Course Instructor:
Andy Miller, office: PHSC 801, email: amiller@math.ou.edu

Course Assistant:
Bryant Wilson, office: PHSC 910, email: bwilson@math.ou.edu

Office Hours: Weekly office hours will be posted at the course web site, and on occasion we can make arrangements to meet at a different time. Also please don’t hesitate to email at any time if you have questions about any aspect of the course.

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. The fundamental 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 (≤ or subset inclusion, for example) or an "equivalence relation". When present, these structures are instrumental in enumerating and counting processes. The basic concepts of discrete mathematics lend themselves to being axiomatized (which means building the subject up starting from basic elementary definitions) and so 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.
**Class Times:** The class meetings (MWF at 10:30-11:20 in PHSC 416) form the backbone for all course activities. Routine attendance at these meetings is expected of students, and absolutely essential for success. Class roll will be taken at the lectures as a reminder of the importance of this.

**Textbook:** During the first segment of the course we will use *Book of Proof (2nd edition)*, by Richard Hammack as a textbook. Later in the semester when we focus on concepts of discrete mathematics additional reading and study materials will be made available.

PLEASE NOTE WELL: The reading materials will form an important, heavily used asset in the class. It will always be assumed that you are reading and studying these materials as they are discussed in class. If confusions arise or if you get stuck with this reading then please don’t hesitate to ask about it during class or during office hours or problem sessions.

**Exams:** There will be three midterm tests and a final exam scheduled as follows:

- **Exam 1:** Friday, September 23
- **Exam 2:** Friday, October 21
- **Exam 3:** Monday, November 21
- **Final Exam:** Friday, December 16, 8:00–10:00 AM

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

- **Assignments and Quizzes:** 40%
- **Special Assignments:** 10%
- **Three Midterms:** 25%
- **Final Exam:** 25%

Please note that the assignments, quizzes and special assignments comprise a significant portion of the final grade. This grade will be determined based on a standard scale:

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

During the semester you are strongly encouraged to work on compiling a course notebook consisting of daily notes from class, homework papers and other handouts arranged in easy to access chronological fashion. At the end of the semester you can earn up to a 3 point bonus by displaying this to one of the course leaders.

**Assignments and Quizzes:** Homework assignments and in-class quizzes will be given regularly over the semester. Homework papers can either be turned in at class on the due date, or brought to the math office in PHSC 423 no later than 4:00 PM on the same day. 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 20% (roughly) of the assignment and quiz grades will be dropped at the end of the semester (not including special assignments). Each assignment will be graded out of 20 points. So, for example, if there are 20 assignments and quizzes then the 16 highest scores will contribute to the Assignments and Quizzes portion of the total semester score. 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 our weekly office hours, so please don’t hesitate to make use of this resource. In addition to the regular class assignments each student will be required to submit at least two special assignments over the semester. (Instructions for these assignments will be posted at the course web site.)

**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.

Please allow yourself ample time to prepare your assignments carefully. Virtually every problem should involve a two stage process where first you do some scratch work in thinking about potential procedures to use in solving the problem, and then you organize and refine your solution to make it coherent and understandable to the reader. Please don’t turn in scratch work with your assignments. One of the main obstacles for many of you in this course will be to break bad writing habits that you may have developed in previous high school and college math courses.

The importance of being at every class lecture can’t be over stated. Besides introducing new material, a key point of the lectures is that at any time the discussions may spark a deeper understanding of course concepts for you—this will be true even if you have lagged a little behind in your course preparation at a particular moment. In addition experience shows over and over again that students with poor attendance habits earn significantly lower course grades.

**Student Disabilities:** The University of Oklahoma is committed to providing reasonable accommodations for all students with disabilities. If you require special accommodation in the course please discuss this with me as soon as convenient so that we can take steps 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](http://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 me well in advance about this so that we can make appropriate arrangements.

**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](http://integrity.ou.edu) or through the Student Conduct Office [http://studentconduct.ou.edu](http://studentconduct.ou.edu).