Course Syllabus

CS670 Advanced Analysis of Algorithms

Fall 2012

Instructor: Prof. Ming-Deh Huang, Sal 314, X04783, mdhuang[at]usc[dot]edu, Office Hours: W 2-3pm

TA: Anand Narayanan, Office Hours TBD, Sal 229

Time and Location: 2-3:20, MW, WPH 207

Course Information:

- **Text:** Introduction to algorithms, 3rd Ed., by T. Coremen, C. Leiserson, R. Rivest, and C. Stein, McGraw-Hill.
- **Prerequisite:** covered in Ch. 1,2,3,4,10,22 and Appendix (VIII) of the textbook.
- **For interested students who are not in the CS PhD program:** The PhD section covers the same topic in greater depth compared to the MS section. It also covers more topics and is more rigorous and sophisticated in terms of mathematical reasoning. In order for you to find out whether this is the right section for you, we suggest that you review Chapter 2 and 4 and work on the following four problems as a sample subset of a homework assignment: 2.3-7, 2-1, 4-6, 4-7.

Course Outline: The topics covered and the corresponding chapters and sections in the textbook are as follows:

- Introduction
  - Divide and conquer: 2.3.
  - Heapsort: 6.1 - 6.5.
- Design and analysis techniques
  - Dynamic programming: Ch. 15.
  - Greedy algorithms: 16.1, 16,2, 16.3.
  - Amortized analysis: 17.1 - 17.3.
- Advenced Data structures
  - Fibonacci Heaps: Ch. 20
- Graph algorithms:
  - Minimum spanning trees: 23.1 - 23.2.
  - Shortest Paths: 24.1 - 24.3, 25.1 - 25.3.

    - Maximum Flow: 26.1 - 26.2.
- Number Theoretic Algorithms: 31.1 - 31.7
- NP-Completeness: 34.1 - 34.5.
- Approximation Algorithms: 35.1 - 35.4.

Class Structure:

- **Homework:** There will be about 8 assignments. They will be posted under Assignments.
- **Exams:** There will be three or four in class quizzes on homework problems. Your homework grade will be based on the scores of these quizzes. There will be an in-class midterm exam and a final exam. The exams are closed book and closed notes.

	Date	Location
Quiz 1	Wed., Jan. 30	WPH 207
Quiz 2	Wed., Feb. 20	WPH 207
Midterm	Monday, Mar. 13	WPH207
Quiz 3	Monday, April 8	WPH207
Quiz 4	Monday, April 29	WPH207
Final Exam	Monday, May 13, 2-4pm	WPH207

- **Grading Policy:**

Homeworks	40%
Midterm	30%
Final Exam	30%

Statement for Students with Disabilities
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.-5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Statement on Academic Integrity
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to

understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.

Additional policies:

- Student Conduct Code of the University will be strictly enforced. Please review these policies.
- Please review University grading policies
- Please visit course homepage and check Announcement regularly.
