# Welcome to Math 335 – Winter 2018

**2:00 - 2:50 M-Th in Black 226(??) and Bouillon 103**

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and by appointment

If modifications are made to this syllabus, students will be notified of changes in class and on Canvas.

**Text:** *Mathematics for Computer Science*, by Eric Lehman, F. Thomson Leighton, Albert R. Meyer, available freely on the web at https://people.csail.mit.edu/meyer/mcs.pdf as well as on Canvas. You may notice that one of the authors of this book, F. Thomson Leighton, is CEO Akamai Technologies, and Eric Lehman is a software engineer at Google – mathematics and computer science are complementary subjects. I have enjoyed reading this book; it has a lot of subtle humor woven into the technical information.

**Course Goals:** Math 335 introduces the topic of combinatorics, the mathematics of counting. You probably think you are pretty good at this already, after all you have 10 fingers and 10 toes, and you know there are 26 letters in the alphabet. But how many ways are there to assign a letter to each finger and toe if repetitions are allowed? If repetitions are not allowed? If the pinky fingers and big toes must be assigned vowels which cannot be repeated? If you simply have to choose 10 letters and order does not matter? These and other questions will be explored in the class.

We also introduce graph theory, but we don't mean the graph of a function. Instead a graph consists of vertices or nodes which can be connected by edges which may or may not have a directionality to them. One important application of graph theory is graph coloring. A coloring for a graph is valid only if two vertices that are connected by an edge then those two vertices are colored with two different colors. Verifying that a coloring is valid is easy, but figuring out the smallest number of colors for which there is a valid coloring is hard. Applications of graph coloring include managing scheduling conflicts.

The most important things for you to do in this class are to develop your persistence, your problem solving skills, your proof writing, and your mathematical communications skills. Being able to write up and communicate ideas using mathematically correct and clear language is crucial for success in this course, in subsequent courses, and for your career as a mathematician. As such, understanding why things work, and being able to explain your logic is far more important than just getting the correct answer.

## Graded Coursework

Grades will be calculated using the following weighting system and scale.

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|---|---|---|---|---|---|---|---|
| Exams | 40% | 93-100 | A | 77-79.9 | C+ | 60 - 62.0 | D- |
| Portfolio | 30% | 90-92.9 | A- | 73-76.9 | C | below 60 | F |
| Article Summaries | 10% | 87-89.9 | B+ | 70-72.9 | C- | | |
| Homework | 10% | 83-86.9 | B | 67-69.9 | D+ | | |
| Presentations | 10% | 80-82.9 | B- | 63-66.9 | D | | |

You may work on homework and portfolio questions with other students in the class. However, you must write-up your own solutions in your own words without copying from outside work. If you are writing up your work while looking at someone else's solution, you are copying, which is academic dishonesty. What you hand in should represent what you know about the question.

The portfolio is a typed collection of proofs you have written and problems you have solved, along with reflection and commentary. The math in the portfolio **must be correct**, and clearly explained using proper mathematical terminology and notation. The material you include in your portfolio represents your best work. Show me the best that you can do.

**Make sure you keep a record of the work you do for the portfolio, and that it is backed up and not just on a USB drive or on a laptop that might cease working. You will need some of this material at the end of our class and for Math 499S.**

Exams may have both an in-class component and an out-of-class component that are to be completed individually. You will be expected to provide an electronic copy of some exam problems.

**Attendance:** I expect you to be in class every day. You are responsible for all material presented in class. If you miss a day, get notes from a classmate.

If there is a required final exam meeting time but not a graded activity for you during the final exam, you are still required to attend. An example might be that other members of the class are finishing up presentations. Missing a required final exam period in this case will result in a 5% reduction in your overall course grade.

**Homework and Reading:** Completing required practice carefully and thoroughly is also a standard for the course. Short homeworks will be assigned, often to be completed by the next class day. These will be graded primarily on completeness, organization and also on **explanations of your final answer**. Occasionally, you will be given longer assignments with more time to complete them. It is expected that your work will be neat, complete, correct and well-explained.

**Academic Integrity:** You are expected to do your own work. While you are welcome to use outside resources and consult with others on all work taken home, you are subject to the requirement that what you hand in should, in fact, represent your own understanding of the material and not work copied or memorized from another source. See my guide to group work and using outside resources,
`http://www.cwu.edu/math/group-work-and-using-outside-resources`, on the web.

All work and exams are expected to be done without any resources except those explicitly authorized by the instructor. Exams and quizzes are not to be discussed with others who may not yet have taken the exam or quiz or within earshot of anyone who may be taking the exam or quiz at a later time.

If a paper or report is assigned, students are expected to conform to academic standards for citing summarized, paraphrased and quoted work used; if you are not sure what this means, please **ask**.

Cheating will result in at minimum a zero on the assignment, quiz or exam. Cheating will be reported to the office of student conduct. Egregious offenses may result in a failing grade for the course and/or more serious consequences as merited by the situation.

**Getting Help:** We've all needed help with something. Working with students on math is one of the best parts of my job. If you find yourself feeling uncertain, wanting a deeper understanding, wanting to get better grades, or struggling to learn and succeed, please ask questions in class, post questions on Canvas, and come see me. I want to answer all your questions thoroughly, even though it may not be possible to answer every question during class itself. Please give me a chance to help. If you can't attend office hours, please send me an email and suggest several times when you are available so we can find a mutually convenient time to meet.

## Secrets for success:

1. Read the book before class and take notes on what you read.
2. Attend class daily and participate willingly, whether it is by asking questions, answering questions, or working with others. Be brave and explain how you are thinking about things even when you aren't certain you are correct.
3. Budget time for homework – CWU expects you to spend 8 hours per week on work outside of **this** class. It can help to have a regular times scheduled when you know you'll work on math.
4. Start on the homework problems as soon as you can.
5. Attempt to work on your math every day or at least every other day. The hardest part is usually getting started. Find a quiet place to work, get your book and notes together. Put away distractions such as your cell phone, TV, or laptop. Then, set a timer for 30 minutes (or 15 if you are having a bad day) and resolve to put your best effort in for at least that length of time.
6. Discussing problems and solutions with peers and using the internet is encouraged, with two caveats.
   - Before you go ask or look for a solution, make an honorable effort to solve the problem on your own. Spend time thinking and strategizing before asking or searching for help.
   - You must write up your understanding of a solution **on your own**. Practice makes perfect! See my guide to group work and using outside resources, `http://www.cwu.edu/math/group-work-and-using-outside-resources`, on the web.
7. As you progress in your university studies and in your career, problems get more and more difficult to solve. You may have to start with easier (possibly unassigned) problems before you are even ready to start to work on an assigned problem. Some problems may take more than an hour to solve. Persistence pays off.
8. Explain what you are doing. Use your words. This will help you to understand the concepts critical to success in the class, and will help you get a higher grade.
9. I am always happy to help you if you are stuck. You will get the most out of my help and the University Math Center if you attempt the problem on your own or with your peers before asking an expert.
10. Do your scratch work before you do a final write-up of your work. What you hand in should be neat and professional and all pages should be stapled together.

**Students with Disabilities:** I am happy to work with students with disabilities. To set up academic adjustments in this class, you should give me or email me a copy of your *Confirmation of Eligibility for Academic Adjustments* from the Disability Support Services Office. **You must also come see me in office hours or make an appointment to come see me as soon as possible so we can discuss how the approved adjustments will be implemented in this class.** Students without this form should contact the Disability Support Services Office, Hogue 126 or ds@cwu.edu or (509) 963-2171. **Testing requests with testing services must be submitted at least 48 hours before an exam is given, or you will have to take the exam with the rest of the class.**

## Important Dates

January 3 – classes begin
January 9 – change of schedule period ends
January 15 – MLK Day, no class
February 1 – Exam 1
February 16 – uncontested withdrawal period deadline
February 19 – President's Day, no class
March 6 – Exam 2
March 9 – Last day of class
March 16 – (Friday) Final Exam (required attendance) noon