

CS1190 Discrete Structures

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Course Objectives: Upon successful completion of the course, you will know and be able to use the basic algebra of sets and of logic. You will be able to identify and use common classes of relations. You will know the basic properties of arbitrary functions. You will be familiar with induction and recursion, and their relevance to computer science. In particular, you will be introduced to the concept of recurrence relations. You will have a general understanding of why knowing how to solve counting problems involving combinations and permutations is important in computer science. 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.

Prerequisite: MATH 1508 with a grade of C or better.

Logistics:

Lecture sessions: W 12:30p.m. -1:20 p.m. in LART 204

Instructor: Dr. Julio Urenda – jcurenda@utep.edu – office room: LIB 504

Office hours: MF 12:25pm-1:25pm and W 10:25am-11:25am

Textbook: *Discrete Math*, by Zybooks, available at zybooks.zyante.com. To subscribe to your textbook, please enter the following code:

UTEPCS1190CeberioFall2018

Communication platform: This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com.

Find our class page at: piazza.com/utep/fall2018/cs1190/home

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 semester grade will be based on a combination of homework assignments, weekly quizzes, class participation, 1 mid-term exam, and a final exam.

The approximate percentages are as follows:

- 30% Homework
- 20% Quizzes
- 45% 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 your online zybook: 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 CS1190. 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 week 7-8. 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 week 13**. The final exam schedule is available online. It is the students' responsibility to keep informed.

Resources

Special Accommodations: 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, 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. CASS' staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.

Scholastic Dishonesty: Any student who commits an act of scholastic dishonesty is subject to discipline. 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 is: 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: <http://sa.utep.edu/osccr/wp-content/uploads/sites/8/2012/09/Avoiding-Plagiarism.pdf>

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.

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. Counting and its relevance to computer science
2. Recurrence relations

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. Logical reasoning for propositional logic: truth tables.
2. Predicate logic, including writing predicate logic expressions and basic reasoning: translation and inference rules.
3. Sets and functions: union, intersection, complement and product; injective, surjective and bijective functions; and combinations and permutations.

4. Induction and recursion: construct recurrence relations and basic proofs by mathematical induction.

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 pseudocode correct use of:

1. Propositional logic: propositions and operators, evaluation of propositions, conditional statements, and logical equivalence
2. Induction and recursion: identify problems that can be modeled by recurrence relations hypothesize and prove new properties.

Tentative Schedule:

Week	Topic
1	propositional logic and truth tables
2	logical connectives, sets and their operators
3	functions and binary relations
4	equivalence relations and testing
5	Inductively defined sets and functions
6	Inductively defined sets and functions
7	Recurrence relations: sequences (Recursion)
8	Recurrence relations: properties (Recursion)
9	Review
10	Mathematical Induction and first order logic
11	Mathematical Induction and first order logic
12	Counting: the three fundamental principles
13	Counting: combinations
14	Counting: permutations
15	Final review