CSC-220 Data Structures and Algorithms Syllabus

<table>
<thead>
<tr>
<th>Course No / Name</th>
<th>CSC-220 / Data Structures and Algorithms</th>
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</thead>
<tbody>
<tr>
<td>Lab Number</td>
<td>CSC-220L  (MUST ENROLL IN LAB!)</td>
</tr>
<tr>
<td>Credits</td>
<td>3 + 1 Credit Lab</td>
</tr>
<tr>
<td>Date</td>
<td>Modified 08/11/16 for the Fall 2016 Semester</td>
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<tr>
<td>Instructor</td>
<td>Prof. Antonio C. Silvestri</td>
</tr>
<tr>
<td>Office</td>
<td>17/415</td>
</tr>
<tr>
<td>Phone</td>
<td>755-4621  (Use email whenever possible.)</td>
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<tr>
<td>E-Mail</td>
<td><a href="mailto:silvestri@stcc.edu">silvestri@stcc.edu</a></td>
</tr>
<tr>
<td>Web-Page</td>
<td><a href="http://cs.stcc.edu/category/csc-220/">http://cs.stcc.edu/category/csc-220/</a></td>
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</table>

Course Description

Course provides a survey of classic data structures. Content includes methods of analysis applied to algorithms that manipulate dynamic and static data structures. Object-oriented programming techniques are utilized to implement lists, trees, queues, and other structures using the Java language. Algorithms focus on sorting and searching methods, as well as recursive solutions.

Prerequisites: CSC-111; MAT 125

Corequisites: CSC 220L

This course is designed for those students interested in transferring to a four year college or university. Consequently, the student must be prepared to invest much time and effort for successful course completion.

Required Textbook and Materials

Introduction to Java Programming, Comprehensive Version, 10/E
Y. Daniel Liang
ISBN-10: 0133761312
Publisher: Prentice Hall
Copyright: 2015

Rent electronic version of textbook for 180 days: http://www.coursesmart.com/introduction-to-java-programming-comprehensive/y-daniel-liang/dp/9780133761658

The textbook comes with a code for online access to the textbook's site. If you have a book and want access to the companion site, the ISBN is 0133767175.

Course Policy

WEBSITE: In an effort to implement distance learning, course files will be placed on the Internet. Homework and lab
assignments, solutions, and class announcements can be accessed using the web. Access the STCC Computer Science Web page using the URL:

http://cs.stcc.edu/category/csc-220/

All course announcements and correspondence will be done through this site. It is your responsibility to visit this site at least once every two days to view the latest course announcements, homework, and news. To simplify the process, press Ctrl-D to bookmark the site in your browser.

HOMEWORK: Homework will be assigned after a major topic has been developed. The homework will consist of a programming assignment that reinforces a topic discussed in lectures. Each assignment has equal weight. Ten or more assignments will be assigned. To receive credit for homework, source code and executables must be posted on the student's web site. Homework is to be a reflection of things learned in class and lectures. While you can certainly ask the instructor some questions on homework assignments, excessive questioning of the instructor on homework does not reflect well on your grasp of the material. There have been times in the past where students questioned and questioned the instructor to the point where the program they submitted was really something the instructor wrote. The instructor in reality should have been awarded the A on the assignment. So please understand that in the interest of fairness to others in the class, excessive questioning will result in a reduction of the grade earned on the assignment.

At the start of each source listing, a global comment identification section containing the following information must be included:

1. Your name
2. Date
3. Course Name and Number
4. Problem Number
5. Short Description of the Problem
6. The email address where you can be reached.

Missing 2 assignments will be grounds for dismissal from class. Late homework cannot be accepted as solutions to the homework are routinely given as part of lectures.

LABORATORY WORK: Laboratory work is optional in this course. This doesn't mean that homework is optional; it merely means that you are not required to attend lab.

ATTENDANCE: Attendance is required; a student is expected to attend all scheduled classes. Missing 6 classes or the equivalent of 2 weeks of lecture will be grounds for class dismissal. Students who arrive late to a class and miss the attendance call will be considered absent. Any benefit of the doubt in the final grade will be given to students who come to class regularly. You will find each class contains much material. If you miss a class, do not expect the instructor to review missed material. It is your responsibility to get the lecture notes from a fellow student. Check the website for any materials discussed in class.

CELL PHONE POLICY: Turn it off, please! Cell phone use of any kind (i.e., as phone, calculator, camera, etc.) is prohibited in class or lab unless an emergency situation exists which requires the student to be available by phone. In those rare instances, the phone should be placed on vibrate; the student will momentarily excuse himself/herself from class and handle phone calls outside of the room.

LAPTOPS: Students may use laptops in class to take notes, but may not use them in any way on exams. The instructor reserves the right to suspend or ban laptop use if, as determined by the instructor, any student is using a laptop inappropriately or to the detriment of other students.

CHEATING POLICY: While student interaction on the solution of homework problems and labs is encouraged, blatant cheating and/or copying on homework and lab assignments will not be tolerated and will result in a 0 grade for the assignment in question for all participants. Dismissal from the class can also be an option depending on the severity of the incident.

If the instructor senses a problem with an assignment, perhaps the assignment was not the students' work, the instructor reserves the right to question the student to have them prove they did the work.

GRADING POLICY:
<table>
<thead>
<tr>
<th>Activity</th>
<th>Weight</th>
<th>Additional Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Homework</td>
<td>40%</td>
<td>Each assignment has equal weight. 8 or more assignments will be assigned. Missing 2 assignments will be grounds for dismissal.</td>
</tr>
<tr>
<td>Mid Term Exams</td>
<td>40%</td>
<td>4 or 5 Exams of Equal Weight.</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
<td>Consistent good work is rewarded. Any student with an A average of ALL exams and homework at the end of the semester will not need to take the final!!! All exams and homework must be taken in order to qualify for this reward.</td>
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Based on the percentages in the table above, an overall grade will be calculated. That grade will be entered for both the 3 credit lecture and 1 credit lab.

Exams can be either a multiple choice type exam or in-lab problem solving exam where a programming problem is proposed and the student will write a program solution. When an in-lab programming exam is scheduled, you required to use the Eclipse IDE and the command line java utilities, `javac`, `java`, and `appletviewer`. While there are a multitude of ways to build your programs, our lab is only equipped with these utilities.

Suggestions on How to do Well in this Class

1. Keep a notebook either paper or electronic and take the best possible notes at each lecture. Some lecture material may not be fully discussed in the text. Also, problem solutions are performed routinely in the lectures.
2. **Start your assignments immediately after they have been assigned!!!** It is unfortunate that students tend to put off working on their assignments until the day before it is due. Their work is usually substandard and their grades reflect it.
3. In order to receive credit for an assignment, you must submit something that shows you were near a solution. The worse thing you can do is submit nothing. Nothing is the equivalent of a zero, and we all know what a zero can do to an average.
4. Give a good effort to solving homework problems. Take the time to thoroughly understand the homework since it is through these assignments that you will understand the subject matter.

Course Syllabus and Objectives

(Please see your book's Table of Contents for specific chapter details)

- Review of Arrays
- Chapter 9 Objects and Classes
- Chapter 10 Object-Oriented Thinking
- Chapter 11 Inheritance and Polymorphism
- Chapter 12 Exception Handling and Text I/O
- Chapter 13 Abstract Classes and Interfaces
- Chapter 17 Binary I/O
- Chapter 18 Recursion
- Chapter 19 Generics
- Chapter 20 Lists, Stacks, Queues, and Priority Queues
- Chapter 21 Sets and Maps
- Chapter 23 Sorting
- Chapter 24 Implementing Lists, Stacks, Queues, and Priority Queues
- Chapter 25 Binary Search Trees
- Chapter 28 Graphs and Applications