Course Syllabus

Course Information

CS 4349-004: **Advanced Algorithms Design and Analysis**, Fall 2018
Mon & Wed 1:00pm–2:15pm, ECSS 2.306
Website: https://utdallas.edu/~kyle.fox/courses/cs4349.004.18f/

Professor Contact Information

Kyle Fox, Assistant Professor
Phone: (972) 883-4168
Office: ECSS 4.224
Office Hours: Tuesdays 2:00pm–3:00pm (tentative). 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

Required Textbooks and Materials

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

Highly Suggested Course Materials

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

Assignments & Academic Calendar

Homework will be assigned roughly every week to be due the following week. There will be at least ten homework assignments released. There will be one midterm exam and a cumulative final exam.

Tentative Exam Schedule
Midterm Exam: Wednesday, October 3rd from 1:00pm to 2:15pm in ECSS 2.306
Final Exam: Wednesday, December 12th from 2pm to 4:45pm

Grading Policy

Each student's lowest homework assignment score is dropped, but each assignment is otherwise given equal weight. Afterward, grades are determined by a weighted sum of the following three items.

Homework: 50% Midterm Exam: 20% Final Exam: 30%

Minimum requirements for 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%

The requirements may be *lowered* depending on how difficult assignments are and how the class as a whole performs. The lower cutoff for a D- will *not* go below 40%.

Individuals' grades may be increased beyond what is guaranteed by the final cutoffs at the instructor's discretion.

Course & Instructor Policies

Details on remaining course policies for assignments and writing of solutions can be found on the course website. A few key points can be found below.

Late homework will not be accepted, which is partly why one homework score is dropped.

You may write "I don't know" and **nothing else** as the answer to any question or lettered part of a question to get 25% credit for that part. Fully correct but suboptimal answers will always be worth more than 25%. Simple babble or repeating what was said in lecture or in the text will result in no credit.

Homework may be submitted in groups of up to three students. All three students should submit a single copy of the homework with all three names, the homework number, and problem number at the top of every page. Every problem should start on its own sheet of paper, and all sheets should be stapled together. You are highly encouraged to typeset your solutions to make them easier to read and grade.

You are expected to solve problems using only course material and work done within your group. If necessary though, you are permitted to use any outside source or person as long as you **cite the source** and **rewrite the solution in your own words**. Properly cited and rewritten outside material is still worth full credit. Material not cited or not rewritten in your words will be considered an act of academic dishonesty and suspected incidents will be reported to the Office of Community Standards and Conduct.

There may be a small amount of extra credit available. It will not affect the percentage cutoffs for students' grades.

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 the instructor and requests for homework assignments to the TA.

If you know about a conflict with the scheduled exam dates, please inform the instructor at least one week in advance to 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 the structure or administration of an exam, please consult with and get written documentation from the Office of Student AccessAbility (OSA) at least one week in advance of the exam.

You may bring notes written or printed on both sides of 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.

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.

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.