

Course Syllabus

Course Information

CS 4349-501: **Advanced Algorithms Design and Analysis**, Fall 2017

Mon & Wed 7:00pm–8:15pm, AD 2.232

Website: <https://utdallas.edu/~kyle.fox/courses/cs4349fa17/>

Professor Contact Information

Kyle Fox, Assistant Professor

(Temporary) Phone: (972) 883-2185

Office : ECSS 2.701

Office Hours : time and location TBA. Additional office hours by request.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

CS 3305 with a C or better and CE/CS/SE/TE 3345

Course Description

Asymptomatic analysis, recurrences, and graph algorithms. Algorithm design techniques such as greedy method, dynamic programming, and divide-and-conquer. Issues from computational complexity. Course emphasizes a theoretical approach.

Student Learning Objectives/Outcomes

- Ability to use asymptotic notations, solve recurrences, perform algorithm analysis
 - Ability to design, analyze, and prove correctness of algorithms based on Divide-and-Conquer techniques
 - Ability to design, analyze, and prove correctness of algorithms based on Greedy techniques
 - Ability to design, analyze, and prove correctness of algorithms based on Dynamic Programming techniques
 - Ability to design, analyze and prove correctness of graph algorithms
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Required Textbooks and Materials

Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein: **Introduction to Algorithms, 3rd Edition**. MIT Press 2009

Suggested Course Materials

Jeff Erickson: Algorithms, Etc. Available at <http://jeffe.cs.illinois.edu/teaching/algorithms/>.

Assignments & Academic Calendar

I will assign homework roughly every week to be due the following week. There will be one midterm exam covering roughly half the course material and a cumulative final exam.

Tentative Exam Schedule

Midterm Exam: Wednesday, October 4th from 7:00pm to 9:00pm in AD 2.232

Final Exam: Monday, December 11th from 8:00pm to 10:45pm in AD 2.232

Grading Policy

I will assign grades using a curve with minimum guarantees.

First, *raw totals* are computed using the following weights. Extra credit does not contribute toward raw grades. Each student's lowest homework assignment score is dropped, but each assignment is otherwise given equal weight.

Homework: 30%

Midterm Exam: 30%

Final Exam: 40%

Your *adjusted total* is your raw total plus any extra credit earned on homework assignments (see Course & Instructor Policies).

You will receive either a curved grade or absolute grade, *whichever is higher*.

The curved grade cutoffs are determined using the *raw totals*. Unfortunately, I will not know where these cutoffs lie until all grades are in. Your curved grade is determined by where your *adjusted total* lies between these cutoffs.

Minimum requirements for absolute grades are as follows:

A+: 90%

A: 85%

A-: 82.5%

B+: 80%

B: 75%

B-: 72.5%

C+: 70%

C: 65%

C-: 62.5%

D+: 60%

D: 55%

D-: 52.5%

Your absolute grade is determined by where your *adjusted total* lies between these cutoffs. Again, you get the *better* of your curved and absolute grades. This grading scheme is designed so everybody that does particularly well can get a high grade despite there being a curve.

I may increase grades beyond what is guaranteed above at my discretion.

Course & Instructor Policies

I cannot accept late homework, which is partly why the lowest homework score is dropped.

If you know about a conflict with the scheduled exam dates, please inform me at least one week in advance so we can set a conflict exam time. Makeup exams for unexpected conflicts will be scheduled if you have a documented medical excuse. If you have or feel you may have a disability that requires a reasonable accommodation in how I structure or administer an exam, please consult with and get written document from the Office of Student AccessAbility (OSA) at least one week in advance of the exam.

It is the Computer Science Department's policy that absence in three consecutive lectures will result in the course grade being lowered by one letter and absence in four consecutive lectures will automatically result in a failing grade (F) in the course.

I may include more difficult extra credit questions on some homework assignments to encourage a deeper understanding of the material. Together, these questions will be worth at most 1/6 of the overall homework score. The cutoff points for the curved grades *are not* affected by extra credit.

You are encouraged to discuss homework problems with other students. However, it is expected that you not work together while writing down your solutions and that solutions be written in your own words.

You are expected not to use outside sources while solving homework problems. However, if you do use outside sources (or write solutions in close collaboration with another student) then you may cite that source (or student) and still receive full credit for the solution. Material from the lecture, the required textbook, or prerequisite courses need not be cited. **Failure to cite other sources or failure to provide solutions in your own words, even if quoting a source, is considered an act of academic dishonesty.**

You may bring written or printed notes on a single 8.5'' X 11'' piece of paper during exams. No other outside sources or collaboration will be allowed. These notes must be turned in along with the exam.

Requests for regrades must be made within one week of the homework assignment or exam being returned. The problem in question will be completely regraded, so your score may actually go down. Please send regrade requests for exams to me and requests for homework assignments to the TA.

UT Dallas Syllabus Policies and Procedures

The University maintains a standard policies and procedures segment for course syllabi. Please refer to <http://go.utdallas.edu/syllabus-policies> for this segment.

These descriptions and timelines are subject to change at the discretion of the Professor.