

# SYLLABUS

- I. Title: 254 Data Structures and Algorithms
- II. Time and Place: Fall Semester 2014,  
MWF 11:00-11:50 Rohr Science 13;  
Tues. 7:30-9:10 a.m. Library West Hughes Lab  
**Final Examination: Friday, Dec. 19<sup>th</sup> from 10:30 a.m. -1:00 p.m.**
- III. Credit: CSC 254: four units for 4 class sessions per week.
- IV. Instructor: Jeff McKinstry, Ph.D., Professor of Computer Science
- V. Office Hours: Rohr Science 216; phone: (619) 849-2269; email: jeffmckinstry@pointloma.edu
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|-----------|----------------------------------|
| Monday    | 8:30 – 9:20 a.m., 1:30-2:20 p.m. |
| Tuesday   | 9:30 – 10:50 a.m.                |
| Wednesday | 8:30 – 9:20 a.m., 1:30-2:20 p.m. |
| Thursday  | 9:30 – 10:50 a.m.                |
| Friday    | 8:30 – 9:20 a.m., 1:30-2:20 p.m. |
- VI. Texts:  
Nyhoff, L. *ADTs, Data Structures, and Problem Solving with C++, 2<sup>nd</sup> Edition*, Prentice Hall, 2005.  
Nyhoff, L. *Lab Manual to Accompany ADTs, Data Structures, and Problem Solving with C++, 2<sup>nd</sup> Edition*, Prentice Hall, 2006.
- VII. Objectives of the course: At the conclusion of the course the student should understand the following:
- Definition, implementation, and applications of the basic data structures and associated operators; these tools are essential for all computer scientists and programmers and will be used repeatedly throughout your career, therefore you will want to master them.
  - Abstract Data Types (ADT) and their purpose
  - Computational complexity (time and space)
  - Sorting and searching algorithms and their computational complexity
  - Advanced Object Oriented Concepts (inheritance, and polymorphism)
- VIII. Learning Outcomes:
- Students will be able to write correct and robust software.
  - Students will understand the theory of algorithms and computation.
  - Students will understand the interaction between hardware and software.
  - Students will be able to apply their technical knowledge to solve problems.
  - Students will communicate effectively orally and in writing.
- IX. Course Organization: Class time will be used for:
1. Introduction of material in the text to be assigned; **goes quickly; I assume you read the text and take the “Quick Quizzes”**. The text reinforces the lectures. These are necessary for the homework and labs, which prepare you for the exams and for work in the real world and graduate school.
  2. Discussion of assigned material in the text.
  3. Discussion of student questions on the test or class material, including exercises attempted.
  4. Administering tests.
  5. Laboratory projects (Only 1 lab session per week)
- X. Attendance: See the College Catalogue for a complete statement.

XI.	<u>Student Evaluation:</u>	
	Laboratory Projects	30%
	Homework/in-class assignments	10%
	3 Exams	30%
	Term Project	10%
	Final Exam	20%

Late assignments will be worth 70% if turned in after the class period in which they are due, and are not accepted if late by more than 7 days.

Computer programs will be evaluated according to the instructions in the lab manual. But the expectations are that your program 1) works correctly on all test data; 2) is well documented with comments, and 3) is written in appropriate programming style.

You will be required to **email a zip file to the grader with all source code and the executable file** for all programming assignments.

Grades will be determined as follows:

93-100%	A
90-92%	A-
87-89%	B+
83-86%	B
80-82%	B-
77-79%	C+
73-76%	C
70-72%	C-
67-69%	D+
63-66%	D
60-62%	D-
0-59%	F

The term project can be of your choosing, but must be related to the material in the course, and it must involve **writing a large computer program in C++**. Term projects are expected to be individual projects, unless you clear it with the prof. You may choose to significantly extend one of the programming assignments, or pick your own programming project. A truly ambitious student might want to do a little research into some area of computer science related to the course, find out what the state-of-the-art is by reading journal papers, and experiment with one or more algorithms. See the professor for ideas. It is wise to seek approval for your project before beginning.

XII. Academic Accommodations:

All students are expected to meet the minimum standards for this course as set by the instructor. Students with learning disabilities who may need accommodations should first discuss options and services available to them in the Academic Support Center (ASC) during the first two weeks of the semester. The ASC, in turn, will contact professors with official notification and suggested classroom accommodations, as required by federal law. Approved documentation must be provided by the student and placed on file in the ASC prior to the beginning of the semester.

**Tentative schedule**

**Assignments are listed on the day assigned. Assignments are due the next class period after assigned.**

	Monday	Tuesday	Wednesday	Thursday Lab	Friday
9-1	<b>Labor day</b>		Overview && C++		Ch 4.
9-8	C++	First C++ lab	Ch 4.5, Exercises 1-12		Ch 6
9-15	Ch 6	Lab 2.2 & Project 2.2	Ch 6.5 Ex. 1-18, 20, 21		Ch 7
9-22	Ch 7	Lab & Project 4.1	Hmk 7.4: 1,2,3,4 7.5: 1-41 odd, 69-75 odd		Ch 8
9-29	Ch 8 Hmwk 8.3:1-8	Lab & Project 5.1	Ch 9		<b>Exam: Chapter 4, 6, and 7.</b>
10-6	Ch 9	Lab & Project 6.1	Ch 9		Ch 9 Hmwk: 9.4 all
10-13	Ch 10	Lab & Project 7.1	Ch 10 Ex 10.4 1-13		Ch 10 Ex. 10.6 1-4
10-20	Ch 11	Project 7.2	Ch 11 Ex. 11.3 1-8, 25 11.4 1,4 11.5 6,14		<b>Fall Break</b>
10-27	<b>Exam: Chapter 8 and 9.</b>	Lab & Project 8.1	Ch 12		Ch 12 Ex. 12.2 1-12 12.3 10,14 12.4 12-19
11-3	Ch 12 Hash tables Ex 12.7, 1-8	Lab & Project 9.1	Ch 13 Sorting		Ch 13 Sorting
11-10	Ch 13 Sorting 13.2 #1-11 13.4 #1-3 13.5 #1-3	Lab & Project 10.1	Ch 14 OOP		Ch 14 OOP 14.5 1-3
11-17	Ch 15	Project 5.2	Ch 15		Ch 15
11-24	<b>Exam: Chapters 10-12</b>	Lab & Project 11.1	<b>Thanksgiving</b>	<b>Thanksgiving</b>	<b>Thanksgiving</b>
12-1	Ch 16	Lab & Project 12.1	Ch 16		Ch 16 Ex 16.2, 1-10, 16, 23
12-8	Catchup day	Programming Assessment	<b>Term project Presentations</b>		<b>Term Project Presentations</b>
12-15					<b>Final Exam 10:30-1:00</b>