Syllabus: CS575 Design and Analysis of Algorithms

Spring 2016
Department of Computer Science
T.J. Watson School of Engineering
State University of New York at Binghamton

Instructor

- Name: Kyoung-Don (KD) Kang
- Office: EB Q10
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Teaching Assistants

- Mehrnoosh Shakarami (mshakar1@binghamton.edu) and Ankur Vora (avora4@binghamton.edu)
- TA Office Hours
    - Ankur: 12pm – 1 pm Tuesday & 2:30pm – 3:30pm Wednesday in EB G25
    - Mehrnoosh: 12pm – 1pm Thursday & 4pm – 5 pm Friday in EB G25

Class Time and Place

- Time: 12pm – 1pm MWF for Section 1 & 1:10pm – 2:10pm MWF for Section 2
- Classroom: UU102

Course Objective

This course is designed to build a solid foundation in design and analysis of algorithms. In particular, upon successful completion of this course, you will be able to understand and apply key methodologies for algorithm design and analysis including (but not limited to) the following ones:

- Time and space complexity analysis
- Divide and conquer
- Dynamic programming
- Greedy algorithms
- Backtracking
- Branch and bound
- Theory of NP
- Parallel algorithms (if time permits)

Furthermore, you will be able to develop software by applying these techniques.

Prerequisite

- CS375 (Undergraduate Algorithms) or equivalent
- C/C++ in Linux

Textbook

- Cormen, Leiserson, Rivest and Stein, "Introduction to Algorithm", 3rd or 4th edition McGraw-Hill, 2009. (recommended)

- R. Neapolitan and K. Naimipour, "Foundation of Algorithms Using C++ Pseudocode", 3rd (or later) edition, Jones and Bartlett, 2004. (recommended)

Other

- S. Dasgupta, C.H. Papadimitriou, and U.V. Vazirani, "Algorithms".

The instruction will be primarily based on the Instructor's Lecture Notes that can be downloaded from blackboard.

Lecture Notes

Lecture Notes for each chapter will be posted on blackboard before lectures. I recommend you to print lecture notes beforehand and bring them to class so that you can take notes easily. Note that lecture notes do not replace class attendance, since (i) they will not be complete and (ii) significant parts of lectures, including in-class discussions and exercises, may not come from the lecture notes.

Expected Weekly Effort

- Classroom Instruction: 3 hours
- Outside classroom effort (reading, homework, and projects): approximately 10 hours

Academic Honesty

The Binghamton University academic honest code, http://www.binghamton.edu/watson/about/honesty-policy.pdf, will be followed. For any violation of the honesty code, e.g., plagiarism or unauthorized collaboration, all involved students will be given zero for the assignment, test, project, etc. You will get zero if you copy someone else's work. Also, note that you will get zero if you make your work available to somebody else by any means (online or offline), even if you don't copy anything. On the second violation, the involved student(s) will be given an F and will be officially reported to the Watson School Committee for Academic Honesty.

Students Talk About Academic Honesty: Click here to watch the video.

Grading: Relative but Final (Non-negotiable)

- 4 Homework Assignments: 10% (2.5% each)
- 4 Projects: 10% (2.5% each; C/C++ in Linux)
- Exam 1: 25%
- Exam 2: 25%
- Final: 25%
- Attendance and Class Participation: 5%

If you score lower than 60 in any exam, you may fail in this course.

Course Policies

- Collaboration: Each student must complete assignments and projects *individually*. Students submitting solutions that are determined to be "too similar" are likely to be punished equally and harshly. We can tell whether you have done the work on your own. Hence, please do the work on your own.
- Software plagiarism regarding programming assignments will be checked via an advanced tool. If the programs of two or more students have an identical or highly similar part, all of them will be given zero for the project. Students will be required to

prove that they did an assignment on their own if there is any indication or hint of plagiarism.

- Some late assignments will be accepted with late penalty that is 10% per day (including weekends and holidays). No late assignment will be accepted 3 days after the due date.

- No makeup exam will be given except for real emergency.

- Neither the TA nor the instructor will debug or review your code.

- If regrading is requested, the entire assignment or exam will be regraded. As a result, your grade may decrease, increase, or stay the same. The new grade will be final and will not change.

- No regrading request will be accepted after two weeks since the grade is assigned. Your grades will be posted on myCourses. Please check your status on myCourses periodically and make sure that there is no missing grade or error. A missing grade at the end of the semester will indicate that the work has not been done.

Attendance Policy and Classroom Etiquettes

- Attendance is mandatory. The instructor will take attendance at the beginning of every class. A late arrival or an early leave with no prior approval by the instructor will be considered as missing half a class, and attendance credit will be deducted accordingly. If you miss more than 6 classes, you will get an automatic NSF (No Show F).

- You are not allowed to use your laptop, notebook, tablet, or smartphone in class. Smartphones must be turned off or in vibrate alert mode during class.