016.**

**Classroom Behavior:** The main rule is to not disrupt or distract other students during class. Be respectful.

**Academic Honesty:** You are expected to adhere to both the University's Academic Honor Code as described here: <http://www.txstate.edu/effective/upps/upps-07-10-01.html>, as well as the Computer Science Department Honor Code, described here: [2013 0426 HonestyPolicy CSPPS.doc](#).

- You may work together on your programming assignments. If you submit a program that is the result of working with others, you must list the names of all contributors in the file header. Each student must submit their own program, even if it is the same as another students'.

Note: I do not advise submitting code you did not write yourself. In order to do well on the exams, you must be able to write code on your own, so you must practice this.

- Do not include code obtained from the internet or any other source in your programming assignment (except what is provided by the instructor during the current semester).

The penalty for submitting a program that includes code from the internet or any other source outside of the class will be a 0 for that assignment.

**Accommodations for students with disability:**

Any student with needs requiring special accommodations should inform me during the first two weeks of classes. The student should also contact the office of disability services at the LBJ student center.