COSC2320: Data Structures

Instructor: Carlos Ordonez

1 Course information

Newsgroup: on Google newsgroup, instructions posted in TA web page (Wellington)
email: Start subject line with "COSC2320-" (personal issues, or if answer is not posted newsgroup).

2 Course contents

This is an introductory level course on data structures and algorithms. This course assumes basic computer science knowledge, programming experience with the C language and basic background on mathematics. The textbook is [2]. Any book on C++ (I recommend Stroustroup's textbook on C++) and discrete mathematics are helpful for additional reference. A recommended classical textbook for additional reference is [1].

Topics include the following. Basics of C++ and OOP: pointers, encapsulation, abstract data types, inheritance, methods, overloading. Fundamental data structures: lists, queues, stacks, trees, heaps, hash tables, graphs. Sorting and search algorithms: selection sort, heap sort, quick sort, shell sort, merge sort, linear and binary search, hash-based search. Theory: recursion, time complexity analysis, algorithm design techniques.

3 Grading

- 60%: 7 programming assigments (HW 0 Pass/fail, no grade).

- 20%: Midterm.

- 20%: Final exam.

Programming assisgnments are a fundamental component of learning for this course. All programming homeworks must be turned in to get B-. Programs will be developed in C++ with the Borland C++ compiler (any version up from 3.0 to 5.5, no other compiler is acceptable). Programming assignments are individual. The TAs will post sample test cases, but the programs will be tested with similar test cases (not the same input files). Programs are thoroughly tested by the TAs, are a graded on a 0-100 scale and there is a serious penalty for each encountered error. A non-submitted program grade is ZERO, a non-working program (i.e. compiles, but does not run) grade is 10, while a program with many errors typically reaches 50. Only fully functional programs can be expected to receive 80 or higher.

The midterm exam will take place around the 7th week of class. The final exam will cover all topics and will take place on the official day by the UH academic calendar.

References

[1] A. Aho, J.E. Hopcroft, and J.D. Ullman. *Data Structures and Algorithms*. Addison/Wesley, Redwood City,California, 2nd edition, 1983.

[2] D.S. Malik. *Data Structures Using C++*. Course Technology, 2nd edition, 2010.