

# Point Loma Nazarene University

## CSC 252/254: Data Structures

252 – 2 units    254 – 4 units  
Fall 2016

### PLNU Mission

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

### Instructor:

Dr. Benjamin Mood  
[bmood@pointloma.edu](mailto:bmood@pointloma.edu)  
619 849 2269  
RS 216

### Meeting Times and Locations:

#### Lecture:

M/W/F:            10:55AM – 12:05PM            Rhor Science 13

#### Lab:

R:                    7:25AM – 9:10AM                Library West 220 (Breese lab)

### Office Hours:

Monday: 1:00 – 2:30  
Tuesday: 12:30 – 3:00  
Wednesday: 1:30 – 2:30  
Thursday: 12:30 – 3:00  
Friday: 1:30 – 4:00

### Books:

**CSC252/254:** *C++ for Java Programmers* by Mark Allen Weiss  
**CSC254:** *Data Structures and Algorithm Analysis in C++* by Mark Allen Weiss

### Course Description:

CSC252-Students transition to the C++ language and are introduced to additional data structures, including queues, stacks, trees, and graphs considering their implementation with both arrays and linked lists. Concepts are reinforced through weekly programming assignments. Lecture three hours and laboratory two hours each week (this is a quad class). Annually CSC252 is the first quad of CSC254.

CSC254-Standard data structures, including queues, stacks, trees, and graphs, as objects are defined and illustrated with associated dynamic storage management mechanisms. Introduces formal techniques to support the design and analysis of algorithms, focusing on both the underlying mathematical theory and practical considerations of efficiency. Topics include measuring the complexity of recursive and iterative algorithms, algorithmic strategies, the concept of intractability

and the theory of NP. Emphasis is placed on non-numerical algorithms such as sorting, searching, graph and network algorithms both sequential and parallel. Concepts are reinforced through weekly programming assignments. Lecture three hours and laboratory two hours each week.

### **Learning Outcomes:**

Students will be able to write correct and robust software.

Students will use the theory of algorithms and computation to solve problems.

Students will be able to apply their technical knowledge to solve problems.

Students will be able to speak about their work with precision, clarity and organization.

Students will be able to write about their work with precision, clarity and organization.

Students will collaborate effectively in teams.

Students will be able to gather relevant information, examine information and form a conclusion based on that information.

Students will be able to understand and create arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats.

(CSC254 Only) Students will analyze the interaction between hardware and software.

### **Department Mission:**

The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

### **Additional Course Information:**

**Lectures:** Most days will have a lecture as part of the class. There will be in-class work from during some of the lectures. Readings should be done before the lectures so students have an opportunity to think about any questions they will want to ask.

**Missed Classes:** Labs missed due to PLNU activities (i.e., sports teams, choirs, etc), should be turned in the next lab the student is back. Missed Exams must be scheduled before the student leaves (exception is dire circumstances). It is the student's responsibility to inform the professor of when they will be gone. In-class work will be waived for excused events.

**Labs:** Labs are used to give students a way to practice the concepts studied in lecture. They will be composed of a practical and a theoretical (written) section. The practical part of the lab must be demonstrated to Dr. Mood or a lab assistant to show that it works successfully. A completed lab includes the signed off practical sections, answers to the theoretical questions, and a printout of all code and necessary data files. It should be well commented.

There are two parts to the practical part of the lab, a "prep" lab and "main" lab. Students are required to complete the prep lab in lab before working on the second half of the lab and before talking to anyone else about the lab other than the Dr. Mood and the lab assistants. After the prep lab is complete, students may talk to each other about the remainder of the lab, but each person's code should be their own and each student should completely understand the code they are turning in.

During the week there is 1 lab period and 1 session of lab hours where a lab assistant will be available to answer questions or sign off on the lab. Students may also come by Dr. Mood's office hours to ask questions and/or request their lab to be signed off.

Labs should be turned in by the start of the next lab (~7:40am). I am not planning on accepting late labs. Partial credit will be given, so please turn in whatever is done.

**Cheating:** If you use online resources, you must site the direct URLs in the labs you turn in. You should not copy another student's work. You should not copy code from online (exception: looking up how to call functions or use built-in classes.). Unless otherwise noted, talking and working with fellow students to understand concepts is OK. If you are concerned, simply ask myself or the lab assistant for help.

Rule of thumb: everything you turn in you should be able to completely explain. Meaning, if I call you into my office to explain your work, you should be able to.

**Final:** There is both a final and midterm for this class. Both of these are cumulative. The final time is Wednesday 10:30am – 1:00pm.

**Cell Phones & Laptops:** Please don't use them in class.

**Be Courteous and Respectful.**

**Grading:**

	<b>CSC254</b>	<b>CSC252</b>
In-classwork	10%	15%
Labs	45%	45%
Exams	15%	15%
Midterm	10%	25%
Final	20%	----

**Grading scale**

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 – 67%	D
60 – 62%	D-
0 – 59%	F

## **PLNU Policies**

### **Attendance:**

Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day.

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See

[http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class\\_Attendance](http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class_Attendance) in the Undergraduate Academic Catalog.

### **Class Enrollment:**

It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

### **Academic Accommodations:**

If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at [DRC@pointloma.edu](mailto:DRC@pointloma.edu). See [Disability Resource Center](#) for additional information. For more details see the PLNU catalog:

[http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic\\_Accommodations](http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Accommodations)

Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

### **Academic Honesty:**

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See [http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic\\_Honesty](http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Honesty) for definitions of kinds of academic dishonesty and for further policy information.

### **Final Exam: 12/14 at 10:30am**

The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.

**Copyright Protected Materials:**

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

**Credit Hour:**

In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 4 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

**Schedule**

Monday	Tuesday	Wednesday	Thu	Friday
Aug: 29	30: Class Intro Chapter 0	31: Chapter 1	Sept: 1 Lab: Visual Studio & First Programs	2: Chapter 2
5 (No Class) Labor Day	6	7: Pointers Chapter 3.0 – 3.3	8 Lab: Functions, Parameters, Arrays, vectors, Strings	9 3.4 – 3.6
12 Classes Chapter 4.0 – 4.5	13	14 Classes Chapter 4.6	15 Lab: Fun with Pointers	16 Classes Chapter 4.7 – 4.17
19 Operator Overloading Chapter 5	20	21 Review Day	22 Lab: Classes	23 <b>Exam</b>
26 Inheritance Chapter 6	27	28 Templates Chapter 7	29 Lab: Inheritance	30 STL Containers Chapter 10
Oct: 3 STL Algorithms 10.8-10.11	4	5 File IO Chapter 9	6 Lab: STL Containers & Templates (Maps)	7 DS Chapter 2
10 Review: Stacks & Queues New: Trees, DS 4.0-4.1	11	12 DS 4.2-4.3	13 Lab: Tree Lab	14 DS 4.4-4.6
17 Review Day!	18	19 <b>Midterm/Final</b>	20 Lab: TBD New lab for	21 (No Class) Fall Break

			CSC254 only	
24 Hashing DS Chapter 5	25	26 DS Chapter 7, Insertion sort,	27 Hashing Lab	28 Merge sort/ Quick sort
31 Bucket Sort, Radix sort	Nov: 1	2 DS Chapter 9.1 – 9.3	3 Sorting Lab	4 DS Chapters 9.4 – 9.5
7 Chapter 9.7	8	9 More Graphs & NP	10 Graphs Lab	11 More Graphs & NP
14	15	16 Review Day!	17 Lab: Bin Packing	18 <b>Exam</b>
21 10.1	22	23 (No Class) Thanksgiving	24(No Class) Thanksgiving	25 (No Class) Thanksgiving
28 10.2	29	30 10.3	Dec: 1 <b>Programming Quiz</b>	2 10.5
5 Bitwise Operations	6	7 TBD	8 Lab: Divide and conquer	9 Review Day!
12	13	14	15 <b>FINAL</b>	16

