Instructor : Aaron Montgomery
Class : M–Th @ 2:00–2:50 in Samuelson 102
Office Hours : M @ 11am, T @ 1pm, Th @ 1pm & 3pm, and by appointment
Email : `montgoaa@cwu.edu` **Phone** : 963-1906
Optional Text : Velleman's **How to Prove It**

Textbooks:

There is no required text for this course. You can also scour the internet for information about this topic. However, for most of the problems I will assign, if you are scouring the internet for help, you are doing them wrong. If you want a reference text for this material. The following texts are the ones I have on my shelves:

- **Combinatorics** by Brualdi
- **Combinatorics and Graph Theory** by Harris, Hirst, and Mossinghoff
- **Discrete Mathematics and Its Applications** by Rosen
- **Concrete Mathematics** by Graham, Knuth, Patashnik
- **Mathematics for Computer Science** by Lehman and Leighton (2004) or Lehman, Leighton, and Meyer (2011)

Course Outcomes:

This course (and MATH 351) are designed to develop your proof writing skills to prepare you for later courses (the Abstract Algebra and the Analysis sequences in particular). To pass this course, you will need to be able to set up proofs independently and to be able to fully develop proofs that fit into the "follow your nose" pattern.

This course will introduce the basic concepts of combinatorics and graph theory, focusing on the use of Mathematical Induction.

Office Hours: I have four hours set aside for office hours each week. I will be in my office during those times, and you can drop in to ask questions. You can also email me, and we can set up an appointment to meet at other times. Typically, when you request an appointment, I will put together a list

of times I am available for the remainder of the week; you get to pick one, and (if it is still free) I'll put you in my calendar. When you come to office hours, be prepared.

If you are asking questions about a proof, I will expect you to be able to tell me the definitions of all the terms in the theorem and to construct some examples that may or may not satisfy the conditions of the theorem. If you cannot do these things, I will send you off to do them before I help you. Unlike using mathematics, doing mathematics (also known as proof writing) is not an activity that can be effectively mimicked. Do not expect to come to my office and watch me do an almost identical proof you are supposed to write. I will provide you with hints and examples to help you understand the concepts involved, and you will be expected to use this understanding to synthesize the proof. This means that asking lots of questions on Thursday is not a good way to have the homework done by Friday. Ask questions on Tuesday and Wednesday so that you have time to build an understanding by Thursday.

Graded Coursework

Homework: 140 Points — There will be 8 homework assignments (all assignments are posted on the website), each worth 20 points, with the lowest score dropped for a total of 140 points. After getting your homework returned, you will have one week during which you can attempt to rework problems you missed for reduced credit. Late homework is **not accepted**. Homework turned in one week after the due date will be graded with the reworked problems and assigned reduced credit. Each homework assignment should be submitted to Canvas as a single PDF file.

Much of your homework involves writing proofs. I expect proofs to be complete and follow the guidelines in the MATH 351 packet (posted on Canvas). Minimal points will be given for homework that requires me to rotate the page, squint to make out the words, or fill in the missing boilerplate. I will not spend my time doing the easy parts of your assignment for you. If you expect a good grade, you will need to at least make an effort to do the easy parts yourself.

One way to help me avoid squinting is to use LaTeX. This also makes it easy

for you to correct your work when you resubmit them to me. To encourage this, I will give you a **1 point bonus** for each assignment you turn in that is written in LaTeX(these bonus points will be awarded at the end of the quarter).

Exams: 110 Points — There will be two exams. A midterm (see Canvas for date) and a cumulative final exam (see CWU's standard final schedule for date and time). Exams will be in-class and will require you to be able to write proofs. The midterm will be worth 50 points, and the final exam will be worth 60 points.

Final Grades: 250 Points —

			≥ 233	A		≥ 225	A-
≥ 218	B+		≥ 208	B		≥ 200	B-
≥ 193	C+		≥ 183	C		≥ 175	C-
≥ 168	D+		≥ 158	D		≥ 150	D-

Cheating

I anticipate (and hope) that some of you will do your homework together. However, you are still expected to upload your homework individually and not a copy of a single set of solutions. Exams are intended to be taken on your own. If I find that you have cheated on an exam, you will receive a 0 on the exam and be reported to the Dean of Students.

Because it is so easy to share homework solutions in LaTeX format, I will expect each LaTeXed homework to use different formatting. That means using different labeling of problems using **textbf** or *textit*, different phrasing in transitional statements, different variable names, and so forth. This should happen naturally if you are writing up your homework independently.

Accommodations

Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. Students with disabilities should contact Disability Services to discuss a range of options to

removing barriers, including accommodations. Disability Services is located in Hogue 126. Call (509) 963-2214 or email ds@cwu.edu for more information.

In compliance with RCW 28B.137.010, Central Washington University makess every effort to deal reasonably and fairly with students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Students must present written notice to their instructor within the first two weeks of class listing the specific dates on which accommodations are required. Contact the Dean of Student Success at (509) 963-1515 for further information or questions.