CS 2202 **Syllabus** **Spring 8W2 2021**
CS 2202 MW 3pm-4:20am F 10am-11am ONLINE

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Hours: TBA
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Online Course Access Points
Homework and Quizzes: Gradescope
Synchronous Meetings Blackboard

Prerequisites: : CS 2101 and MATH 1411 with a grade of C or better. This is only a mathematical maturity requirement.

Course Objectives:

Upon successful completion of the course, you apply the fundamental techniques of counting. You will identify and model problems with graphs and trees. You will reinforce your familiarity with induction and recursion and their relevance to computer science. Also, you will have a general understanding of why knowing how to model problems using graphs and trees is crucial in many computer science areas.

In this class, students will be expected to be active learners, and develop an understanding of the essential connections/relevance of the content of this course with their computer science education.

Finally, they will develop team-working skills, critical-thinking skills, and professionalism.

hangindent=2em **Textbook**

Discrete Mathematics An Open Introduction, 3rd edition will be one of our sources, you can find it in its author's website. Besides, we will select some topics from the book *Discrete Mathematics and its Applications by K. Rosen, 7th Ed.* This book is available in our UTEP library.

Required Reading: Read each section that we cover in class, both before and after class. Skim the section before class, even if you do not understand it fully, to have some idea of what we will be doing in class. Read it more carefully after class to clarify and fill in details you missed in class.

Warning: Sometimes, we will not "cover" all the material from a section in class, but instead focus on a particular aspect of the section. In such cases, I will point out in class which other parts of the section I expect you to read on your own.

Grading

Grades are communicated to students in a timely manner. It is the students' responsibility to keep track of their grades by compiling the grades they receive. Your term grade will be based on a combination of homework assignments, weekly quizzes, class participation, one midterm exam, and a final exam.

- 40% Homework
- 15% Quizzes
- 40% Exams (1 mid-term exam and 1 final exam)
- 5% Class participation (includes on-time lecture attendance, active participation in class, completion of any quizzes for attendance and survey purposes)

The nominal percentage-score-to-letter-grade conversion for CS 1190 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

Note: Regardless of your standing in the class at that time, you need to earn a 65 or better at the final exam to pass the course

Expectations

Class Participation: Attendance at 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 (at first you will have to sign in but as time goes the instructor will know you and mark you present without your help) and will count towards your class participation grade. Students should notify the instructor prior to missing a session if at all possible, and certainly right after if earlier was not possible. The instructor will allow two unexcused absences per semester before having the option to deduct points from the final grade (5 points per subsequent unexcused absence). It is the student's responsibility to obtain the content covered during missed class(es). Participation points also include completing post-lecture and post-labs online quizzes (when requested) that are administered as surveys to monitor students' overall progress and potential struggles.

Quizzes: The purpose of each quiz is to ensure that students are staying current with the weekly reading and homework assignments, and to verify that they have acquired the skills developed in class. Quizzes will be administered approximately once a week. There will be no make-up on missed quizzes.

Homework: Reading and homework assignments will be announced in class and/or posted on piazza (under the Homework section of Resources). If you miss a lecture session, it is your responsibility to find out what you missed. You should expect to spend at least two hours per week outside of lecture on reading and homework assignments and reviews. Most of your homework will be work assigned on Gradescope: completing the assigned activities on time will be crucial to your success in the class (since these activities prepare you for classwork) and to getting a good grade (since late completion will be penalized).

Exams: There will be one midterm exam and one final exam. These exams together will weigh 50% of your overall final grade for CS2202. Because the exams contribute so heavily to your total grade, it is vital that you do well on them. If you have test-taking difficulties in general or if you have difficulties with our tests in particular, please come and let me know as soon as possible and/or request appropriate accommodation from UTEP's Center for Accommodation and Students' Services. The purpose of the midterm exam is to allow you to demonstrate mastery of course concepts covered thus far during the semester. The mid-term exam will take place during the regular lecture session and is tentatively scheduled around half of the minimester. 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 65% or better on the final exam to pass this course. If you have a scheduling conflict (e.g., if you are taking a final at EPCC) or if you are scheduled for three final exams in one day, see your instructor in advance for accommodation, before the end of the minimester. The final exam schedule is available online. It is the students' responsibility to keep informed.

Policies

Academic dishonesty: It is UTEP's policy, and mine, for all suspected cases or acts of alleged scholastic dishonesty to be referred to the Office of Student Conduct and Conflict Resolution for investigation and appropriate disposition. See Section II.1.2.2 of the Handbook of Operating Procedures.

COVID-19 Accommodations: Students are not permitted on campus when they have a positive COVID-19 test, exposure or symptoms. If you are not permitted on campus, you should contact me as soon as possible so we can arrange necessary and appropriate accommodations. (classes with on-campus meetings) Students who are considered high risk according to CDC guidelines and/or those who live with individuals who are considered high risk may contact Center for Accommodations and Support Services (CASS) to discuss temporary accommodations for on-campus courses and activities.

NETIQUETTE As we know, sometimes communication online can be challenging. It's possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action.

- Always consider audience. This is a college-level course; therefore, all communication should reflect polite consideration of other's ideas.

- Respect and courtesy must be provided to classmates and to the instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.

Courtesy: We all have to show courtesy to each other, and the class as a whole, during class time. Please arrive to class on time (or let me know when you have to be late, and why); do not engage in side conversations when one person (me, or another student) is talking to the whole class; turn off your cell phone (or, for emergencies, at least set it to not ring out loud), and **do not** engage in phone, email, or text conversations during class.

Disabilities: If you have, or suspect you have, a disability and need an accommodation, you should contact the Center for Accommodations and Support Services (CASS) at 747-5148, cass@utep.edu, or Union East room 106. You are responsible for presenting to me any CASS accommodation letters and instructions.

Exceptional circumstances: If you anticipate the possibility of missing large portions of class time, due to exceptional circumstances such as military service and/or training, or childbirth, please let me know as soon as possible.

Detailed Learning Outcomes

Level 1: Knowledge and Comprehension. Level 1 outcomes are those in which the student has been exposed to the terms and concepts at a basic level and can supply basic definitions. On successful completion of this course, students will be able to describe, at a high level:

1. Identify types of graphs and trees appearing in computer science.
2. State the main counting theorems.

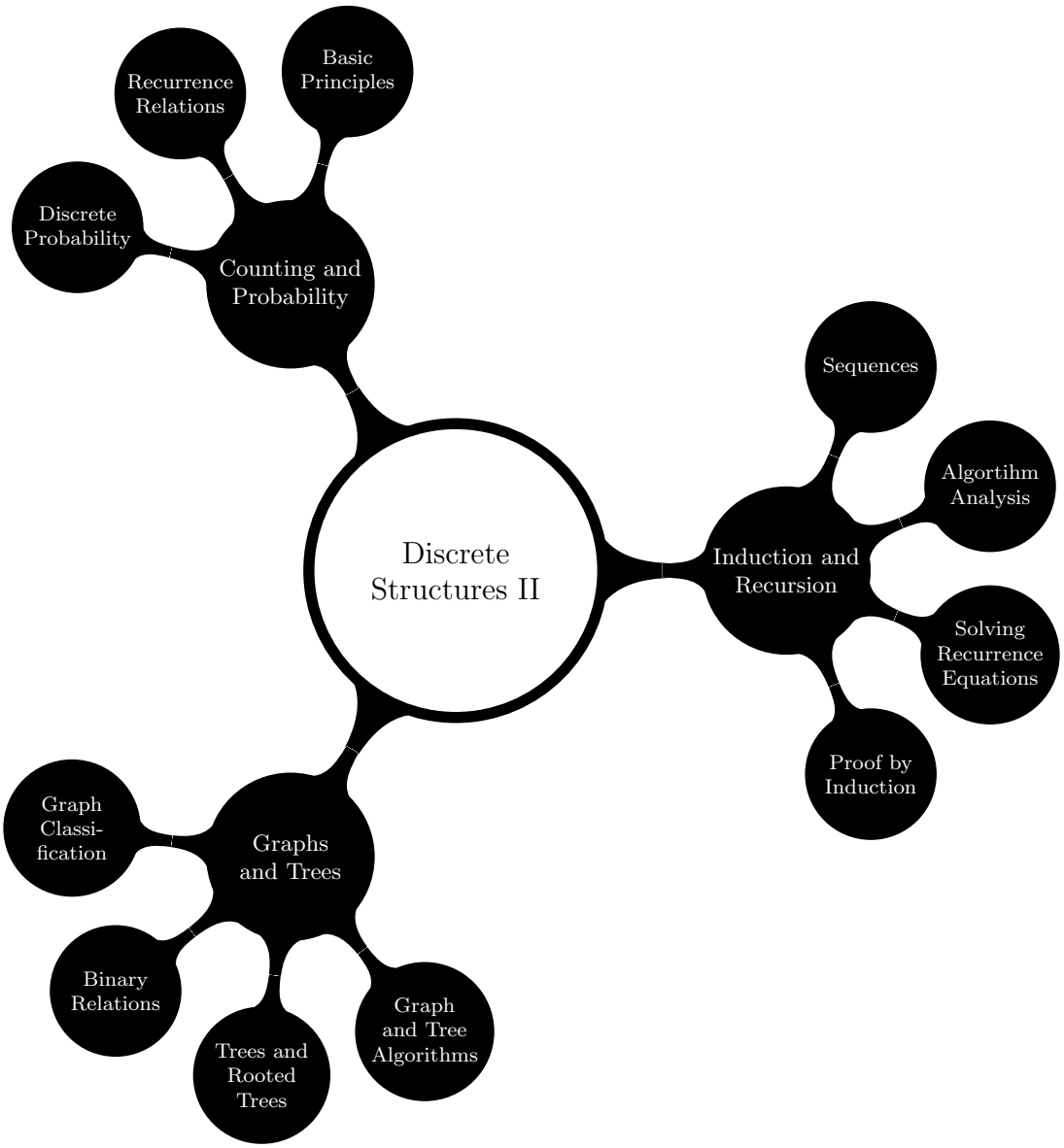
Level 2: Application and Analysis. Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details. Upon successful completion of this course, students will be able:

1. Articulate what counting is and how relevant it is to computer science
2. Apply the basic principles of counting.
3. Model combinatorial problems using graphs and trees.
4. Describe various types of graphs and their common properties.
5. Identify trees as a fundamental structure in modeling computer science problems.

Level 3 Outcomes: Synthesis and Evaluation. Level 3 outcomes are those in which the student can apply the material in new situations. This is the highest level of mastery. On successful completion of this course, students will be able to use the syntax and semantics of a higher-level language to express solutions to programming problems, including the correct use of:

1. Reason about the complexity of algorithms using counting techniques and properties of graphs
2. Model computer science problems using graphs and trees
3. Lay out a proof plan for existential and universal proofs, be able to identify shortcomings of some types of proving strategies
4. Identify an inductive structure of a set: use it to conduct an inductive proof and to set a recurrence relation.

Concept Map:


Discrete Structures II
Counting and Probability
Basic Principles
Recurrence Relations
Discrete Probability
Induction and Recursion
Sequences
Algortihm Analysis
Solving Recurrence Equations
Proof by Induction
Graphs and Trees
Graph Classi-fication
Binary Relations
Trees and Rooted Trees
Graph and Tree Algorithms