COURSES   GROUPS   RESOURCES   Mark Mahoney

Data Structures and Algorithms: 01-Mahone ...   Pages

Syllabus

CSC 2560 Data Structures and Algorithms
Dr. Mark Mahoney
Fall 2021
MW 11:45 AM - 1:25 PM
mmahoney@carthage.edu
office phone: (262)551-5869
Office Hours:
DSC 192
TR 2:30 PM - 4:00 PM
W 1:30 PM - 3:30 PM

Prerequisites: CS112

Required Material: An Animated Introduction to Programming in C++ (Mahoney)

Grading Criteria:
Programming Assignments: 70%
Quizzes: 15%
Final Exam: 15%

Course Description:
This course is the third programming course you are required to take at Carthage College as a Computer Science major. In this course I will attempt to teach you techniques that make programming more rewarding and exhilarating and far less demanding, time consuming and frustrating.

We will be writing programs in the C++ language. We will focus on learning several key object-oriented techniques. C++ is an ideal language because it is widely used in industry. The Java and C# languages are also used quite a bit in industry. The syntax of Java and C# is based on C++, so this class should be helpful in learning other languages as well.

The student should come in with a basic understanding of Object-Oriented and Structured Programming, compiling, debugging and running programs. The focus of this course will be to learn how to build and use complex data types in an object oriented language. Many advanced features of the C++ language will also be discussed.

As some of you will soon find out, programming is not for everyone. You must have excellent organizational skills to avoid common errors. It is important to realize that each and every one of you will make errors when writing programs. The people who succeed are those that do not give up easily, those who can spot their own errors quickly and correct them. Not enjoying programming does not preclude you from an interesting challenging career in the field of computer science or information systems. There are many great jobs out there that don't involve programming in C++.

Objectives:
• Use the techniques learned in previous programming courses and extend these techniques to become better programmers.
• Understand the purpose and usefulness of complex data structures.
• Learn how to implement and test complex data structures.
• Be able to analyze the efficiency of data structures, sorting, and searching algorithms.
• Develop an understanding of dynamic memory allocation and the advantages and pitfalls of using it.
• Learn to use exceptions as a technique for dealing with errors.
• Learn advanced object oriented programming techniques.
• Develop good problem solving skills.

Class/General:
We have a lot of information to cover. The use of complex data structures has greatly reduced the complexity of modern software development. In order to become professional software developers it is necessary to learn the skills presented in this course.

It is important that every student watch the videos I have created at least once before they get to class. This is a difficult subject that requires reading and practice. If you do not do both, you will not pass this course. Programming courses in general require a great deal more effort outside of class on the student's part than most other courses. This class will be no exception. If you intend to be a computer science major, this will be one of the most important courses you will take. I expect the student to treat it as such and come fully prepared to participate in class discussions, ask questions and see me outside of class for help if necessary.

This will be a 'flipped' classroom. A flipped classroom is one where the lectures are recorded and the student is expected to watch them before class. Then, in class we will work on problems together. These problems are usually related to the homework assignments. You might think that you don't need to show up if you have watched the video and feel like you have a handle on the topic. However, you would be wrong. So much of what I am expecting comes up in discussion that it makes sense to show up for every single class. You can also see how others tackled a problem or discuss strategies with your peers. Class attendance is required. Repeated unexcused absences will negatively affect your grade.

Computers/Computer Lab:
You must use C++ outside of class. I encourage you to bring a laptop computer into class if you have one. However, do not surf the web.

It would be nice if you have a C++ compiler installed on your personal computer. If you don't have a personal computer than you can use machines on campus to do all the required assignments. I will provide a link to a free C++ compiler that you can install on your own machine or a lab machine.

Class Web Site:
I have created a website for this class to better distribute information. The website will provide each student with access to his or her grades, class announcements and homework assignments.

Programming Assignments:
In order to learn how to build and use complex data structures you must practice outside of class several times a week. Simply attending class is not sufficient to learn the concepts and techniques we will be discussing in class. There will be several programming assignments that are designed to help you learn the concepts discussed in class. Check the 'Assignments' tab for more details.

All assignments must be handed in by midnight on the due date. I do not accept late work. Be sure to hand in whatever work you have completed before the due date. Partial credit is better than no credit. This semester every student will get one 'no questions asked' three day extension and one 'no questions asked' seven day extension for the assignments.

Students are encouraged to help each other learn the material. The exchange of ideas enhances the learning process. However, the final product must be your own. Plagiarism of assignments and cheating on exams are not permitted. Any student caught doing so will automatically receive a failing grade. You can find the student honor pledge here. Plagiarism of source code is notoriously easy to detect, I strongly suggest you don't attempt it.

Read the requirements for each assignment carefully. Ask questions on any portion that is not clear.

If you have a documented disability and anticipate needing any accommodations for this course, please arrange to me with me in the first two weeks of class. You also need to have documentation on file with Diane Schowalter in the Advising Center (x5802.) This information will be kept confidential.