Professor:	Dr. Chris Black
Office:	Snoqualmie Hall #302B
Office Hours:	Tuesdays 10:15 - 11:15, and by arrangement
Office Phone:	(425) 640-1574 x3871
Email :	blackc@cwu.edu

Required Text:	*How to Prove It: A Structured Approach*, Second Edition, Daniel J. Velleman, Cambridge University Press, 2006

Goals for course:

Upon completion of Math 260, students will:

- ... be able to understand and use logical terminology and symbolism, and to write the contrapositive and negation of a compound statement and determine its truth value;
- ... be able to present logically correct proofs of mathematical statements, using a variety of methods including mathematical induction and proof by contradiction, and be able to determine the veracity of a mathematical statement and then prove or disprove it;
- ...understand and prove theorems in areas which are basic to much of mathematics, including set theory, functions and relations, elementary number theory and cardinality;
- ... actively participate in the classroom dialogue, both as an individual and as a member of a small group;
- ... increase the use of precise mathematical language, both orally and in writing;
- ... gain sufficient mathematical maturity to be able to successfully undertake the advanced mathematics courses in the remainder of the Teaching Secondary Mathematics program.

Course Philosophy:

In this course, we will be using topics from many different branches of mathematics to illustrate different logical structures and methods of proof techniques. We will touch upon ideas in set theory, number theory, calculus, linear algebra, and other topics not listed here. Because modern mathematics is rooted in set theory, many of our ideas will be expressed using set-theoretic terminology. We will focus on learning to speak and write in concise mathematical language, and to formulate and prove our own propositions in areas that form the basis for advanced mathematics.

Probable Course Topics:

▷ Sentential and quantificational logic, including truth tables, connectives and set theory

▷ Proof strategies & techniques: negations, conjunctions, existence and uniqueness proofs

▷ Relations & functions

▷ Mathematical induction

▷ Cardinality & infinite sets

PARTICIPATION:

One of the goals of this course is to increase your comfort with precise mathematical language. Your future career in the classroom demands that you can communicate using correct mathematical language and symbols, clearly and succinctly, both orally and in writing. The best way to develop these communication skills is to actively participate in classroom activities, presentations, discussion and critiques. This course will be conducted seminar-style; I will act as a moderator while the students lead the discussion through questions and presentation of exercises and proofs to one another. I will answer questions and steer the discussion, however the momentum for the course will be created by the students themselves.

HOMEWORK:

Much of your work for this course will not be collected and graded. You will be assigned several problems from each section of the text; three of these are candidates for presentations (see below); two of these problems will be presented, and the third will be collected and graded. The majority of these problems will be proofs, which are expected to be written formally. Proofs will be graded according to the *Homework Writing Guidelines*. You may work in groups to discuss the homework problems, however the final versions should be written individually. **It is considered plagiarism to find solutions to proofs assigned as homework in other texts or on the internet.** You are invited to come see me for hints on homework problems.

HOMEWORK REWRITES:

The primary goal of this course is mastery of mathematical proof. However, it is not to be expected that this mastery will occur with only one attempt. Thus, graded proofs can be re-worked and re-submitted up to two times. If no numerical grade was assigned, then the proof **must** be rewritten; if the proof received a numerical grade, then you can decide whether or not to rewrite it to improve your score. The score on a rewrite replaces the original score for a problem. When I return homework papers, I will stamp them with the return date. You have one week from that date in which you can analyze your errors, re-write these proofs and return them to me.

PRESENTATIONS:

Each day, two or three students will present solutions to selected homework problems. Each proof presented will be graded out of 20 points: 10 points for the classroom presentation and 10 points for the written proof, which may be resubmitted if necessary. Students will be chosen at random to present their work. The highest three presentation scores of the quarter will count toward the course grade. Problems presented can be resubmitted if necessary.

EXAMS & FINAL EXAM:

Exams will be given as take-home exams, during which the only allowed sources are the professor and the textbook. For each take-home exam, one day of class will be used for individual consultation with the professor. Use of the internet, any other written source, or any person other than the professor is considered plagiarism and will result in a score of 0 on the exam. The final exam will take place on **Thursday, 12/10/10** from 9:00 - 11:00 am. The 100-point final exam will be scaled to 150 points for the final grade calculation.

ATTENDANCE/CITIZENSHIP:

Discussion, interaction, and group problem solving will all be important aspects of this course, which necessitate your attendance. Citizenship addresses your behavior and comportment with class members and the professor. We each need to be respectful of other students, other cultures, and differing ideas within our learning community. In particular, in a class where you are expected to critique each other's work, we need to keep our comments constructive.

GRADING:

Homework:	200 - 250 points, as needed
Take-Home Exams (2):	100 points each
Final Exam:	150 points
Presentations (3):	20 points each
Participation:	20 points
Attendance/Citizenship:	20 points

EMAIL:

To contact me outside of class time, please email blackc@cwu.edu. An email message will be answered much more promptly than a voice mail message. Be sure to include a relevant subject line in your email, as I often receive up to 50 email messages per day. *I do not answer email on Saturdays*, but will otherwise respond promptly. Assignments will not be accepted by email, unless under extreme circumstances with prior approval.

ACADEMIC HONESTY AND RESPECT:

Each of us should consider our placement at this institution to be a privilege. We need to have respect for one another, and for ourselves. In light of these facts, cheating in any form will not be tolerated. You are encouraged to work together on homework problems, however anything you turn in with your name on it should have been written by you alone. In a course where much of your grade is determined by your proof writing, plagiarism is a concern. The word "plagiarize" is defined by the New Oxford American Dictionary as "the practice of taking someone else's work or ideas and passing them off as one's own." Plagiarism includes, but is not limited to:

- Copying another student's work and submitting it as your own

- Submitting a proof copied from the internet

- Submitting a proof copied from another text

- Consulting **any** source other than the assigned text, your class notes or the professor on a take-home exam

Any incidence of plagiarism will not be tolerated, and will jeopardize your position in the program.

DISABILITY SERVICES:

Students with disabilities may arrange for academic adjustments by providing the professor with a copy of the "Confirmation of Eligibility for Academic Adjustments" from the Disability Support Services Office as soon as possible. To obtain this form contact Bree Callahan, director of Disability Support Services for the Westside University Centers at (206) 439-3800 ext. 3866 or by email at bcallaha@cwu.edu.