CS 401: Computer Algorithms I[1]

Fall 2019: T-Th 3:30 pm -4:45 pm, ARC 136

Instructor: **Abolfazl Asudeh**, Assistant Professor
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Hours: Th 5:00pm-7:00pm

GTA: Steve Huang
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Hours: Wed. 2:00-4:00pm

Prerequisites:

- 'C' or better in: CS 251 or MCS 360
- (Discrete math, Data structures, simple algorithms such as search, sort, tree and graph traversals, run time analysis)

Course Description and Goals:

- The design of computer algorithms is a rich and heavily studied area in computer science, whose impact has been great in both the practical and theoretical aspects of the field. At a high level, this course's aim is to introduce you to various standard methods for designing algorithms, including the greedy method, divide-and-conquer, and dynamic programming. We then venture on to the theory of NP-completeness, which is a theory developed by the computer science community in an attempt to prove that some computational problems simply do not have efficient algorithms, but rather only extremely inefficient ones.

Textbook:

- Kleinberg and Tardos, Algorithm Design , Addison Wesley, 2006, ISBN 0-321-29535-8. The publisher's website has student support site.

Additional References:

- Cormen, Leiserson, Rivest, Stein, *Introduction to Algorithms*, *2nd ed.*, MIT Press, 2001.
- Introduction to Algorithms, 1982, Sedgewick, Addison Wesley Publishing Company
- Introduction to the Theory of Computation, 1992, Michael Sipser, PWS Publishing Company
- The Art of Computer Programming, Vols. 1 and 3, Knuth, Addison Wesley Publishing Company

Evaluation: Your grade will be based on the following weights (tentatively):

- **Homeworks: 35%**
- **Midterm Exam: 30%**
- **Final Exam: 35%**

The final grade is computed as follows:
(average of the homeworks)*0.35 + midterm*0.3 + final*0.35 + raw extra credit

Grades will be posted online on the UIC Blackboad system.

[1] https://www.cs.uic.edu/bin/view/CS401/Syllabus

If you have a question or complaint about the way a homework or exam problem was graded, then, *within one week* of the date the assignment is returned, you should either explain what it is on a separate piece of paper and give it to the TA along with the assignment or, better yet, come into office hours and get it straightened out then. We want everyone happy and satisfied, but we can't do much in the couple of minutes before and after class.

If you do not work on all the problem sets, then do not expect to pass the course. (Not only are the problem sets weighted heavily, but students who don't do the problem sets flunk the midterm and the final.)

Homework:

There will be problem sets roughly every 2-3 weeks, due in class. *In general, no late assignments will be accepted.* Requests for an extension will almost always be denied, except for extenuating circumstances, which must be requested *at least a day before the due date of the assignment*.

Your homeworks must be submitted on Blackboard, each question as a separate submission. You can submit a PDF, MSWord or a JPEG file. You can generate it electronically (from LaTeX, for example) or scan or take a *legible* picture of your handwritten homework.

Extra Credit: Some homeworks will have extra credit questions. You can only get extra credit if you solve the homework questions first. To receive the extra credit you need to solve the extra credit question almost perfectly (it is an all or nothing system).

Each extra credit question's points will be added unmodified to the total final grade.

Please read the Guidelines for Written Homeworks before doing the first assignment.

Attendance: I do not plan to associate grades with whether or not you attend class, unless a serious problem with attendance develops.

Rule, Academic Integrity

Incompleteness:

The UIC Undergraduate Catalog states that in addition to needing excellent justification for an incomplete, a student must also have been "making satisfactory progress in the course."

Therefore, no matter how good your excuse, I will not grant you an incomplete if you have less than a C average at the time you ask for an incomplete.

Academic Integrity:

You may discuss the homework problems with other students; in fact, I encourage you to do so, but you are expected to write up your solutions by yourself. If you do work on the problem sets with other students, please put the names of your group at the top of your problem set. If you consult any web page while working on an assignment, put the URL for the page on the homework. If your homework is highly similar to another students' homework (e.g., more than 50% as determined by the similarity checking software) then we will consider you to be guilty of cheating.

Cheating will not be tolerated!

Not only is cheating a violation of the campus code of integrity, which might incur a reduced grade, expulsion from the class or university, it is also a slight against the other students in the class who will give you dirty looks. Refer to the UIC Student Disciplinary Policy for guidlines and policy on student integrity and possible repercussions. Cheating is plagiarism, taking credit for somebody else's work and I take it very seriously.
The minimum penalty for any cheating will be a grade of zero for the homework, project, or exam in question, along with a warning. The minimum penalty for cheating after a warning has been given will be an F for the course. In both cases, the maximum penalty is expulsion from the University.

Keeping Documents Private:

You must keep private and not email, post on the web, or share in any way:

- Any solutions to homework problem sets of tests that we give you,
- Any lecture notes not posted on the class website.

Other Resources:
Information about how to interpret midterm grades
Statement about disability services
List of registration and records policies
http://www.uic.edu/ucat/catalog/CA.shtml#f

Credits: this document has been adapted from Dr. Tanya Berger-Wolf and Dr. Sevag Gharibian, who taught this course in fall 2017 and fall 2012, respectively.