

**Computer Science 5381  
Analysis of Algorithms  
Course Syllabus and Policy Statement**

**Instructor:** Lu Wei

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**Office Phone:** (806) 834-1798

**Office Hours:** 4 - 5 PM Mondays and Fridays

**TA:** TBD

**TA Office:**

**TA E-mail:**

**TA office hours:**

**Lectures:** 1:00 – 1:50 PM MWF at Biology Room LH100

Lectures will also be live broadcasted via the Zoom link below during lecture hours.

<https://texastech.zoom.us/j/97443722637?pwd=YzIOa2RDaUp1ZjBXaTZzYkIXTDhrdz09>

Meeting ID: 974 4372 2637

Passcode: 5381

Lectures will also be recorded in Zoom and the recordings can be accessed via the links provided in Blackboards (after a few hours of each lecture):

**Catalogue Listing:** Theoretical analysis of algorithms for sorting, searching, sets, matrices, designing efficient algorithms for data structures, recursion, divide-and-conquer, dynamic programming, and graph algorithms.

**Textbook:** (optional) Introduction to Algorithms, Third Edition by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein

The lectures will be based on my lecture notes available on Blackboard.

**Course objectives:**

The objective of this course is to study paradigms and approaches to analyze and design algorithms.

**Key Topics:**

Growth of Functions. Divide-and-Conquer. Randomized Algorithms. Dynamic Programming. Greedy Algorithms. Graph Algorithms. Minimum Spanning Trees.

**Learning Outcomes:** Students who have completed this course should be able to analyze and design algorithms with various techniques.

**Homework Policy:**

There are three sets of homework that consists of 60% of the total grades. Due dates of each homework set will be announced in Blackboard. No due dates extension may be granted, and late submissions may not be considered.

**Grade Policy:**

Students need to participate all three exams (Tests 1&2 and final exam). All tests will count towards the final grade, that is, no exams may be dropped/missed.

Cheating on tests and assignments will not be tolerated. Any student caught cheating on an exam or assignment will receive a grade of 'F' for the course and will be reported to the Judicial Programs office.

**Course Grading distribution:**

Test 1 (tentatively on Wednesday, September 28): **10%**

Test 2 (tentatively on Monday, November 7): **10%**

Homework sets: **60%**

Final exam (1:30 – 4 PM on Monday, December 12): **20%**

**Course Grading:**

A 90-100%

B 80-89%

C 70-79%

D 60-69%

F 0-59%

There will be no extra-credit or grades curving.

**Lecture Schedule:**

- Holidays
  - Sept. 5              Labor Day
  - Nov. 23–25        Thanksgiving

In a subsequent order, we will discuss

- Growth of Functions
  - Asymptotic notations
  - Common functions
- Divide-and-Conquer
  - Preliminaries
  - Solving recurrences: substitution method, recursion-tree method, master method
- Probabilistic Analysis
  - Hiring problem
  - Indicator random variables
- Dynamic Programming
  - Rod cutting problem
  - Matrix-chain multiplication
  - Theory of dynamic programming
- Greedy Algorithms
  - Activity-selection problem
  - Elements of greedy strategy
- Graph Algorithms
  - Representations of graphs
  - Breadth-first search
  - Depth-first search
  - Minimum spanning tree

## **INSTITUTIONALLY REQUIRED INFORMATION TO INCLUDE IN ALL SYLLABI:**

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### **Important note:**

If Texas Tech University campus operations are required to change because of health concerns related to the COVID-19 pandemic, it is possible that this course will move to a fully online delivery format. Should that be necessary, students will need to have access to a webcam and microphone for remote delivery of the class.

Online exams within this course may require online proctoring. Therefore, students will be required to have a webcam (USB or internal) with a microphone when taking an exam. 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 person residing in the residence. To avoid any concerns in this regard, students should select private spaces for the testing. The University library and other academic sites at the University offer secure private settings for recordings and students with concerns may discuss location of an appropriate space for the recordings with their instructor or advisor. Students must ensure that any recordings 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. For additional information about online proctoring, you can visit the online proctoring student FAQ (<https://www.depts.ttu.edu/elearning/blackboard/proctorio/proctorio-student-faq.php>).

### **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 West 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.

## OPTIONAL INFORMATION TO INCLUDE IN ALL SYLLABI

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### **DISCRIMINATION, HARASSMENT, AND SEXUAL VIOLENCE STATEMENT:**

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](https://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](https://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 STATEMENT:**

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](https://www.depts.ttu.edu/ethics/matadorchallenge/ethicalprinciples.php)).

### **LGBTQIA SUPPORT STATEMENT\*:**

I identify as an ally to the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) community, and I am available to listen and support you in an affirming manner. I can assist in connecting you with resources on campus to address problems you may face pertaining to sexual orientation and/or gender identity that could interfere with your success at Texas Tech. Please note that additional resources are available through the Office of LGBTQIA within the Center for Campus Life, Student Union Building Room 201, [www.lgbtqia.ttu.edu](https://www.lgbtqia.ttu.edu), 806.742.5433.”

\*If you prefer to list campus resources rather than a statement about ally status, you might include the following among other campus resources you wish to share:

Office of LGBTQIA, Student Union Building Room 201, [www.lgbtqia.ttu.edu](https://www.lgbtqia.ttu.edu), 806.742.5433

Within the Center for Campus Life, the Office serves the Texas Tech community through facilitation and leadership of programming and advocacy efforts. This work is aimed at strengthening the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) community and sustaining an inclusive campus that welcomes people of all sexual orientations, gender identities, and gender expressions.