Design and Analysis of Algorithms
Syllabus and Course Expectations

CS 3364.00; Spring 2025
Begins 1/15/2025; Ends 5/6/2025
Classroom Location: Human Science 00226
Meeting Times: MWF 2pm to 2:50 pm

Instructor: Dr. Uma Chinta
Office: EC 211A
Office Hours: TBD
Email: uchinta@ttu.edu
Mediasite: https://engrmediacast.ttu.edu/Mediasite/Channel/93mgg73-cs5381-d01-chinta-spring-2024

Contacting the Instructor

I encourage you to come see me in my office during office hours. These hours are reserved for you and your concerns, so please make use of this time. Please reach me using the email above and allow at least 24 hours for a response. I will respond to any emails that I receive after 5 PM, or on weekends, the following University business day.

If you are inquiring about something specific to your course or to you personally, please be sure to include your full name, course number, section number, and Rnumber in the email. I have a lot of students, and this will help me to address your concerns quickly.

Textbook and Course Materials

The required text for this course is *Introduction to Algorithms*, Third Edition by Cormen, T. et. al. ISBN: 9780262033848

Online exams and quizzes within this course may require online proctoring. Therefore, students will be required to have a webcam (USB or internal) with a functional microphone when taking an exam or quiz. Students understand that this remote recording device is purchased and controlled by the student and that recordings from any private residence must be done with the permission of any persons residing in the residence. To avoid any concerns in this regard, students should select private spaces for testing. The University Library and other academic sites at the University offer secure, private settings for recordings and students with any concerns may discuss location of an appropriate space for the recordings with their instructor or advisor. Students must ensure that any records do not invade any third party privacy rights and accept all responsibility and liability for violations of any third-party privacy concerns. Setup information will be provided prior to taking the proctored exam.
Blackboard: www.depts.ttu.edu/lms

Course Summary & Learning Outcomes

Course Objective
The goal of this course is to prepare students to become familiar with paradigms and approaches to analyze and design algorithms. Students who have completed this course should be able to analyze and design algorithms with various techniques.

Learning Outcomes
Understand theoretical analysis of algorithms for sorting, searching, sets, matrices, among other items.
Design efficient algorithms for data structures, recursion, divide-and-conquer, dynamic programming
Learn to graph algorithms and NP-completeness.

Key Topics
Sorting algorithms, greedy algorithms, graph algorithms, dynamic programming, knapsack problems, NP-completeness and undecidable problems.

Assignments & Grading Policy

Course evaluation is based on quizzes, exams, and homework (written assignments or projects). Your final grade in the course will be determined based on your performance as follows:

Assignment	Percentage
Homework	20%
Midterm Exam	20%
Quiz	10%
Final Exam	30%
Final Project	20%

Due Dates & Late Penalties
All major projects must be submitted through Blackboard by the due date and time listed on the course schedule. If you have trouble submitting your work on Blackboard for any reason, you must email me and include a copy of your completed assignment, along with an explanation of the technical problem, prior to the deadline for the assignment. As soon as the technical problem has been resolved, you must submit your assignment as usual. Any exceptions to this policy must be arranged with me prior to the assigned due date and time.

Assignments submitted less than one day after the due date (5 minutes is grace for network issues), there will be a 20% penalty. If your assignment is one day late (24 hours), you will receive a 50% penalty. Two dates late will result in a 75% penalty. Work will not be accepted 3 or more days late. Assignments cannot be accepted after the course has ended.

Always back up your electronic files. The best practice is to store digital files in at least two (2) locations. Develop a strategy for consistently and frequently backing up your digital files, whether that is through a cloud service such as Dropbox or Microsoft OneDrive, a flash drive, or another mechanism. A lost file or crashed computer is not an excuse for late work in this class.

Grading Structure
- A: Top 40% of students
- B: Greater than 70%
- C: Less than or equal to 69%

Academic Dishonesty
In this course, there is a **zero-tolerance policy for academic dishonesty**. I reserve the right to report any appearances of impropriety and/or academic misconduct to the Office of Student Conduct **at my discretion**. Please see Academic Integrity Statement for additional information.

Under no circumstances are students permitted to:
- Copy from another student's work, test, quiz, or other assignment.
- Receive assistance from and/or seek aid from another student or individual to compete academic work, test, quiz, or other assignment without authorization from the professor.
- Use or possess materials or devices during academic work, test, quiz, or other assignment which are not authorized by the person administering the academic work, test, quiz, or other assignment.
- Possess, use, buy, steal, transport, sell, or solicit in whole or in part items, including but not limited to, the contents of an unadministered test, test key, homework solution, or computer program/software. Possession, at any time, of current or previous course materials without the instructor's permission is strictly prohibited.
- Transmit or receive information about the contents of academic work, test, quiz or other assignment with another individual who has completed or will complete the academic work, test, quiz, or other assignment without authority.

- Substitute for another person or permit another person to substitute for oneself to take a course, test, quiz or complete any other assignment, or sign-in or register for attendance purposes.
- Take, keep, misplace, damage, or alter the property of the University or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct.
- Upload, download, or access complete or incomplete academic work, test, quiz, or other assignment without the prior approval of the instructor.
- Fail to comply with instructions given by the person administering the academic work, test, quiz, or other assignment.
- Plagiarize or self-plagiarize.
- Partake in unauthorized collaboration (collusion) or attempt to partake in unauthorized collaboration (collusion) to complete any academic work, test, quiz, or other assignment that results in similarities in the work, including but not limited to providing unauthorized assistance to another student and/or allowing another student access to completed academic work.
- Provide false or misleading information or official documentation in an effort to receive a postponement or extension on academic work, test, quiz, or any other assignment or credit for attendance.

The above list of infractions is not exhaustive. As previously stated, I reserve the right to report appearances of impropriety to the Office of Student Conduct at my discretion. Penalties for a responsible finding will be at my discretion, and will take into account the degree of seriousness for the alleged misconduct.

It is the student's responsibility to remain apprised of what behavior constitutes academic misconduct, and to not engage in such behavior. Not knowing what behavior constitutes academic misconduct is not an excusal for committing such behavior in my class.

Attendance & Absences

Attendance is mandatory for all exams but not mandatory for lectures. If you are absent, it is your responsibility to find out what you need to learn and do. No makeup exams or quizzes for unexcused absences. You can follow the MediaSite channel for all the lectures.

Illness-related absences will require proper documentation to be considered excused. Students should communicate with the instructor regarding adjusting course deadlines due to illness.

Absence due to officially approved trips Students missing class due to an approved trip should notify the instructor of the departure and return schedule **in advance** of the trip.
Please see **Religious Holy Day** section for additional information on absences of this nature.

Additional Expectations

All students must review the syllabus and the requirements including the online terms and video testing requirements to determine if they wish to remain in the course.

Enrollment in the course is an agreement to abide by and accept all terms. Any student may elect to drop or withdraw from this course before the end of the drop/add period.

Dropping a Course
Students may officially drop a course through the 45th class day of a long semester or the 15th class day of a summer term and receive a drop grade indicator regardless of their progress in the class. All students who attend a Texas state institution of higher education are restricted to a maximum of six course drops during their undergraduate academic career. This includes all courses dropped at any Texas state institution of higher education the student attended.

Students who request a grade
Maintaining your scholarship requires continued academic excellence, and while grade adjustments are not possible because you are losing scholarship, consistent effort and improvement are key to achieving your goals.

CHANGES TO THE SYLLABUS AND COURSE SCHEDULE - I reserve the right to change the components on this syllabus as needed.

Late Arrival, Late Return, and Early Departure Policy

The Computer Science department strictly follows the official academic calendars and requires students who are enrolled in face-to-face sections must be on campus by the first-class day of each semester and leave campus no earlier than the last day with scheduled course activities. The only exception we make is for incoming new international students who often need more time to obtain the necessary paperwork including study visa, and in such case, we accommodate late arrival for up to the 12th class day of their first semester. No exceptions will be made for late return or early departure requests from current students in general. If it is because of an unforeseen and uncontrollable situation, a student needs early departure or late return, then the student must obtain an in-advance approval from the academic advisors and instructors of all enrolled courses for an excused absence of four (4) or less weekdays and an additional in-advance approved Extended Absence Verification* from the Office of the Dean of Students for an extended absence of five (5) or more weekdays. If a student has unexcused absences, then the student must take the full responsibilities of any missed classes, or missed academic work, or any financial issues caused. * Extended Absence Verification Request to be verified by Office of the Dean of Students: https://cm.maxient.com/reportingform.php?TexasTechUniv&layout_id=6

University Required Syllabus Statements

Texas Tech University requires that instructors make students aware of university policies concerning Special Accommodations for Students with Disabilities, Student Absences for Observance of Religious Holy Days and Accommodations for Pregnant Students.

ADA Statement
Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note: instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services in Weeks Hall or call 806-742-2405.

Academic Integrity Statement
Academic integrity is taking responsibility for one's own class and/or course work, being individually accountable, and demonstrating intellectual honesty and ethical behavior. Academic integrity is a personal choice to abide by the standards of intellectual honesty and responsibility. Because education is a shared effort to achieve learning through the exchange of ideas, students, faculty, and staff have the collective responsibility to build mutual trust and respect. Ethical behavior and independent thought are essential for the highest level of academic achievement, which then must be measured. Academic achievement includes scholarship, teaching, and learning, all of which are shared endeavors. Grades are a device used to quantify the successful accumulation of knowledge through learning. Adhering to the standards of academic integrity ensures grades are earned honestly. Academic integrity is the foundation upon which students, faculty, and staff build their educational and professional careers. [Texas Tech University (“University”) Quality Enhancement Plan, Academic Integrity Task Force, 2010].

Religious Holy Day Statement
"Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who is excused under section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

Statement of Accommodation for Pregnant & Parenting Students
Any pregnant student will be provided with supportive measures as would be provided to a student with a temporary medical condition including:

- ability to maintain a safe distance from hazardous substances, areas, or activities;

- excused absences;
- ability to make up missed assignments or assessments;
- additional time for assignment completion; and access to instructional materials and recordings of classes for which the student has an excused absence.

Any student who is pregnant or parenting a child up to age 18 may contact Texas Tech's designated Pregnancy and Parenting Liaison to discuss support available through the University. The Liaison can be reached by emailing titleix@ttu.edu or calling 742-7233. Please go to this link for more details and important information.

AI Tools in Class

The use of generative AI tools (such as ChatGPT) is ***not permitted*** in this course. Submission of such AI-generated content as your own work is a violation of academic integrity and may result in referral to the Office of Student Conduct. Please contact your instructor if you have questions regarding this course policy.

Additional Statements

Discrimination, Harassment & Sexual Violence

Texas Tech University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from gender and/or sex discrimination of any kind. Sexual assault, discrimination, harassment, and other Title IX violations are not tolerated by the University. Report any incidents to the Office for Student Rights & Resolution, (806)-742-SAFE (7233) or file a report online at titleix.ttu.edu/students. Faculty and staff members at TTU are committed to connecting you to resources on campus. Some of these available resources are: TTU Student Counseling Center, 806- 742-3674, https://www.depts.ttu.edu/scc/ (Provides confidential support on campus.) TTU 24-hour Crisis Helpline, 806-742-5555, (Assists students who are experiencing a mental health or interpersonal violence crisis. If you call the helpline, you will speak with a mental health counselor.) Voice of Hope Lubbock Rape Crisis Center, 806-763-7273, voiceofhopelubbock.org (24-hour hotline that provides support for survivors of sexual violence.) The Risk, Intervention, Safety and Education (RISE) Office, 806-742-2110, https://www.depts.ttu.edu/rise/ (Provides a range of resources and support options focused on prevention education and student wellness.) Texas Tech Police Department, 806-742-3931, http://www.depts.ttu.edu/ttpd/ (To report criminal activity that occurs on or near Texas Tech campus.)

Civility in the Classroom

Texas Tech University is a community of faculty, students, and staff that enjoys an expectation of cooperation, professionalism, and civility during the conduct of all forms of university business, including the conduct of student–student and student–faculty interactions in and out of the classroom. Further, the classroom is a setting in which an exchange of ideas and creative thinking should be encouraged and where intellectual growth and development are fostered. Students who disrupt this classroom mission by rude, sarcastic, threatening, abusive or obscene language and/or behavior will be subject to appropriate sanctions according to university policy. Likewise, faculty members are expected to maintain the highest standards of professionalism in all interactions with all constituents of the university (www.depts.ttu.edu/ethics/matadorchallenge/ethicalprinciples.php).

Student Support

The Office of Campus Access and Engagement works across Texas Tech University to foster, affirm, engage, and strengthen all student communities. For more information about services, opportunities for participation, and ways in which Texas Tech can support your success in college, please contact (806) 742-7025.

Food Insecurity

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. Furthermore, please notify the professor if you are comfortable in doing so. The TTU Food Pantry is in Doak Hall room 117. Please visit the website for hours of operation at https://www.depts.ttu.edu/dos/foodpantry.php.

Safety and Wellness

The Texas Tech University (TTU) and Edward E. Whitacre Jr. College of Engineering are committed to the safety and wellness of our students by providing various services and resources.

Make sure you register with Tech Alert to get emergency notification by phone call, text, or email. You are encouraged to review the Emergency Action Plans (EAPs) and watch the videos of Know What To Do In Emergency Events and

Surviving an Active Shooter Event Training to be prepared for those emergency situations. Additionally, due to the nature of laboratory or design courses, it is mandatory for you to follow the university safety policies and any additional safety protocols required by the course instructor(s).

For your wellbeing, various services are available at Student Counseling Center and Student Health Services. The Student Wellness Center provides convenient walk-in services M-F from 8 AM to 5 PM. Furthermore, the Texas Tech Crisis HelpLine (806-742-5555) provides 24/7/365 assistance for students experiencing a crisis or distress.

Emergency/Crisis Phone Number

TTU Police (UPD) Emergency	911
TTU Police (UPD) Non-Emergency	806.742.3931
TTU Emergency Maintenance	806.742.4OPS (4677)
TTU EHS (M-F, 8 am – 5 pm)	806.742.3876
SafeRide	806.742.RIDE (7433)
TTU Crisis HelpLine	806.742.5555
Student Wellness Center (From Urgent Care to a Full-Service Pharmacy on site)	806.742.2848
Title IX Reporting	806.742.7233
The Dean of Students	806.742.2984

Course Schedule (Tentative)

Week	Activity	Topic
Week 1 (01/17) No class on 15th	Lecture	Syllabus overview Introduction
Jan 20	**No Class**	**MLK DAY**
Week 2 (01/23)	Lecture	Algorithm Analysis and Notations
Week 3 (01/27)	Lecture	Recurrence
Week 4 (02/3)		
Week 5 (02/10)	Lecture	Divide and Conquer
Week 6 (02/17)	Lecture	Sorting
Week 7 (2/24)	Lecture	Data Structures
Week 8 (3/3)	Lecture	Advanced Data Structures
Week 9 (3/10)	**EXAM REVIEW/EXAM**	**Midterm Review** **Midterm 1 (Room & time TBD) March 14th**
Week 10: (3/15-3/23)	**No Class**	**SPRING BREAK**
Week 11 (3/24)	Lecture	Introduction to Dynamic Programming
Week 12 (3/31)	Lecture	Dynamic Programming
Week 13 (4/7)	Lecture	Greedy Algorithms
Week 14 (4/14)	Lecture	Graph Algorithms
April 21	**No class**	
Week 15 (4/23)	Lecture	Graph Algorithms
Week 16 (4/28)	Lecture	NP Problems
Final Exam	**Cant be altered**	**May 10th 7:30 to 10am (Refer to Final Exam Schedule)**

Due to a prior scheduled conference, classes on February 26th and February 28th will be recorded online