Data Structure

Course Description

A thorough study of standard structures used in the storing and retrieving of data and the process by which these structures are created and manipulated. Topics include: abstract data types, lists, trees, hashing, stacks, queues, sorting, searching, and recursion.

Learning Objectives

Upon successful completion of the class, a student will be able to:
1. Understand and use searching and sorting algorithms.
2. Understand the concept of algorithm efficiency and be able to determine the Big-O efficiency of an algorithm.
3. Understand the concept of object-oriented programming through the use of abstract data types.
4. Understand and use dynamic memory allocation to create list, stack, and queue data structures.
5. Understand and use dynamic memory allocation to create tree data structures.
6. Be able to analyze and select appropriate data structures to implement a solution to a problem.
7. Understand and use recursion to solve a problem.
8. Understand the basic concepts of graph data structures and some of the algorithms associated with graphs.

Major Course Requirements

# Midterm Exams (2)  40% (20% each)
# Final Exam 25% (comprehensive)
# Programming Assignments 30%
# Class Attendance 5%

Required or Recommended Readings

Textbook: *Data Structures Using C++* by D. S. Malik, 2nd edition

Recommended or Supplemental Reading: *Starting Out with C++* by Gaddis, 7th edition
Course Policies

Attendance/tardiness
The students are expected to come to class on time every day the class meets. Read the chapter to be discussed before coming to class. Ask questions of material you do not understand. If I cannot explain the answers to your satisfaction, make an appointment with me to discuss the question. Demonstrate integrity, maturity, and ethical behavior.

Late work and Make-up Exams
Assignments are accepted until MIDNIGHT on the due date. Every homework assignment will list a due date for full credit. Late assignments will lose 10% of the maximum score per day. Makeup exams will not be given under normal circumstances. If you notify me immediately that serious, unavoidable, documentable (e.g., with a letter from your doctor) circumstances have arisen, I will discuss options for replacing the missing grade. (For example, I may allow the grade earned on the comprehensive final to replace the grade for the missed exam.) Excused absences due to school sponsored activities, religious observations, family rituals, etc. should be discussed in advance.

Academic Integrity/Plagiarism.
University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in the fail of the class.

Dropping a Class
I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. 11/02/2012 is the last day to drop a class with an automatic grade of “W” this term.

Classroom/professional behavior
Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

Grade Appeals
As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to
demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

Disabilities Accommodations

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 believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Driftwood 101.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

Syllabus

*(course outline)*

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Ch 2: OOD | Lab 1 |
| 2  | Ch 3: Pointers; Ch 5: Linked Lists  
Ch 5: Linked Lists | Lab 2 |
| 3  | Ch 5: Linked Lists  
Ch 6: Recursion | Lab 3 |
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Ch 7: Stacks | Lab 4 |
| 5  | Exam 1 (Ch 1,2,3,5,6)  
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| 6  | Ch 9: Searching and Hashing Algorithms  
Ch 9: Searching and Hashing Algorithms | Lab 6 |
| 7  | Ch 9: Searching and Hashing Algorithms  
Ch 9: Searching and Hashing Algorithms | Lab 7 |
| 8  | Ch 10: Sorting Algorithms  
Ch 10: Sorting Algorithms | Lab 8 |
| 9  | Exam 2 (Ch 7,8,9)  
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| 10 | Ch 11: Binary Trees and B-Trees  
Ch 11: Binary Trees and B-Trees | Lab 10 |
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**FINAL EXAM – May 15, 2013**