

## Course Syllabus – Spring 2023

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### Course Information

Course	<b>CS 4349, Section 002</b>
Course Title	<b>Advanced Algorithm Design and Analysis</b>
Term	Spring 2023
Days & Times	Mondays & Wednesdays 8:30 am – 9:45 am

### Professor Contact Information

Professor	Anjum Chida
Office Phone	972-883-2185
Email Address	anjum.chida@utdallas.edu
Office Location	ECSS 4.230
Online Office Hours	In-person - 10:00 am to 12:00 noon (Tuesdays & Thursdays) (Or by appointment, meeting can be virtual as well via MS-Teams)

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

- CS 3305 with a grade of C or better, and CE 3345 or CS 3345 or SE 3345 or 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

After successful completion of this course, the students are expected to gain these objectives:

1. Ability to use asymptotic notations, solve recurrences, perform algorithm analysis
2. Ability to design, analyze, and prove correctness of algorithms based on Divide-and-Conquer techniques
3. Ability to design, analyze, and prove correctness of algorithms based on Greedy techniques
4. Ability to design, analyze, and prove correctness of algorithms based on Dynamic Programming techniques
5. Ability to design, analyze and prove correctness of graph algorithms

### Required Textbooks and Materials

- Cormen T.H., Leiserson C.E., Rivest R.L., and Stein C., "Introduction to Algorithms", 3rd ed., ISBN: 978-0262033848.

## Academic Calendar

Class	Date	Material Covered	Major Topic
1	Jan 18	Chapter 1&2	Introduction, Math Review
2, 3	Jan 23, 25	Chapter 3	Growth of Functions; Asymptotic Analysis
4, 5	Jan 30, Feb 1	Chapter 4	Divide and Conquer
6, 7	Feb 6, 8	Chapter 4	Divide and Conquer
8, 9	Feb 13, 15	Chapter 15	Dynamic Programming
10, 11	Feb 20, 22	Chapter 15	Dynamic Programming Review
<b>12</b>	<b>Feb 27</b>		<b>Exam I</b>
13	March 1	Chapter 15	Greedy Algorithms
14, 15	March 6, 8	Chapter 16	Graph Representation Graph Searching
<i>Spring Break March 13-16</i>			
16, 17	March 20, 22	Chapter 23	Minimum Spanning Tree
18, 19	March 27, 29	Chapter 24	Single Source Shortest Path Review
<b>20</b>	<b>April 3</b>		<b>Exam II</b>
21	April 5	Chapter 24	All pairs Shortest Path
22, 23	April 10, 12	Chapter 24	Maximum Flow /minimum cut Algorithms
24, 25	April 17, 19	Chapter 25	NP-Hardness and NP-Completeness
26, 27	April 24, 26	Chapter 26	NP-Hardness and NP-Completeness
28, 29	May 1		Review
<b>30</b>	<b>May 3</b>		<b>Exam III</b>

Assignments will be through eLearning. For academic calendar [Click Here](#)

*Please view the TimeLine Diagram in elearning for more information.*

**Grading Policy:**

The grade will be determined as described below. The lowest assignment score will be dropped. No other bonus work, make-up work, dropped scores, or other means of raising your grade should be expected. At the end of the semester, it is possible that grades may be curved, but a curve should not be expected.

***Grades are not based on needs or consequences but are based only on performance.***

Total score will be calculated as follows:

Assessment	Percentage towards your Total Score
Exam – I	20 %
Exam – II	25 %
Exam – III	25 %
Assignments	20 %
Quizzes & Class Participation	10 %

Assignment of letter grade is as follows:

Total	Letter Grade
98-100	A+
93-97	A
90-92	A-
88-89	B+
83-87	B
80-82	B-
78-79	C+
73-77	C
70-72	C-
60-69	D
0-59	F

## Tentative Test Dates:

Exam 1: February 27  
Exam 2: April 3  
Exam 3: May 3

*\*All examinations will be at the Testing Center (<https://ets.utdallas.edu/testing-center>). Seats will fill up quickly; students are encouraged to register for **ALL** three exams early in advance during the **first two weeks** of semester.*

*\*Failure to take the exam due to incorrect registration or absence will result in score of zero for that exam, NO EXCEPTIONS.*

## Course & Instructor Policies:

### Exams

All three exams will be at the Testing Center. All students are required to register and **reserve seats at the center at least 48 hours before the exam**. This 48-hour deadline is strictly followed by the testing center. If a student misses an exam due to not registering 48 hours prior to the exam, this will constitute a ZERO for the exam. No Exceptions will be made for missing the exam due to missed or incorrect registration.

All exams could be registered in the first few weeks of the semester, once registered a confirmation email will be sent to the student. It is the student responsibility to ensure proper registration and to follow all the guidelines and dress code restrictions given in the Testing center website.

Exams must be taken on time. Exceptions require advance approval by the instructor. It is up to the instructor to determine whether an exception will be made and will depend largely on proof of extraordinary circumstances. Otherwise, a missed exam will either incur a substantial penalty or be recorded as a zero.

### Make-Up Exams

Make-Up exams will be administered only under extreme extenuating circumstances like hospitalization or road accidents. Proof of such incident is required to request a Make-Up and will be approved after instructors' discretion.

### Assignments

All assignments will be available via elearning and must be submitted via elearning as well. No email submission allowed. Assignments must be turned in on time. All assignments will be due on eLearning. Late submissions will be accepted, but any late submission made within 24 hours of when the assignment is due will have its score deducted by 10% the maximum score possible. Late submissions made more than 24 but less than 48 hours after the assignment is due will have the score deducted an additional 10% (so 20% total). No points will be awarded for submissions more than 48 hours late. Even after deductions, scores cannot be negative. It is your responsibility to upload your work early enough to avoid possible problems uploading to eLearning. It is your

responsibility to ensure that you have submitted the correct items. It is recommended that you double-check your submission to ensure it is correct.

All Assignments are to be individual efforts. You are allowed to collaborate with other students, or to discuss solutions with other students, but make sure that the work you submit is your own and not simply copied from other students work. Copying of Assignments in whole or in part, from other students in this semester or previous semesters will be considered an act of scholastic dishonesty. There will be no makeup exams or other extra credit opportunity in the semester.

No makeup work is possible for Assignments, but the lowest Assignment score will be dropped before calculating Assignment Total.

### *Participation Quizzes*

Participation Quizzes will be available via elearning multiple times throughout the semester. These quizzes will not be graded but participation credit will be given if the quizzes are attempted. Student will be able to attempt the quiz multiple times even though single attempt per quiz is sufficient to score the participation credit for that quiz. These attempts will be considered to calculate the Class Participation credit

### *Class Attendance*

Regular and punctual class attendance is expected. Attendance will be taken in every class, and this will constitute a part of Class Participation credit. **Attendance will be taken as an elearning Quiz, students need to login into elearning and take the Attendance Quiz in every class.** Students who fail to attend class regularly are inviting scholastic difficulty. Attendance score will be used to calculate Class Participation credit. Every student is allowed up to 3 absence per semester with no excuse, more if proper documentation is given for a valid excuse.

### *Class Participation*

Regular class participation is expected. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

### *Additional Videos*

In addition to regular class and lecture, the student will be required to watch additional videos covering some class material or providing help with Assignments. These additional videos will be released every week. There will be at least one hour and at most 2 hours of video released every week. Students will be expected to watch these videos in timely manner and contribute to class discussions pertaining to these videos.

### *Email Correspondence with the Instructor.*

Any courses related questions can be asked via email to the instructor. It is the instructor's policy to respond to every email within 24 hours, if a response is not given in 24 hours, the student is encouraged to email again. On occasions, the instructor gets too many emails and might forget to respond or read the email, student patience is highly appreciated in this matter.

### *Class Assessment Surveys*

There are three class assessment survey, one at the Beginning of the Semester, one at the Middle and one at the end of the semester. The end of semester survey is the official UTD course evaluation survey taken from the website [eval.utdallas.edu](http://eval.utdallas.edu) . The other two surveys will be via elearning. All surveys are anonymous. Surveys are considered as feedbacks from students which becomes essential part of course design and course conduct modifications. Surveys also encourages the instructor and helps the instructor become better at teaching the course.

### *Class Materials*

The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course; however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

### *Class Recordings*

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

The instructor may record meetings of this course. These recordings will be made available to all students registered for this class, the intent is to supplement the classroom experience.

### *OSA Students*

If you are seeking classroom accommodations under the Americans with Disabilities Act (2008), you are required to register with the Office of Student AccessAbility, located in the Administration Building. Their phone number is 972-883-2098, email: [studentaccess@utdallas.edu](mailto:studentaccess@utdallas.edu) and website

is <https://studentaccess.utdallas.edu> . OSA students need to submit a letter from OSA to the instructor as soon as possible preferable within first two weeks of the semester. The student must meet the instructor during the first two weeks of the semester to ensure all facilities and accommodations are properly met for their needs.

### *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.”**

### *Academic Support Resources*

The information contained in the following link lists the University’s academic support resources for all students.

Please see <http://go.utdallas.edu/academic-support-resources>.

The University of Texas at Dallas is committed to providing reasonable accommodations for all persons with disabilities. The syllabus is available in alternate formats upon request. If you are seeking classroom accommodations under the Americans with Disabilities Act (2008), you are required to register with the Office of Student AccessAbility, located in the Administration Building, Suite 2.224. Their phone number is 972-883-2098, email: [studentaccess@utdallas.edu](mailto:studentaccess@utdallas.edu) and website is <https://studentaccess.utdallas.edu> . To receive academic accommodations for this class, please obtain the proper Office of Student AccessAbility letter of accommodation and meet with me at the beginning of the semester."

### *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 review the catalog sections regarding the [credit/no credit](#) or [pass/fail](#) grading option and withdrawal from class.

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.*

# Timeline for CS 4349: Advanced Algorithm Design and Analysis

