Course Information
CS 4349: Advanced Algorithm Design and Analysis, Spring 2020
M,W 10:00am – 11:15am, ECSS 2.305
Website: http://utdallas.edu/~bar150630/cs4349sp20.html

Professor Contact Information
Benjamin Raichel, Assistant Professor
Phone: (972) 883-4193
E-mail: benjamin.raichel@utdallas.edu
Office: ECSS 4.226
Office hours: TBD. 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

<table>
<thead>
<tr>
<th>Class learning objectives</th>
<th>CS outcome</th>
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<tbody>
<tr>
<td>Asymptotic notations, solve recurrences, algorithm analysis</td>
<td>a,e</td>
</tr>
<tr>
<td>Divide and Conquer algorithms</td>
<td>a,c,e</td>
</tr>
<tr>
<td>Greedy algorithm techniques</td>
<td>a,c,e,k</td>
</tr>
<tr>
<td>Dynamic Programming techniques</td>
<td>a,c,e,k</td>
</tr>
<tr>
<td>Graph algorithms</td>
<td>a,c,e</td>
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CS Outcomes
(a) an ability to apply knowledge of mathematics, science, and engineering;
(b) an ability to design and conduct experiments as well as analyze and interpret data;
(c) an ability to design a system, component, or process to meet desired needs;
(d) an ability to function on multidisciplinary teams;
(e) an ability to identify, formulate, and solve engineering problems;
(f) an understanding of professional and ethical responsibility;
(g) an ability to communicate effectively;
(h) the broad education necessary to understand the impact of engineering solutions in a global/societal context
(i) a recognition of the need for and ability to engage in lifelong learning;
(j) a knowledge of contemporary issues; and,
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Required Textbooks and Materials


Suggested Course Materials

Additional material will be provided in class or posted on the class web site.

Assignments & Academic Calendar

The main course topics will be covered in the following order:

1. Introduction, asymptotic notation, recurrences
2. Iterative, Divide-and-Conquer and Prune-and-Search algorithms
3. Dynamic Programming
4. Greedy algorithms
5. Graph algorithms, network flow

The course will consist of two halves, each culminating with an in class exam. As such, there is no cumulative final exam. Each half of the class will also have 2 or 3 homeworks each, and will cover roughly half of the above topics.

Midterm examination 1: TBD

Midterm examination 2: TBD

Grading Policy

Homework: 30%, Midterm 1: 35%, Midterm 2: 35%
For each student, their lowest homework score will be dropped.
Note that when determining your final letter grade the numerical value of your score in each category is less important than your score relative to the class average. That said, there is no fixed curve, i.e. if everyone performs well in the class then everyone can get good grades. I encourage students to talk with me about their grade before considering dropping the course.

Course & Instructor Policies

--No late homeworks will be accepted, unless the student provides a valid documented reason, i.e. medical or family emergencies. I intend to enforce this strict late homework policy, which is partly the reason for allowing the lowest homework score to be dropped.
--If a student is unable to take the examinations on the scheduled dates, he/she should inform the instructor well in advance. Makeup examinations will be scheduled only if the student has a valid medical excuse.
--Attendance may be taken in class (at the instructors discretion). Three consecutive absences with result in an automatic full letter grade drop.
--Any request for a regrade needs to be made within one week of the assignment or exam being returned. Note that a regrade request means “regrade”, i.e. your score could go down. Homework regrade requests should be made directly to the TA.
--Students are encouraged to discuss homework problems together, however, students are not to work together when writing down their solutions. Each homework submission must be in the student's own words.
--Students are expected to solve problems without the help of outside sources (i.e. “googling the solution”). If for any reason the student does use outside sources, they must cite them clearly, and their solution must still be put in their own words. Failure to cite sources is considered cheating and plagiarism.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.