Course Syllabus
Discrete Mathematical Structures
Math 2513, Section 002
Fall 2020

Course Instructor:
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Course Assistant:
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Office Hours: Times for on-line weekly problem review sessions and office hours will be posted at the course web site, and links will be provided in Canvas. You are always welcome to submit questions/comments via email as well.

Course Web Site: The web site at *http://www.math.ou.edu/∼amiller/2513* is dedicated to this course and will be used as a means for disseminating information and making materials available to the class. Homework assignments will be posted there, along with other basic information relevant to the course.

Brief Description: The course description which appears in the OU General Catalog gives a condensed outline of topics to be covered:

> 2513 Discrete Mathematical Structures. *Prerequisite: 2423 or concurrent enrollment. A course for math majors or prospective math majors. Provides an introduction to discrete concepts such as finite sets and structures, and their properties and applications. Also exposes students to the basic procedures and styles of mathematical proof. Topics include basic set theory, functions, integers, symbolic logic, predicate calculus, induction, counting techniques, graphs and trees. Other topics from combinatorics, probability, relations, Boolean algebras or automata theory may be covered as time permits. (F, Sp, Su)*

Discrete mathematics involves the study of objects which are distinct and separated from each other. For example, finite sets and the set of integers are discrete sets, while the set of real numbers would be considered to be a continuous (or non-discrete) set of objects. This places the subject of discrete mathematics at the opposite end of the spectrum from the study of calculus. Typical problems in discrete mathematics involve either listing or counting the elements of a given discrete set. Often we are interested in sets which carry additional structures such as an operation (addition, multiplication, concatenation, union or intersection, for example) or an inequality ($\leq$ or subset inclusion, for example) or an "equivalence relation" (equivalence of fractions or congruence modulo 3, would be examples). When present, such structures are likely to be instrumental in enumerating and counting processes. The basic concepts of discrete mathematics tend to lend themselves to being axiomatized (which means building a subject up starting from basic elementary definitions), and the subject is particularly well-suited for a first non-calculus course for math majors. Through this course, you can expect to develop your mathematical vocabulary and maturity, and to enhance your ability to create, read and analyze mathematical arguments. With both the subject itself, as well as the experience gained by working with mathematical arguments, the course is intended to provide an important foundation for moving into higher level math courses such as real analysis, abstract algebra, math modeling, geometry and topology.

Textbook: The course textbook will be *Book of Proof (3rd edition)*, by Richard Hammack. This book is available in pdf format at www.people.vcu.edu/∼rhammack/BookOfProof . If you prefer having a bound hard copy of this book it can also be purchased through Amazon or other sources. (The blue version is edition 3.2, which is most recent, but any version of edition 3 can be used.) There are many nice explanations and problems in this book. However we will not always follow Hammack's linear progression of topics.

In addition to Hammack's book, we will use a variety of freely available on-line sources and specially created course handouts for both reading and background reference throughout the semester. Links to these various materials will be provided at the course web site. If confusions arise or if you get stuck with any of the reading or reference materials, please don't hesitate to ask for clarification!

Class Times: The class meetings form the backbone for all course activities. We will meet in PHSC 201 on Mondays and Wednesdays (9:45-10:35 AM), and on-line using Zoom on Fridays (9:45-10:35 AM). Links to the Zoom sessions will be posted on the course Canvas page. The Friday sessions will be devoted to students working on problem sets in teams of 3, 4, or 5. Routine attendance at all class meetings is expected of students, and absolutely essential for success.

Exams: There will be two midterm tests and a final exam. One midterm will be scheduled in late September or early October, and the other in early November. (Precise dates will be announced in class at least a week in advance.) The final exam will take place from 8:00 until 10:00 AM on Tuesday, December 15.

Grading: Course grades will be determined according to the breakdown:

Assignments, Quizzes, Group Work:	*45%*
Two Midterms:	*15% each*
Final Exam:	*25%*
Course Notebook:	*3% bonus*

The course grade will be determined based on a standard scale:

A: 90%, B: 80%, C: 70%, D: 60%, F: below 60%

Course Notebook: You are strongly encouraged to compile a complete course notebook over the semester. This should consist of daily notes from class, homework papers and other handouts—all arranged in easy to access chronological fashion. The bonus can be earned by submitting the notebook towards the end of the semester. It will be graded on completeness and organization.

Assignments, Quizzes and Group Work: Homework assignments, in-class quizzes and group work will be given regularly over the semester. Late homework papers cannot be accepted, and there will be no exceptions to this rule. In determining the assignment portion of the total course grade at the end of the semester, the lowest 25% (roughly) of the assignment and quiz grades will be dropped at the end of the semester. Homework assignments should be written on 8.5 by 11 paper and folded lengthwise with your name clearly marked on the outside. You are allowed, and encouraged, to discuss assignments with classmates at the rough draft stage. However you must prepare your own written version of the final draft

independently. Assistance on homework and related problems will always be available during the weekly problem sessions and office hours.

Recommendations: The best way to succeed in this course is to focus on learning about the concepts and the writing strategies that we will be discussing. Developing a genuine interest in the subject and an inquisitiveness about its concepts can really help to motivate your work as you progress through the semester. Never be afraid to ask off-the-wall questions to yourself, your classmates or your instructor as this is one of the best ways to advance your understanding of a subject. The only 'bad' question is a question you have that you don't ask about.
Please be very patient in producing your work and allow yourself ample time to prepare assignments carefully. Virtually every problem should involve a three stage process where first you do some scratch work in thinking about potential procedures to use in solving the problem, then you make a first attempt at organizing your explanations, and finally you refine your solution to make it coherent and understandable to the reader. Please do not turn in scratch work with your assignments.

Covid Adjustments: Students that test positive for the virus, or are placed in quarantine, will need to contact the course instructor as soon as possible in order to discuss arrangements for continuing their involvement with the course. We will adhere to all of the university distancing guidelines, and masks must be worn in class at all times. Modifications to the course syllabus may be required if university guidelines change as the semester progresses.

Student Disabilities: The University of Oklahoma is committed to providing reasonable accommodations for any students with disabilities. If you require special accommodation in the course please discuss this with the instructor as soon as convenient so that appropriate steps can be taken to ensure your full participation in the course and to facilitate your academic opportunities. Students with disabilities should be registered with the Disability Resource Center *drc.ou.edu*.

Religious Holidays: It is the policy of the University to excuse absences of students that result from religious observances and to provide without penalty for the rescheduling of exams and other required class work that may fall on religious holidays. Please contact the instructor well in advance about this so that appropriate arrangements can be made.

Academic Misconduct: The rules governing cases of academic misconduct will be strictly adhered to in this course. Information may be found at *http://integrity.ou.edu* or through the Student Conduct Office *http://studentconduct.ou.edu*.