

# SYLLABUS

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## *CS5350/6350: Advanced Algorithms Fall 2020*

*CS5350 CRN: 16966; CS6350 CRN: 14633*

### **COURSE DESCRIPTION:**

This course provides a review of mathematical techniques for analysis of computer algorithms, techniques for design of efficient algorithms, description and analysis of both well-established and recently developed algorithms.

### **Learning objectives.**

The objective of this course is for students to become aware of the appropriateness of algorithms as solutions to given problems, of their efficiency, and to be able to discuss and justify solving techniques. Students will be able to implement algorithms adapted to the problems at hand. They will know how to communicate to team members the features of a given problem along with the solution they propose with its justification.

### **COURSE LOGISTICS:**

This course is fully online and live. We will be using Microsoft Teams for the live sessions of our lecture sessions, as well as for my office hours; our team is called **CS5350/6350**. You will be using Blackboard to take your exams. We will meet at the scheduled hours of our lectures (MW at 1:30pm). All students are expected to attend and actively participate in this course.

### **INSTRUCTOR**

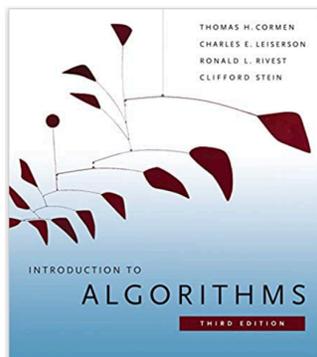
**Dr. Martine Ceberio**

[mceberio@utep.edu](mailto:mceberio@utep.edu)

Office hours:

- CS5350/6350 Team: TR from 11AM to noon  
+ contact me at any time on the individual chat of MS Teams
- Any urgency? Feel free to text me at 915-308-1164 (do not call).

### **REQUIRED TEXTBOOK:**



Introduction to Algorithms, 3rd Edition (MIT Press)

By Thomas Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein

### **COURSE ASSIGNMENTS AND GRADING:**

There will be 4 types of assignments / assessments for those of you who are taking CS2401:

1. Assignments
2. Quizzes
3. Exams
4. Presentations

Please see below the Course Calendar section for a list of all assignments: details for these assignments will be given on our course team (CS5350/6350) on MS Teams. All assignments described in this section are mandatory assignments and will count towards your course grade.

### **1. Assignments**

There will be reading assignments. There will also be purely homework assignments, exercises / activities to be completed entirely outside of class, but there will also be assignments started in class, to be completed at home. Reading assignments are announced and available below in this document. Homework assignments and other assignments will be announced as we go during the semester.

Completing the assigned activities on time will be crucial to your success in the class, since these activities prepare you for classwork, quizzes, and exams, and the total weight of these grades is 20% of your semester grade. If you struggle in any way while working on assignments, it is crucial that you seek help as soon as possible.

### **2. Quizzes**

The purpose of each quiz is to ensure that students are staying current with the weekly reading assignments and the class activities, and to verify that they have acquired the skills presented and practiced in class. Quizzes are unannounced. There will be no make-up on missed quizzes.

### **3. Exams**

There will be **2 midterm exams** and **1 final exam**. Exams will be assigned to be completed outside of class (by a specified deadline) on Blackboard. Their tentative schedule is available below. Make-up exams will be given only in extremely unusual circumstances. If you must miss an exam, please meet with an instructor, BEFORE the exam. The final exam will be comprehensive. You must score 70% or better on the final exam to pass this course. Because the exams contribute heavily to your total grade, it is vital that you put your best effort on each of them. If you have test-taking difficulties in general, or if you have difficulties with our tests in particular, please request appropriate accommodation from UTEP's Center for Accommodation and Students' Services (see below for more details).

### **4. Presentations**

You will be expected to put together **2 presentations** during the semester. You will video record yourselves and submit the video to your instructor. Specific instructions (topic, length, style) will be shared in a timely manner.

### **5. Active participation**

Attendance and participation in all lecture sessions are critical factors of your success in this course.

Students should be on time for all scheduled sessions and attend the entire session. Attendance will be taken at every session (you will be requested to post a message so I know you attended) and, along with evidence of your active participation, will count towards your class participation grade.

If you cannot attend a lecture, you have to inform your instructor. If the absence is due to a technical issue, at the time you are experiencing it, a text message to the above listed phone number will do. If it is a medical absence, you are expected to inform your instructor as soon as practical. In any case, you will have to complete a separate assignment to make up for each absence (or you will be counted absent).

If you are absent more than 6 times and do not communicate with us promptly and/or do not reply to our emails as we are trying to touch base with you, you will be dropped from the class within a week. In any

case, points from attendance will be taken off for each absence (5 points per unexcused absence, with up to 3 excused absences allowed per lecture).

During lectures, students should be on task. When in lecture, students are expected to direct their attention to the task / activity as directed by the instructor. For instance, lecture sessions are certainly not places for social-networking, working on homework, checking other courses / goldmine / etc.

Professionalism: Students should submit their work on time and meet all deadlines. Failing to do so will affect the active participation grade.

Communication: Students are expected to consult their emails and MS Teams messages every business day, ideally twice on these days at least, and to promptly answer these. Use of proper Netiquette (see below) is expected.

### ***Due Date of Assignments***

We will use deadlines following only the below pattern:

- Monday afternoon at 1:30PM (before your Monday lecture)
- Wednesday afternoon at 1:30PM (before your Wednesday lecture)
- Saturday night at 11:59PM.

If you foresee that any of these deadlines will be an issue, you are already given most of the deadlines for the semester and therefore can arrange to work ahead of time to still meet the required deadline.

### **GRADES:**

Grades will be available to students in a timely manner. Students can easily keep track of their grades from our frequent communication. In case of any doubt, students are encouraged and welcome to contact me for clarification. Your semester grade will be based on a combination of the performance you demonstrated on each of the above types of assignments, as shown below.

Active class participation	3%
Homework assignments	20%
Quizzes	15%
Exams	42%
Presentation	20%

The nominal percentage-score-to-letter-grade conversion for CS 5350/6350 is as follows:

- 90% or higher is an A
- 80-89% is a B
- 70-79% is a C
- 60-69% is a D
- Below 60% is an F

Important Note: Regardless of your standing in the class at that time, you need to earn a C or better at the final exam to pass the course.

### **EXPECTATIONS**

You should expect to spend at least six hours per week outside of lecture on reading and homework.

### **ATTENDANCE POLICY:**

This course is 100% online and live. Virtual attendance is mandatory. Please refer to the Active Participation section (above) for more details.

### **LATE WORK POLICY:**

Late work will be penalized by 10 points each day up to 3 days. After that, the work will be graded 0. However, regardless of the individual grades on assignments, in order to pass the class, you need to have submitted all assignments by the end of the semester.

### **INCOMPLETE POLICY:**

Incomplete grades may be requested only in exceptional circumstances after you have completed at least half of the course requirements. Talk to me immediately if you believe an incomplete is warranted. If granted, we will establish a contract of work to be completed with deadlines.

### **DROP POLICY:**

Every semester, some students drop courses. We, instructors, completely understand and respect that. We only hereby ask students to inform us, ideally before, but in the worst-case right after, of their intention to drop the course. This is really important for us as it possibly informs us of ways in which to better serve our students.

Fall Semester Drop/Withdrawal Deadline: October 30.

To drop this course, please contact your academic advisor and then the [Registrar's Office](#) to initiate the drop process. If you do not, you are at risk of receiving an "F " for the course.

### **CLASS RECORDINGS**

The use of recordings will enable you to have access to class lectures, group discussions, and so on in the event you miss a synchronous meeting due to illness or other extenuating circumstance. Recordings will be available on the relevant channels of our MS Team (lectures in the General channel).

Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA) and UTEP's acceptable-use policy. A recording of class sessions will be kept and stored by UTEP, in accordance with FERPA and UTEP policies. Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. You may not share recordings outside of this course. Doing so may result in disciplinary action. More information about student privacy can be found here: [https://www.utep.edu/provost/\\_Files/docs/curriculum/UT-system-online-learning-student-privacy-faqs.pdf](https://www.utep.edu/provost/_Files/docs/curriculum/UT-system-online-learning-student-privacy-faqs.pdf).

### **TECHNOLOGY REQUIREMENTS:**

Course content is delivered via the Internet through [MS Teams](#) for most of our operations and exams will be delivered through [Blackboard](#). Ensure that you have MS Teams installed, that your UTEP e-mail account is working, and that you have access to the Web and a stable web browser. When using Blackboard, know that Google Chrome and Mozilla Firefox are the best browsers; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need to have access to a computer/laptop and a microphone. If you need to, know that you can download Microsoft Office programs (including Excel, PowerPoint, Outlook and more) for free via UTEP's Microsoft Office Portal. Click the following link for more information about [Microsoft Office 365](#) and follow the instructions.

IMPORTANT: If you encounter technical difficulties beyond your scope of troubleshooting, please contact the UTEP [Help Desk](#) as they are trained specifically in assisting with technological needs of students. Please do not contact me for this type of assistance. The Help Desk is much better equipped than I am to assist you!

### ACCOMMODATION POLICY:

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the [UTEP Center for Accommodations and Support Services](#). If you have a disability and need classroom accommodations, please contact the Center for Accommodations and Support Services (CASS) at 747-5148 or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass). CASS' staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.

### COVID-19 Accommodations

This course is entirely online synchronous (that is: online and live). However, in case this is relevant to your situation as it relates to other courses you may be taking, know that students are not permitted on campus when they have a positive COVID-19 test, exposure or symptoms.

### SCHOLASTIC INTEGRITY:

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Scholastic dishonesty includes, but not limited to cheating, plagiarism, collusion, and submission for credit of any work or materials that are attributable to another person.

**Cheating** may involve:

- Copying from the test paper of another student
- Communicating with another student during a test to be taken individually
- Giving or seeking aid from another student during a test to be taken individually
- Possession and/or use of unauthorized materials during tests (i.e. crib notes, class notes, books, etc.)
- Substituting for another person to take a test
- Falsifying research data, reports, academic work offered for credit

**Plagiarism** is:

- Using someone's work in your assignments without the proper citations
- Submitting the same paper or assignment from a different course, without direct permission of instructors

To avoid plagiarism, see this [website about avoiding plagiarism](#).

**Collusion** is: Unauthorized collaboration with another person in preparing academic assignments

**Important!** When in doubt on any of the above, please contact your instructor to check if you are following authorized procedure. [Also, please check the UTEP's Handbook of Operating Procedures at: hoop.utep.edu.](#)

Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Any student who commits an act of scholastic dishonesty is subject to discipline. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for possible disciplinary action. To learn more [HOOP: Student Conduct and Discipline](#).

## STUDENT RESOURCES:

UTEP provides a variety of student services and support:

- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the [Helpdesk](#) via phone (915-747-4357), email ([helpdesk@utep.edu](mailto:helpdesk@utep.edu)), [chat](#), or [website](#).
- [University Writing Center \(UWC\)](#): Submit papers to [UWC](#) for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.
- [Military Student Success Center \(MSSC\)](#): UTEP welcomes military-affiliated students to its degree programs. The Military Student Success Center and its dedicated staff (many of whom are veterans and students themselves) are there to help personnel in any branch of service to reach their educational goals.
- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

[More complete and updated information can be accessed at this address.](#)

## COURSE CALENDAR:

**CS5350/CS6350 MAJOR (TENTATIVE) DEADLINES:** excluding extra work assigned in class and mini labs  
Excluding HOMEWORK from Textbook or given in class

		IN CLASS (Tentative)	TEXTBOOK READING ASSIGNMENT	AT-HOME EXAMS on BLACKBOARD and other deadlines
W1	24-Aug	Intro of course, mode of instruction (including syllabus), review activities		
	26-Aug	Group activities on reviews		
	29-Aug			Introduce yourself, your research, etc. (instructions on MS Teams)
W2	31-Aug	General intro to algorithms	Intro	
	2-Sep	General intro to algorithms	Chapter 1	
	5-Sep		Chapter 2.1	
W3	7-Sep			
	9-Sep	Starting with algorithm analysis	Chapter 2.2	
	12-Sep		Chapter 2.3	
W4	14-Sep			Loop invariants (instructions on MS Teams)
	16-Sep	Growth function, asymptotic notations	Chapter 3	
	21-Sep	Review of divide and conquer	Chapter 4.1 or Chapter 4.2	
W5	23-Sep	Analysis of divide and conquer algorithms?	Chapter 4.3,4,5	
	28-Sep	Analysis of divide and conquer algorithms?		PRESENTATIONS due
W6	30-Sep	Revisiting sorting algorithms	Chapters 6,7,8	
	5-Oct	Revisiting sorting algorithms		
W7	7-Oct			EXAM 1 posted + Chapter 9 summary (instructions on MS Teams)
	12-Oct	Review	Chapter 9	
W8	14-Oct	Other common activities		
	14-Oct	Other common activities	Chapter 15	EXAM 1 due
W9	19-Oct	Dynamic Programming		
W9	21-Oct	Dynamic Programming	Chapter 16	
W10	26-Oct	Greedy Algorithms		
	28-Oct	Greedy Algorithms	Chapter 22	Chapter 15 or 16 summary (instructions on MS Teams)
W11	2-Nov	Elementary Graphs Algorithms	Chapters 23, 24	
	4-Nov	Shortest Path Algorithms	Chapter 25	
W12	9-Nov	Shortest Path Algorithms	Chapter 26	
	11-Nov	Maximum flow algorithms		
W13	16-Nov	Maximum flow algorithms		EXAM 2 posted
	18-Nov	Review		
W14	23-Nov	TBA	Chapters or articles selected by the class	EXAM 2 due
	25-Nov	TBA		Chapter 26 summary and application
W15	30-Nov	TBA		PRESENTATIONS due
	2-Dec	Review		
W16	7-Dec			
FINALS	Before 12/11	FINAL EXAM		COMPREHENSIVE EXAM (6 x 30 minutes)

## NETIQUETTE:

Please follow UTEP's [rules for online courses](#). They are available for you to read below. Here is also a link where you can access [the core rules of netiquette](#).

# NETIQUETTE GUIDE FOR ONLINE COURSES

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.

## SECURITY

Remember that your password is the only thing protecting you from pranks or more serious harm.

- Don't share your password with anyone
- Change your password if you think someone else might know it
- Always logout when you are finished using the system

## GENERAL GUIDELINES

When communicating online, you should always:

- Treat instructor with respect, even in email or in any other online communication
- Always use your professors' proper title: Dr. or Prof., or if you in doubt use Mr. or Ms.
- Unless specifically invited, don't refer to them by first name.
- Use clear and concise language
- Remember that all college level communication should have correct spelling and grammar
- Avoid slang terms such as "wassup?" and texting abbreviations such as "u" instead of "you"
- Use standard fonts such as Times New Roman and use a size 12 or 14 pt. font
- Avoid using the caps lock feature AS IT CAN BE INTERPRETTED AS YELLING
- Limit and possibly avoid the use of emoticons like :) or ☺
- Be cautious when using humor or sarcasm as tone is sometimes lost in an email or discussion post and your message might be taken seriously or offensive
- Be careful with personal information (both yours and other's)
- Do not send confidential patient information via e-mail

## EMAIL NETIQUETTE

When you send an email to your instructor, teaching assistant, or classmates, you should:

- Use a descriptive subject line
- Be brief
- Avoid attachments unless you are sure your recipients can open them
- Avoid HTML in favor of plain text
- Sign your message with your name and return e-mail address
- Think before you send the e-mail to more than one person. Does everyone really need to see your message?
- Be sure you REALLY want everyone to receive your response when you click, "reply all"
- Be sure that the message author intended for the information to be passed along before you click the "forward" button

## MESSAGE BOARD NETIQUETTE AND GUIDELINES

When posting on the Discussion Board in your online class, you should:

- Make posts that are on topic and within the scope of the course material
- Take your posts seriously and review and edit your posts before sending
- Be as brief as possible while still making a thorough comment
- Always give proper credit when referencing or quoting another source
- Be sure to read all messages in a thread before replying
- Don't repeat someone else's post without adding something of your own to it
- Avoid short, generic replies such as, "I agree." You should include why you agree or add to the previous point
- Always be respectful of others' opinions even when they differ from your own
- When you disagree with someone, you should express your differing opinion in a respectful, non-critical way
- Do not make personal or insulting remarks
- Be open-minded