

Welcome to Math 330 Discrete Math – Spring 2018

Section 001: 9:00 - 9:50 M-F in Bouillon 102

Section 002: 12:00 - 12:50 M-F in Hertz 104

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Office Hours: M 1:15-1:55; TuWe 1:30 - 3;
Th 1:15-1:55 and by appointment

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 – they are doing their best to present ideas that will be of use to you later. I have enjoyed reading this book; it has a lot of subtle humor woven into the technical information. That said, you may need to use resources such as Khan Academy online in addition to the textbook to learn the material.

This syllabus is subject to modification. Students will be notified of changes in class and on Canvas.

Course Goals: Math 330 is a course in the mathematics behind computer science concepts and applications. Mastery of college algebra is required for success in this course. This course is meant to familiarize you with mathematics foundational to computer science such as the logic rules you learned in Math 260, and math that is used to analyze algorithms, such as recurrence relations and counting arguments, and math in computer science applications, such as applications of graph theory. Understanding why things work, and being able to explain your logic is as or more important than getting the correct answer. Abstract thinking, good writing skills, logic and (un)common sense are required for success.

This course will cover the following topics:

- I. Counting, Cardinality and Combinatorics (Chapter 14)
- II. Recurrence relations (handout, chapter 6)
- III. Induction Proofs (chapter 5, based on chapters 1-4)
- IV. Number Theory (chapter 8)
- V. Graph Theory (chapter 11, 9)
- VI. Networks (chapter 10)

Grades/Exams/Homework

Grades: We will be using Standards Based Grading this quarter in Discrete Math, which means that the course is broken down into standards, or key learning areas, and student's must demonstrate their competency on the standards to get a *C*, *B* or *A* for the course. Students may retest on the standards if their first attempt was not successful.

I have a list of 19 standards on Canvas for this course, with 8 identified as key areas. Standards will be graded with an *A* (4, excellent) or *B* (3, very good) or Not Yet (*NY*, 0) passed. I may, at my discretion, assign a 2 to indicate substantial progress has been made in learning the area.

To get a *C* in the course, a student must pass 9 standards, including all 8 key standards., and obtain a 70% or better score on homework and reading assignments.

To get a *B* in the course, a student must pass 12 standards, including all 8 key standards, with at least 8 evaluated as an *A*, and obtain a 75% or better score on homework and reading assignments.

To get an *A* in the course, a student must pass 15 standards, including all 8 key standards, with at least 11 evaluated as an *A*. Additionally, students must obtain an 85% or better score on homework and reading assignments.

Other grades will be assigned based on this standard as logically as possible.

Because of privacy rights, I do not discuss grades over email or telephone.

Standards Based Grading and Standards Testing: There will be at least two and a half class days during the quarter that are devoted to testing, and testing on required standards will be offered in class as we finish up a unit. On challenging material, students should expect to test during office hours or by appointment. In order to take a test or re-test during office hours, students must let me know a day ahead of time so I can have the evaluation prepared for them. I may also, at my discretion, ask students to show practice or understanding and mastery of homework problems on that material. The **last** opportunities to test are Thursday of the last week of the quarter and, after that, during the final exam period for our class.

- You may retest on a required standard up to 5 times (for a total of 6 tests).
- On an optional standard, you may retest up to 3 times (for a total of 4 tests).
- If you have not passed a standard and must or you wish to pass it, you must retest on a standard at least once a week from the time it is offered until it is passed. If you do not retest for over a week, I will consider your effort to pass it abandoned.
- You may retest on a standard at most once a day or at most two times a week.
- Let me know a day ahead of time with the name of the evaluation you want to take to test or retest on during office hours or by appointment.
- **In order to take a test or retest, you must have been to the class meeting prior to the office hour or provide evidence of an excused absence.**
- In order to take a 3rd or a 5th retest, students must redo and resubmit homework over that standard.
- If you are not successful in a retest on a standard, I recommend you take time to meet with me to go over the questions you missed so that you are better prepared to retest. **I recommend you retest as soon as possible, and continue retesting until you are successful.**
- I do not return tests to students, although I am always happy to go over these with you in office hours.
- You may not retest the same day as you go over solutions to an old test.
- You must maintain a 70% or better on homework and reading assignments to pass the class with a *C*.

Homework and Reading: Completing required practice carefully and thoroughly is also a standard for the course. Many 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 **by the day the homework is due**. Assignments will be graded accordingly.

Reading assignments are to familiarize you not only with material you will be tested on, but also to give you a broader perspective on the interplay between mathematics and computer science. Reading assignments consist of reading a section of material usually from the textbook and providing a summary of what you read or answering a few questions on Canvas.

To pass the course with a *C* or higher, students must acquire at least 70% of the homework and reading points offered. To receive a *B* or *B+*, students must acquire 75% of the offered homework and reading points. To receive an *A*, students must acquire 85% of the offered homework and reading points.

Testing Days: Attendance at the Testing Days is **mandatory**, as it would be for an exam in a regular class. If you have an emergency or illness for one of these days, bring it documentation. Students who are ahead or substantially caught up may request permission ahead of time to miss a testing day and/or arrange to take a standard at another time; permission is granted at the discretion of the instructor. Students who otherwise miss an in-class testing day without documentation will not be permitted to take or retake evaluations in office hours without an excused absence for that testing day until after the next testing day.

On testing days the first evaluations given to a student will be the oldest required evaluations. Once those are complete, students may use the remaining time to test and pass other evaluations.

Students will be given an opportunity in class and by email to let me know what optional evaluations they would like to take during the testing days.

Attendance: Daily attendance is a must for success. A student is tardy if they arrive after class has begun; students who are more than a few minutes late may be marked absent for the day. A student who leaves during the middle of class or who leaves class early may be marked tardy or absent. A tardy is counted as 25% of an absence. Students who are absent more than 8 times over the course of the quarter will be

required to fulfill an additional evaluation to achieve a given grade. If there is any question about borderline grades at the end of a quarter, students with exemplary attendance (no more than 2 missed days and 2 tardies) will be given the benefit of the doubt and given the higher grade.

The attendance policy outlined above includes excused absences. If an excused absence is prolonged, or there are multiple excused absences, they will be handled on a case-by-case basis. Documentation must be provided. Generally excused absences will count as half of an unexcused absence. If you must be out of class for a field trip, court date, work event or other planned event, contact me and provide documentation ahead of time. If you are absence due to illness or emergency, contact me and provide documentation within 2 working days of the absence.

Students are responsible for all material presented in class. If you miss a day, get notes from a classmate. I also often have old notes on Canvas.

One serious consequence of missing class is that you will not be allowed to take any evaluations in the next office hour after the missed class. Exceptions may be made for documented excused absences.

Office Hours and Getting Help: Office hours are scheduled to make sure there is a time that you can come see me because you have questions on course material or have issues that you otherwise want to talk to me about. I welcome your visit, and office hours will be scheduled during the first week of class when I know what will best fit my students' schedules. Keep in mind, it is impossible for me to schedule office hours at a time convenient to everyone, and I encourage you to ask for an appointment if you need one. I also strive to promptly answer questions posted over email or by Canvas message.

We've all needed help with something. Working with students on math and to succeed in school and in their future career is one of the best parts of my job. If you have questions on course material or need to If you find yourself feeling uncertain, wanting a deeper understanding, wanting to get better grades, or struggling to learn and succeed, please take advantage of opportunities to 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, you are welcome to ask questions by email or by Canvas message. If you want an appointment, 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. Productive struggle is your goal – learning anything new isn't easy, but you want to make continual incremental progress.
2. Don't be afraid to make mistakes! When you get something wrong, take time to figure out why it is wrong and why the correct answer is correct. Fix your thinking.
3. Read the book before class and take notes on what you read.
4. Attend class daily and participate willingly, whether it is by asking questions, answering questions, or working with others.
5. Budget time for homework – CWU expects you to spend 10 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.
6. Start on the homework problems as soon as you can.
7. 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.
8. 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), <http://www.cwu.edu/math/group-work-and-using-outside-resources>, on the web.

9. 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.
10. 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.
11. 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.
12. 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.

Academic Integrity: All in-class tests and evaluations taken during office hours are expected to be done without any resources except those explicitly authorized by the instructor. Do not discuss tests with others who may not yet have taken the test yet, or within earshot of someone who may be taking it at a later time. Any work done at home may be discussed with others, but what you hand in should represent your own understanding of the material, and should not be copied from others.

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.

Late and Make-up Policy: Field trips, illnesses, accidents and deaths in the family are a part of life. I will arrange to take late work or for a make-up or alternative if you contact me either ahead of time or within 24 hours and provide documentation.

I expect you to hold yourself to professional standards in this class. Because even professionals sometimes run into conflicts, I will accept **one** late homework assignment and **one** late reading assignment no questions asked, for full credit, provided it is handed in on Canvas within 24 hours of the deadline or handed in to me at the beginning of the next class period. Under special circumstances, you may also get my written (emailed) agreement to hand it in later. Likewise, I will let you resume testing on one abandoned standard (a standard you haven't retested on in over a week) provided it has not been forgotten for 2 weeks or more.

Emailing me with information about absences and late work will help to make sure there's a documentation trail in case I don't remember a verbal conversation.

Students with Disabilities: I am happy to work with students with disabilities. To set up academic adjustments in this class, you should give me a copy of your *Confirmation of Eligibility for Academic Adjustments* from the Disability Support Services Office and 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, dssrecept@cwu.edu, <https://www.cwu.edu/disability-support/>, phone (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

April 2	Last day for Add/Drop	May 28	Memorial Day, no classes
May 4	First in-class testing day	May 31	Last day to test in office hours
May 11	Uncontested withdrawal deadline	June 5	(002) Final exam at noon
May 16-17	SOURCE Days, class as usual	June 7	(001) Final exam at 8 am
May 25	Second in-class testing day		