CS 3112 Data Structures and Algorithms

Syllabus

Fall 2018

Lectures: M: 9:50-11:20 AM (Lecture), W: 9:50-11:30 AM (Lab) @SH 259

Instructor: Yuqing Zhu
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Office Hours: T: 9:30 - 11:30 AM, 1:30-2:30PM
Th: 1:30 - 2:30 PM.

Course Description: Abstract data types and their use in constructing algorithms for manipulating lists, trees, and graphs; analysis of algorithms for searching, sorting, and data structure manipulation.

Course Goals: At the end of the course, students are able to
1. Analyze the correctness and computational complexity of computer algorithms.
2. Design (specify and implement) efficient advanced Data Structures.
3. Know advanced design techniques and their nontrivial application to classic problems of searching, sorting, graph optimization and combinatorial optimization.

These course goals contribute to the success of Student Learning Outcomes 1.a, 1.d, 1.e, 5, and 6.

Prerequisites: CS 203, Math 208, Math 248 and Math 270

Textbook(s): Introduction to Algorithms (3rd Edition). By: Cormen, Leiserson, Rivest
Chapters 1 - 12 will be covered, Chapters 15-16, 22-25 may be covered.


**Topics:**
1 Mathematical Foundations: Summation Formulas, Logarithms, Induction, Lower and Upper bounds, Asymptotic Notation, Recurrence Relations, Master Theorem, Loop Invariants.
4 Graph Algorithms and Searching and Sorting Algorithms.
5 Design Techniques: Divide and Conquer, Greedy and Dynamic Programming.

**Grading Policy:** Two Midterm Exams (20% + 20%), Final Exam (30%), Homework Assignment (30%).

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

**Academic Integrity:** Students are allowed and encouraged to discuss reading materials with each other. However, homework assignments must be solved and written individually. If you obtain a solution with help then you should acknowledge your source in the paper and then write independently your own solution. *Cheating will not be tolerated. Cheating on any assignment or exam will be taken seriously. All parties involved will receive a grade of F for the course and be reported to the Academic Senate.*

**General Policies:**
1 **Makeup Exams:** No.
2 **Homework Assignments and Projects:** Non-programming homework assignments should be written or typed neatly on
standard sized paper (8.5 x 11 inch), possibly in black or blue ink (please do not use red) and submitted at the due date (no electronic submissions accepted unless stated otherwise in class). Each page should be numbered. Late submissions will not be accepted. **Programming homework assignments and projects** must be presented to the instructor.

**Final Exam:** December 10th, 2018. 9:30am-11:30am

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation.

**NO MAKE-UP EXAMS, NO LATE HOMEWORKS, AND NO INCOMPLETES!!!**