CSCI 270   **Data Structures (Online)**
Fall 2014

Instructor:	Sandy Huerter (pronounced HER-ter)
Office:	JOUR 211 (follow the hallway to the left of JOUR 222 or to the right of JOUR 218)
Phone:	903-886-5494 (CSci Dept. Office in JOUR 122-124 is 903-886-5409)
Email:	Sandy.Huerter@tamuc.edu

Office Hrs:
M 2:00pm – 3:00   If I'm not in my office during office hours, look for a note on
T 1:00pm – 4:15 *   the door. If there's no note, you can check with the CSCI dept
W 2:00pm – 3:00   secretary in Jour 122-124 to be sure I'm on campus. Unless I'm
R 1:00pm – 4:15 *   sick that day, I'm probably on my way and will be there as soon
or by appointment   as I can.
*Note: On T & R I have a 151 lab 2:00-3:15 and may be in Jour 200 rather than my office.

Course Description:
This course continues with the concept of abstract data structures (classes) begun in 152 and concentrates on building programming tools known as container classes which can be used to store and manipulate data. Topics covered include address variables, linked lists, stacks, queues, recursion, analysis of algorithm efficiency, binary search trees, and hash tables.

Student Learning Outcomes:
(measured by exam and program assignment results)

After completion of this course, you will be able to create and use classes to implement the basic data structures (stacks, queues, linked lists, trees, and hash tables) and to use predefined classes from the Standard Template Library. You will be able to design and code a program for application areas in which these data structures would be useful. Given multiple algorithms to solve the same problem, you will be able to estimate which algorithm would be more efficient in terms of time and memory required.

- Use address variables.
- Use the linked list data structure.
- Use the stack data structure.
- Use the queue data structure.
- Design, code, and use recursive functions.
- Understand Big-O notation (for algorithm efficiency): what it means, how it is determined, and why it should be considered in effective programming.
- Use the binary tree data structure and a hash table.
- Integrate the use of container classes (user-created or STL) into a moderately complex program solution.

Prerequisite: CSci 152 (basics of the C / C++ language and an introduction to C++ classes)

Recommended Text: C++ Plus Data Structures 5th edition
by Nell Dale   ISBN: 9781449646752

or   C++ Programming: from Problem Analysis to Program Design **5th edition**
by D.S. Malik   ISBN: 9780538798082

or   C++ Programming: from Problem Analysis to Program Design **6th edition**
by D.S. Malik   ISBN: 9781133626381

A copy of the 5th edition of the Malik text is on reserve in the university library.

A file of information about sources for textbooks was emailed to you a couple of weeks before the beginning of the semester. That file is also available for download: in eCollege, click on Doc Sharing in the toolbar at the top of the screen. On the Doc Sharing screen, scroll down to the bottom of the screen. Download the textbook information by clicking on the filename (in blue). You'll be given the option of saving the file or opening it. If you select open, the file will open up in Microsoft Word; you can then save the file in Word.

Online Resources:

Some particularly recommended sites for compiler information, tutorials, and general how-tos:

http://www.course.com/malik/cpp/   (author's website)

http://www.cprogramming.com/

http://www.cplusplus.com/

http://msdn.microsoft.com/en-us/visualc/default.aspx

http://www.aihorizon.com/essays/basiccs/

Evaluation:

Details of **program requirements** will be provided in a separate handout **General Policy for Programming Assignments** (available in eCollege Doc Sharing). Details of the Current Events Discussions will also be provided in a separate handout. We'll start Current Events in week 3.

Your grade for the course will be based on the following approximate percentages:

65%	Exams (3)
5%	Online Review Quizzes
20%	Programs (probably 5-6)
10%	Current events discussions (social, ethical, security issues in computers and technology)

Format for the exams will typically be approximately half coding (usually small sections of code such as functions, parts of functions, or calling a function) and half analyzing the effects of executing code (for example, describing output, completing diagrams to show values assigned, etc.) or multiple-choice/true-false/short-essay questions about the behavior of the data structures being studied.

A **study guide** will be provided for each exam, listing topics to be covered (or omitted) and recommending selected problems from the text from which many of the exam questions will be derived. Answers for these problems are available for downloading from eCollege Doc Sharing.

An optional **makeup exam** will be given toward the end of the semester.   This makeup exam will include material from the first two exams, and the makeup exam grade can be used to replace either of the first two exams. This makeup exam will be in multiple-choice, true/false, and short answer format with minimal coding required.

Exams will be on paper and in person. For those at Navarro, I'll see about making arrangements for you to take the exam on your campus. I will be checking a little closer to the first exam date to see if arrangements need to be made for any students not in Commerce or at Navarro.

Letter grades for the course will be assigned according to this scale of percentage points:

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

You must earn an A on your own. Assuming that you have completed all assignments, lower borderline grades may be affected by factors such as:
- the class grade distribution
- your class participation

You need to give me a reason to think you deserve a grade higher than your percentage indicates and that you've made every effort to help yourself (you're at least attempting programs, correcting programs, and participating in the current events discussions).

Course Policies

Makeups:
If you miss one of the first two exams, the makeup exam will be used to replace the missing grade. If you know ahead of time that you have a problem with an exam time, let me know as soon as possible.

Drops:
If you are making an obvious effort in the course at the time you drop (still attempting program assignments and participating in current events discussions), you may drop passing no matter what your actual grade might be.   If you just disappear, your grade will be whatever you have actually earned at the end of the semester (usually a grade of F). If you find that you are unable to complete the course, please be sure to drop the course to avoid receiving an F; you will not be automatically dropped.

eCollege:

This is an *online* course, so you will need to be able to access eCollege in order to access the course.

You can access eCollege either directly or through your myLeo account.

1. To access eCollege through myLeo, log on to your myLeo account and click on **eCollege** in the bar in the upper right of the screen under the myLeo logo (there may be an additional link available in the menu on the left side of your screen). You can bypass the university's home page by going to **http://online.tamuc.edu**

or To connect to eCollege directly, set your browser to go to **http://online.tamuc.org/**
Enter your student id in the User Id box at the top of the screen where the cursor is blinking and enter your password in the Password box to the right of the User Id box (it's the same id and password that you use when logging in to your myLeo account). Click on **Sign In** .

As long as eCollege itself is up, you can connect to eCollege this way even when myLeo is down or the university's home page is inaccessible.

2. In eCollege click on the **MyCourses** tab (next to **Home**) in the upper left corner of the screen between the university logo and the date.

3. Scroll down to the bottom of the MyCourses screen and click on the class you want from the list of online and web-enhanced courses you may be taking this semester.

eCollege Announcements:
The course home page (the first page once you get into a specific course) contains an **Announcements** box. As we progress through the semester you'll find an announcement for each week. It will contain a copy of the email I will try to get sent every weekend to tell you about stuff that is due as well as new assignments for the week, and where to find everything you'll need. There may be additional announcements as needed, so get in the habit of checking there every time you connect in to eCollege. Click on an announcement name (or on the + sign to the left of the name) to open and view the file.

Please check the eCollege Announcements frequently.

eCollege Document Sharing:

Input data files, sample programs, class notes, textbook powerpoints, and any other documents you need will be located in Doc Sharing. Click on **Doc Sharing** in the toolbar at the top of the screen. The files will be organized according to topic; files not associated with a particular chapter will be listed under the default category of the course name.

In the **Categories** box, click on the category (folder) you want. Then in the box below (title is the category selected), click on the name of the file to be downloaded. You're given the option of saving the file or opening it directly in its application program (most are Word 2003 files, so the document will be opened in Word) and then saving it if you wish to keep a copy of it.

Compilers:

You will need access to a C++ compiler; any C++ compiler you may have access to is fine for programming assignments for this course.
All of these compilers can be downloaded for free for installation on your own computer:
- Microsoft Visual C++ Express Edition (a more limited but somewhat easier-to-use version of Visual C++)
- Orwell Dev C++.
- Code::Blocks

Orwell DevC++ 5.7.1 – click on the dark green rectangle labeled **Download**
http://sourceforge.net/projects/orwelldevcpp/

Visual Studio Express 2013 (includes C++, C#, Visual Basic, JavaScript, Visual F#):
http://www.microsoft.com/express/vc/

Visual C++ Developer Center (links for how-to videos, tutorials, etc. in addition to downloading):
http://msdn.microsoft.com/en-us/visualc/default.aspx

For some Visual Studio Tips and Tricks, go to:
http://www.cprogramming.com/visual.html

The entire Visual Studio (of which **Visual C++** and the express edition are a part) is available for free download by students enrolled in computer science courses at A&M Commerce. If you don't already have an account from enrollment in a computer science course in a previous semester, an account for downloading free Microsoft products will be set up for each of you after the 12th class day (when enrollments are stabilized). Instructions for downloading from your account are at the top level in eCollege Doc Sharing (Instructions for DreamSpark Software Downloads.doc).

Not currently on Computer Science lab computers, but available for free for your own computer:

Code::Blocks for **Windows** users: **http://www.codeblocks.org/downloads**
or **http://sourceforge.net/projects/codeblocks/?source=recommended**

Code::Blocks for **Linux** users: **http://www.cprogramming.com/g++.html**

XCode for **Mac** users: **http://www.cprogramming.com/xcode.html**

TENTATIVE SCHEDULE

Page numbers in both the Dale and Malik textbooks will be detailed in the weekly emails.

Week	Class Dates	Activity
1	26 & 28 Aug	Introduction and course overview eCollege access demo Review of Two-Dimensional Arrays
2	2 & 4 Sep	Review of Two-Dimensional Arrays Review of Structs
3	9 & 11 Sep	Classes
4	16 & 18 Sep	Overloading, operator functions, and friend functions
5	23 & 25 Sep	Pointer variables & Dynamic Variables
6	30 Sep & 2 Oct	Pointer variables & Dynamic Variables **Exam 1** over classes, overloading, operator and friend functions
7	7 & 9 Oct	Linked Lists
8	14 & 16 Oct	Linked List classes Templates Variations of linked lists
9	21 & 23 Oct	Stacks Stack applications: function calls, postfix notation
10	28 & 30 Oct 30 Oct (Thu)	Stack applications: function calls, postfix notation **Last day to drop a class and remain enrolled in other classes**
11	4 & 6 Nov	**Exam 2** over pointers, dynamic variables, and linked lists Queues
12	11 & 13 Nov	Recursion
13	18 & 20 Nov	Recursion Algorithm Analysis
14	25 Nov 27 Nov	Trees, Binary Search Trees Thanksgiving break – no class
15	2 & 4 Dec 2 Dec (Tue)	Trees, Binary Search Trees Hash Tables **Last day to withdraw (from all classes)**
16	9 Dec	**Exam 3** over stacks, queues, recursion, algorithm analysis, binary trees (this is not a comprehensive final)

University Policies and Announcements

Students with Disabilities:

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library
Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu

"All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment."
(See Student's Guide Handbook, Policies and Procedures, Conduct)

EARLY INTERVENTION FOR FIRST YEAR STUDENTS:

Early intervention for freshmen is designed to communicate the University's interest in their success and a willingness to participate fully to help students accomplish their academic objectives. The university through faculty advisors and mentors will assist students who may be experiencing difficulty to focus on improvement and course completion. This process will allow students to be knowledgeable about their academic progress early in the semester and will provide faculty and staff with useful data for assisting students and enhancing retention. Grade reports will be mailed by the end of the sixth week of the semester.

All students should be aware that plagiarism is a serious offense. This is true not only of written essays but also of work written in computer languages such as C++. Copying code for assignments from other students or the internet is not allowed. You may certainly discuss with one another the general aspects of programming assignments (like "what does this requirement mean?") and strategies for coding solutions for these assignments, but you must write the actual code for the programming assignments on your own.