

**Foundations of Mathematics for Computer Science**  
**CS 261, Section 501, Spring 2021**  
**UNM-Valencia**  
**Fully Online**  
**Remote Scheduled Zoom Lectures**  
**Tuesday and Thursday, 3:00 - 4:15 PM**

Instructor: Greg Barnett

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Tutoring Hours: M-Th  
4:30-6:30 PM in Zoom  
or by appointment

## **1 Overview**

Welcome to CS 261. Here is the UNM course description.

Introduction to the formal mathematical concepts of computer science for the beginning student. Topics include elementary logic, induction, algorithmic processes, graph theory and models of computation.

Prerequisite: (MATH 1240 with a grade of “A” or better) or (MATH 1512 with a grade of “B-” or better).

## **2 Topics**

Upon successful completion of the course, students will understand fundamental concepts from the following categories, and be prepared to use their discrete mathematics skills to solve a wide variety of problems.

### **2.1 The Foundations**

- A. Propositional Logic and Equivalences
- B. Predicates and Quantifiers
- C. Rules of Inference
- D. Proofs

## **2.2 Basic Structures**

- A. Sets and Operations
- B. Functions

## **2.3 Algorithms**

- A. The Growth of Functions
- B. Complexity of Algorithms

## **2.4 Number Theory**

- A. Divisibility and Modular Arithmetic
- B. Integer Representations and Algorithms
- C. Primes and Greatest Common Divisors
- D. Congruences

## **2.5 Induction and Recursion**

- A. Mathematical Induction
- B. Strong Induction and Well-Ordering
- C. Recursive Definitions and Structural Induction

## **2.6 Relations**

- A. Relations and their Properties
- B. Equivalence Relations

## **2.7 Graphs**

- A. Graphs and Graph Models
- B. Representing Graphs and Graph Isomorphism
- C. Connectivity

## **3 Required Text**

- Discrete Mathematics and its Applications, 8th Edition, Kenneth Rosen.
- The electronic textbook will be automatically available through Blackboard. If you already have the book or would like to purchase a physical copy, then you will need to opt out of eBook access to avoid payment.

## 4 Attendance Policy

Each student is required to attend lectures each week, and students should use this opportunity to get real-time feedback from me and the rest of the class. If a student does not attend lectures for two weeks in a row, I reserve the right (but not the obligation) to drop the student from the class. If you stop submitting your coursework for any reason, it is your responsibility to drop the class, or risk getting a failing grade.

**Notification:** Zoom lectures will be automatically recorded. I will post them to UNM Learn.

## 5 Technology

Students are expected to be able to

- Sign in and navigate [UNM Learn](#)
- Capture and submit hand-written work digitally, using a smartphone, tablet, digital camera, or other device.

## 6 Course Structure

The course content includes the following. In all cases, your work will be submitted as a file response in UNM Learn, and you are required to show your steps to earn full credit.

- Homework (200 points)
  - Assigned problems from the textbook
  - 13 Homework assignments (20 points per assignment)
  - Lowest three scores are dropped
- Quizzes (100 points)
  - 26 Quizzes (4 points per quiz)
  - Lowest score is dropped
- Midterm Exam (100 points)
  - Timed Exam (2 hours)
- Final Exam (150 points)
  - Timed Exam (3 hours)
- Total (550 points)

Late homework assignments and quizzes will not be accepted, unless there is a valid reason. Exams may be made up in the event of emergency or extenuating circumstance only.

## 7 Grading Policy

Your grade will be calculated as follows.

<u>Point Total</u>	<u>Grade</u>
[539,550]	A+
[506, 539)	A
[495,506)	A-
[484,495)	B+
[451,484)	B
[440,451)	B-
[429,440)	C+
[385,429)	C
[374,385)	D+
[341,374)	D
[330,341)	D-
[0,330)	F

## 8 Netiquette

One of the overriding principles in online conversations is to “craft your responses effectively.” It is sometimes difficult to remember that there are real people reading posted messages. This is especially true of online communication where others do not have the opportunity to see body language or hear tone of voice; therefore, misunderstandings are more likely.

Please, follow these guidelines in all of your online responses and discussion postings.

- Honor everyone’s right to an opinion.
- Respect the right of each person to disagree with others.
- Respond honestly but thoughtfully and respectfully; use language which others will not consider foul or abusive. You may also use emoticons to convey a lighter tone.
- Respect your own privacy and the privacy of others by not revealing information which you deem private and which you feel might embarrass you or others
- Be prepared to clarify statements which might be misunderstood or misinterpreted by others.

### A Special Note About Anger

- Do not send messages that you have written when you are angry, even anonymous ones. In the online world, angry messages are known as “flaming” and are considered bad behavior. Venting and flaming are two different things. It is possible to vent without becoming “ugly.” Stick to the facts of what is causing you frustration.
- Do not send messages that are written all in upper case; this is the visual equivalent of SHOUTING. It is considered aggressive and is considered bad behavior. If you ever feel like shouting a message, take a deep breath and wait until you have calmed down before responding. Then, respond in a calm and factual manner.

## **9 Academic Integrity**

We will follow university policy on academic integrity.

Having academic integrity is paramount to your success in any class. Plagiarism or cheating is not tolerated. Any instance of this will result in a grade of zero for that assignment. Here is the link to the UNM Academic Dishonesty Policy: <https://policy.unm.edu/regents-policies/section-4/4-8.html>. The policy states:

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or who otherwise fails to meet the expected standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.

“Academic dishonesty” includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

## **10 Students with Disabilities**

If you have a documented disability, please provide me with a copy of your letter from Equal Access Services as soon as possible to ensure that accommodations are provided in a timely manner.

## **11 EQUAL OPPORTUNITY AND NON-DISCRIMINATION:**

In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered “responsible employees” by the Department of Education (see page 15 of this [link](#)). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity ([oeo.unm.edu](http://oeo.unm.edu)). For more information on the campus policy regarding sexual misconduct, see: <https://policy.unm.edu/university-policies/2000/2740.html>.