

CSIS 3103: Data Structures Spring 2017 -- Syllabus

Instructor:	Dr. Vincent Cicirello	Office:	G-116
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Office Hours: Mondays/ Wednesdays: 10:45am -- 12:15pm
Available other times by appointment; drop-ins welcome (if I'm there, I'd be happy to talk to you).

Course Time and Location:
Mondays: 2:10-3:25pm (D027)
Wednesdays/Fridays: 2:10-3:25pm (B002)

Course Description: Advanced topics in the specification, implementation, and use of important data structures and associated algorithms. Data structures to be studied include stacks, queues, lists, trees, heaps, priority queues, sets/maps, and hash tables. Algorithm analysis is also studied, with emphasis on searching and sorting. Programming projects provide experience using the concepts covered in the course.

This course is a Q2 (Quantitative Reasoning across the Disciplines).

Course IDEA Objectives: The IDEA objectives of this course include:

- **IDEA learning objective 2:** Learning the fundamental principles, theories, and concepts of organizing data for efficient and reliable storage and access;
- **IDEA learning objective 3:** Learning to apply these principles, theories, and concepts to solve software design problems;
- **IDEA learning objective 4:** Developing skills and competencies in the implementation of classic data structures and their associated algorithms in the Java language, in the application of Java's collections framework, as well as developing skills in using the Eclipse integrated development environment (IDE), an IDE that is widely used in industrial settings; and
- **IDEA learning objective 11:** Learning to analyze and critically evaluate alternative data structures and their implementations based on their effectiveness and appropriateness for various problem domains.

Prerequisites: Grade of C or better in CSIS 2102 (Programming & Problem Solving II) and MATH 2225 (Discrete Math)

Required Textbook: *Data Structures: Abstraction and Design Using Java*, 2nd Edition, by Koffman & Wolfgang, © 2010 Wiley, ISBN: 978-0-470-12870-1.

Other Required Resources:

- Up to date Java: <http://www.oracle.com/technetwork/java/javase/overview/index.html>
- Eclipse IDE for Java Developers: <https://eclipse.org/downloads/eclipse-packages/>

Grading:	Participation	3%
	Lab Assignments, Written Homework Exercises	14%
	Programming Assignments	33%
	2 Exams (25% each)	50%

Grading Scale: Grade ranges begin as follows:
 A: 90.00, A-: 89.00, B+: 88.00
 B: 80.00, B-: 79.00, C+: 78.00
 C: 70.00, C-: 69.00, D+: 68.00
 D: 60.00, D-: 59.00, F: less than 59.00
 I occasionally adjust these at the end of the semester based on overall class performance.

Participation: Attendance is expected, but I do not explicitly factor attendance into your participation grade. There's no reason to document absences unless you are absent for an extended period. Any contributions that positively impact class will increase your participation grade. Likewise, anything that negatively impacts class will decrease your participation grade. Examples of the latter include ringing cell phones, noisily arriving late, noisily leaving early, etc.

Exam 1, Exam 2: The exams are not cumulative. For each exam you are allowed one sheet of notes (can use both sides) on a piece of paper no larger than 8.5" by 11" (letter sized paper). No other resources are allowed during exams.

Programming Assignments, Lab Assignments, and Written Homework Exercises:

- **Programming Assignments:** The programming assignments in this course will be more involved than those in either of the courses of the programming and problem solving sequence. There will be approximately 5 programming assignments. The time allotted to each will generally be 2 weeks, but may vary depending upon the amount of work required. For most programming assignments, you will be required to work independently. For other assignments, you will have the choice of either working independently or with one other student. I will indicate explicitly for each assignment whether you have the option to work as a pair. For those assignments where you work as a pair, both receive the same grade on that assignment.
- **Lab Assignments:** Some smaller assignments will be designed such that it will be possible (though not guaranteed) that they can be completed within a single lab period. There will be approximately 5 of these. All "lab" assignments can be worked on either independently or as a pair. For those lab assignments that are not completed within the allotted lab time, you will be expected to complete them within a week.
- **Written Homework Exercises:** Written homework assignments will include problems, exercises, and review questions from the end of chapters of the book. The written homework exercises must be done individually.

Due Dates: Programming assignments and lab assignments will be due electronically via Blackboard and will be due by midnight on the dates due. Written homework exercises will be due by class time either on paper or electronically. Late assignments will be penalized by 25% if less than 24 hours late, 50% if less than 48 hours late, 75% if less than 72 hours late, and by a grade of 0 if more than 72 hours late. **The first time an assignment is late (within 72 hours), the late penalty will be waived.**

Academic Honesty: Please familiarize yourself with Stockton's policy on academic honesty. Each violation will result in a grade of 0 for the assignment, exam, etc involved, as well as a 10 point penalty on your overall course grade. Note that you are allowed (and encouraged) to discuss assignments with other students, and you are allowed (and encouraged) to offer guidance. Peer tutoring is an effective method of both parties strengthening their understanding of concepts. However, don't share code directly with other students. Copying source code files from any source is considered plagiarism, and possibly also a violation of the author's copyright. Submissions may be checked by automated software.

Make-Up Exams: Make-up exams in general will not be given (i.e., if you miss an exam, you get a 0). The only exceptions to this rule are the following:

- 1) Documented medical excuse: please provide documentation when you return to class either directly to me or to the Wellness Center.
- 2) Other institutional excuses: There may be situations related specifically to Stockton that prevent you from being able to attend an exam (e.g., an away game for a Stockton team that you are on, a fieldtrip for a Stockton course, etc). In most such cases, you should be aware of the conflict beforehand. Thus, I must be notified of this conflict one week prior to the missed exam, with written documentation (e.g., letter from Stockton coach or Stockton sponsor of field trip, etc).

Incomplete Policy: In general, no grades of incomplete will be given. The only exception to this rule is an institutionally documented medical emergency that necessitates your absence from Stockton for a period greater than two continuous semester weeks. Additionally, you must be caught up on all work up to the point where your medical emergency began and currently in the "C" range or better overall at the point when emergency began.

Tentative Schedule: This schedule is subject to change during the semester. Changes will be announced in class.

Date	Textbook	Highlight	Topic
January 18	Appendix A, Chapter 1		Course Intro; Java Review
20	Chapter 1		Java Review
23	Chapter 1		Java Review
25	Chapter 1		Java Review
27	Chapter 1		Java Review
30	Chapter 1		Java Review
February 1	Chapter 2		Lists
3	Chapter 2		Algorithm Efficiency and Big-O
6	Chapter 2		Java's Collections Framework
8	Chapter 2		Single-Linked Lists
10	Chapter 2		Double-Linked Lists and Circular Lists
13	Chapter 2		List Iterators
15	Chapter 3		Stacks
17	Chapter 3		Stacks
20	Chapter 3		Stacks
22	Chapter 4		Queues
24	Chapter 4		Queues
27	Chapter 4		Queues
March 1	Exam Review		Exam Review
3	EXAM 1	EXAM 1	EXAM 1
6	Chapter 5		Recursion
8	Chapter 5		Recursion
10	Chapter 5		Recursion
13	NO CLASS	Spring Break	Spring Break
15	NO CLASS	Spring Break	Spring Break
17	NO CLASS	Spring Break	Spring Break
20	Chapter 6		Trees
22	Chapter 6		Trees
24	Chapter 6		Trees
27	Chapter 6		Binary Trees, Heaps, Priority Queues
29	Chapter 6		Binary Trees, Heaps, Priority Queues
31	Chapter 6		Binary Trees, Heaps, Priority Queues
April 3	Chapter 7		Sets and Maps
5	NO CLASS	Advising Day	No Class (Advising Day)
7	Chapter 7		Sets and Maps
10	Chapter 7		Sets and Maps
12	Chapter 7		Hash Tables
14	Chapter 7		Hash Tables
17	Chapter 7		Hash Tables
19	Chapter 8		Sorting
21	Chapter 8		Sorting
24	Chapter 8		Sorting
26	Chapter 8		Sorting
28	Exam Review		Exam Review
May 1	NO CLASS	Reading Day	University Reading Day
3	NO CLASS	NO CLASS	NO CLASS
5	EXAM 2	EXAM 2	EXAM 2: Special Time: 2:30-4:30