Concepts of Modern Mathematics II, MATH 1351

Meeting Times: 9:05-10:00 am MWF in RBN 4032

Last day to withdraw: Monday, March 31, 2025

Instructor: Nathan Smith

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Office Hours: Tentatively 11:15-12:10 MWF

Text: no text

Course Topics: Proportional reasoning, geometry, and elementary probability/statistics.

We will be looking down, as adults and prospective educators, at much of the mathematics taught from grades K-8 according to the Texas Essential Knowledge and Skills standards. Being able to "do the math" is not the only skill needed for effective instruction.

What will you do when you explain a concept to a student using the method that is clearest and most obvious to you and the student doesn't understand? Will you repeat what you said in exactly the same words, only louder? What if the student still doesn't understand?

How will you answer a student who asks a question and you don't immediately know the answer? Will you say, "That's not part of this class. You'll learn that in another class."? If so, how will you keep this student engaged, learning and not causing mischief?

Our purpose is to have you look at mathematics from different viewpoints, to see that it can be interpreted and learned in different ways. This will allow you to explain concepts in multiple ways to address the needs of students who think differently from you.

Additionally, this class will train you how to attack problems that you haven't seen before. You will be able to guide students through the process of addressing challenging problems. Your students will learn, by example, from you how to think critically and how to move forward when addressing new material

Student Learning Outcomes: By the end of the course students should be able to:

1. Analyze and solve problems using a variety of algebraic approaches.

2. Recognize the relationship between algebra and geometric problems and use that knowledge to solve them.

3. Know the basic definitions and classification of geometric objects, be able to solve problems using them, and be able to use appropriate units.

4. Know the basics of probability and know how to make basic graphic and numerical data summaries and be able to use and interpret these in a real-world context.

Grading:

- Test1: $\frac{1}{4}$ of your semester grade. (late Feb. sometime)

- Test2: $\frac{1}{4}$ of your semester grade. (mid Apr. sometime)

- Final exam: $\frac{1}{4}$ of your semester grade.

- Quizzes and any etc.: $\frac{1}{4}$ of your semester grade. (every Friday)

Attendance: In order for a student to be successful at meeting the student learning outcomes listed above the student must be present. I will be posting things we do in class on canvas for students who need to miss class to access. Obviously if you are ill with coronavirus or tuberculosis or something you shouldn't be coming to class and we'll need to make accommodations, but I have no intention of broadcasting every class on canvas this semester.

Missed work: There are fourteen weeks in the semester. While we may have a quiz during a test week, let's just pretend not, so that's twelve quizzes during the course of the semester. I will compute your quiz average using your nine highest quiz grades, dropping three. In return for this magnanimous gesture on my part, I won't be giving makeup quizzes this term. I fully expect you to have to go help your Great Aunt Marcie move one Friday, lest you be disowned and miss out on the inheritance, or something like this. Further, I fully expect you to be sick with the bird flu or the swine flu or the monkey pox or the cow pox or the corona virus or maybe just a rip-roaring hangover one Friday and to miss a quiz – life happens. If you want to think of this as "We have ten quizzes and, lucky for me, I got sick on the Friday we didn't have a quiz, and I still get to drop my lowest quiz grade," then that's great, think of it that way. If you want to think of it as "We have twelve quizzes and I get to drop my lowest three, but even if I got kidnapped by space aliens or the CIA or whomever, my greatest excuse of all time still won't be worth a make-up quiz," then that's great too, think of it that way. If you want to think of it as "Well, my top nine quizzes count for my quiz average, but I couldn't have anticipated my Great Aunt Marcie being kidnapped by space aliens and the CIA needing me to help get her back, so I had to miss the quiz, surely this is a worthy exception; look, I've even got a note here signed by Barack Obama, Hillary Clinton, Joe and Jill Biden, Donald Trump, and Elon Musk," then I encourage you to go ahead and drop this class now, your reading comprehension is not at a sufficient level for you to make it through.

If you are on the University Croquet Team or something of that nature and need to miss due to a Universtity sanctioned event, blah, blah, blah, then the University rules about make-ups continue to apply. Please be careful of the CIA and the space aliens nevertheless.

It is not expected that you will miss a test. I will be replacing your lowest test grade with your final exam grade in the event that the final exam grade is higher. If you have to, on a test day, go help the space aliens hide their flying saucer in your Great Aunt Marcie's garage

so that the CIA doesn't catch up with them, then your test grade is a zero. Presumably you'll earn a higher grade than that on the final exam.

Because a fair amount of the learning in this class revolves around discovery learning activities undertaken during class time, attendance is extremely important. And stay off your damn cell phone while in class, you can respond to your Great Aunt Marcie's texts and Instagram Stories after class.

Student Academic Conduct: It is your responsibility to learn the material in this course for your own benefit. You should not let this discourage you from working together on your homework but in the end what you turn in should reflect your understanding, not just be copied from someone else. *During the tests, a code of honor will apply under which students are to work alone and neither give help to others nor receive help from any sources.* Students are also expected to help enforce this code. Students are encouraged to obtain a copy of *A Student Guide to Conduct and Discipline at UT Tyler*, available in the Office of Student Affairs.

Artificial Intelligence: UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course (see below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

For this course, you may not use AI tools to produce anything turned in for a grade.

University Policies: We will follow all University policies concerning Withdrawing from Class, Final Exmas, Incomplete Grades, Grade Appeals, Disability/Accessibility Services, Military Affiliated Students, Academic Honesty and Academic Misconduct, FERPA, Covid, Absences, and Campus Carry. See canvas for details (https://uttyler.instructure.com/courses/34488/pages/university-policies-and-information).

Course Outline

- Unit One - ratio

  - ratio and proportion
  - similar triangles
  - double number lines and ratio tables

- Unit Two - geometry in the coordinate plane

  - distance
  - midpoints
  - circles
  - lines slope
  - parallel and perpendicular lines

- Unit Three - geometry without focusing on coordinates

  - triangles and congruence
  - polygons
  - area and perimeter
  - symmetry - rotations reflections translations
  - dilations
  - three dimensional figures
  - surface area and volume

- Unit Four - probability and statistics

  - probability
  - counting
  - summary statistics