

Geometry

MATH 4507
3 credit hours, online lecture/discussion

Instructor Info

Claire Merriman

Office Hours: TBD

Zoom link provided on Carmen

carmen.osu.edu

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Course Info

Prereq: C- or better in 3345 and in 2568 or 5520H.

Mon, Wed, Fri 11:30a-12:25p, required

Zoom link provided on Carmen

Grading

Participation	20%
Textbook Writeups	60%
Quizzes	5%
Writing and Feedback	5%
Final Project	10%
Total	100%

Grading scale

A	90-100
B	80-89
C	70-79
D	60-69
E	0-59

Overview

This course takes course revisits concepts from high school geometry as they appear in Euclidean, spherical, and hyperbolic geometry. The main goals of the course are to

- understand the difference between neutral, Euclidean, spherical, and hyperbolic geometry
- use calculus and linear algebra techniques to prove facts about Euclidean (flat or "normal") geometry
- use the techniques from Euclidean geometry to study hyperbolic geometry
- View spherical, euclidean, and hyperbolic geometries on a continuum of geometries

The goals of this course format are to:

- increase student confidence in their ability to solve difficult math problems by using previous results, trying different methods, asking questions, and working with others
- increase student confidence in their ability to judge when a solution is "done."

Assignments, quizzes, and grades will be posted on Carmen.

This course is fairly different from how you have probably done mathematics in the past, which makes it difficult. However, the goal is to give you many opportunities to meet these expectations. Much of the work of proving theorems and learning the material is the responsibility of the students, while my job as the instructor is to guide you through that process. You are not expected to already know how to solve these problems. The problems you work on in class and for homework are not a way to show what you know, but rather how you learn the material, which might be a different way of viewing homework than you are used to.

If you are sick or otherwise have to miss class, contact me as soon as possible about making up missed work and turning in assignments.

Material and technology

This course has students "write their own textbook." This means you get a file with definitions and sometimes theorems, then work in class to solve problems and proof other theorems. A copy of the file from last year is available on Carmen now, and updated versions will be posted throughout the semester.

You will need a webcam, microphone, and way to participate in Zoom chat MWF 11:30-12:25. Participation in the breakout room discussions are a significant portion of your grade.

All regular course meeting Zoom main meeting rooms will be recorded, captioned, and uploaded to Carmen after class. Breakout rooms are not recorded.

You will also need a way to submit assignments as PDFs on Gradescope. This may be photos/scans of handwritten work or PDFs of typed work. A list of options is available on Carmen.

Inclusively Statement

I expect this course to be a place where you will be treated with respect. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class. No student should be marginalized in any form for questions or contributions made in class, during office hours, or on Carmen discussion boards. Students should cooperate to help each other's understanding of the mathematical concepts discussed in lecture regardless of their background. Creating or contributing to a hostile environment will result in lost participation points.

Remember that everyone comes to the class with different personal and mathematical backgrounds. If someone has seen some of the course material before, that does not mean everyone has seen it before or that I expect you to already know it.

Discrimination against any individual based on age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status will not be tolerated.

Participation

You can earn up to 3 points per class session for active participation. You must arrive on time and stay for the whole session. Absence or tardiness will result in a lower participation score for the day. However, I acknowledge the online format will make it harder to arrive on time, especially if you have an in-person class at 10:20.

- 10 to 20 minutes late or leave 5 to 15 minute early: 1-2 points maximum.
- More than 20 minutes late, leave more than 15 minutes early, or unexcused absence: 0 points.

The instructor reserves the right to deduct additional points for distracting behavior, creating a hostile group environment, or lack of active participation.

The best way to interact with your group in breakout rooms is with your video and microphones on. Zoom chat is a good backup for audio, although it takes longer and does not show when someone is typing.

If you are unable to attend on a certain day due to illness or technological difficulties, we will work together to determine a plan for making up the work. The lowest 3 scores will be dropped.

Textbook Write-ups

Textbook write-ups are due on the Friday after we finish a chapter. Make sure that you are taking notes as you work on the problems during class. You are encouraged to work together on the problems outside of class; however, you must write up your own solutions and submit them individually.

All write-ups are graded out of 3 for both accuracy of the mathematics and the clarity of the explanation. After the assignment is graded, *you may revise your answers based on the feedback and resubmit for a new grade*. These assignments and the revision process are how you learn mathematics, and you are not supposed to know how to solve these problems before the start of the course.

Each problem will be graded on the following scale, which will then be used to determine the overall assignment grade:

- 0 points Ungradable—missing, blank, illegible, or only wrote down problem or other basic information such as a definition.
- 1 point Does not demonstrate understanding of the material. Significant flaws in mathematical argument or contains unclear explanations that make it difficult to determine mathematical correctness.
- 2 points Demonstrates understanding of the material with some flaws in the mathematical argument or unclear explanations that would make it difficult for another student in the class to understand the argument.
- 3 points Demonstrates understanding of the concept with clear explanations. May include minor errors while still demonstrating understanding of the concepts. Explanations would make sense to a classmate as well as the instructor.

Write-ups will be submitted to and graded on Gradescope ([Links to an external site.](#)), however Gradescope will only show the score for each problem. Ignore Gradescope's overall assignment score.

Each chapter will receive its own score out of 3, except Chapter 2 which is broken into part 1 and part 2. The rubric for each chapter will be on the corresponding assignment grade. For example, if a chapter has five or six problems, the rubric would be:

- 3 points earned a score of 3 on at least three problems and a score of 2 on at least two problems
- 2 points earned a score of 3 on at least one problem and a score of 2 on at least two problems
- 1 point earned at least a 1 on all problems

Since you may resubmit any write-up for a new grade, no scores will be dropped. If you resubmit an assignment, the new grade replaces the old grade.

Quizzes

There will be 1-3 question quizzes on Carmen each Friday, mostly focused on true/false questions. These quizzes are open notes, but have a short (5-10 minute) time frame from when you open the quiz. If you have testing related SLDS accommodations, it is important that you let me know so that I can make the changes in Carmen.

The lowest 2 quiz grades will be dropped. Since the quizzes are mostly true/false, there is no opportunity for corrections.

Writing and Feedback

Part of doing mathematics is learning how to communicate mathematics. This is especially important in a course like this one that focuses on students writing the proofs. Every other week, you will have an assignment designed to improve your writing or teach you to give constructive feedback.

These assignments will also be graded out of 3, with the lowest grade dropped.

Final Project

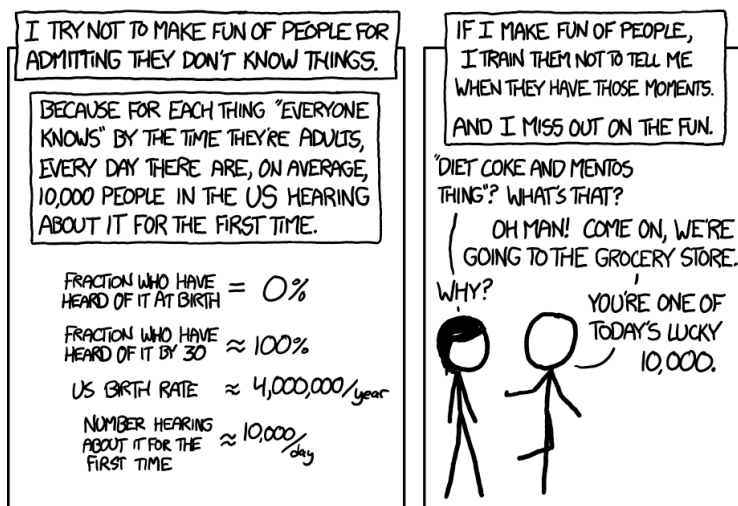
You will have a longer final project on a topic relating to two or three dimensional geometry. The topic and format of the project will be determined by each student and the instructor. While a paper-style final report or a video of a PowerPoint presentation are options, this is also an opportunity for students to choose how best to explore and explain the topic. Especially in an online geometry course, there is no reason to limit to these static, 2D presentation styles.

The first draft is due on November 23 and the final draft is due at the end of exams on December 11.

Group Work

Most of your time in class will be spent working in groups. You are expected to be a helpful and active participant in all group work, as well as allowing the rest of your group to do the same. This means asking and answering questions, as well as working at the same pace as your group. You have not completed a problem until all of your group members understand the solution.

You are at a point in your education where everyone is taking courses in different orders. The topics in this course may also be more or less familiar depending on your calculus, linear algebra, and high school geometry courses. If you have already seen a concept that we cover in class, view this as an opportunity to learn about it from a different perspective and practice explaining math to others.



Office Hours and Carmen Discussion boards

You are highly encouraged to attend office hours and post in the Carmen discussion boards. The office hours link will be available on Carmen.

Office hours are a chance for you to ask questions and to get feedback on course assignments prior to submitting them. In the event you are unable to attend office hours, you may request an appointment.

Carmen discussion boards allow you to ask questions outside of class and office hours, as well as get feedback from your classmates.

I will respond to discussion board posts and emails within 24 hours on weekdays.

Technological Difficulties

I expect that all students will run into some sort of technological difficulties throughout the semester. All students get 3 late passes that allow them to turn in a textbook write-up up to 24 hours late for any reason.

Note that Gradescope does mark if your assignment is even a minute late, but I will generally be more flexible with the timestamp. Please do not make a habit of turning in assignments at 1 am.

If you know that you have an unreliable internet connection or laptop/tablet, we can make arrangements similar to SLDS deadline modifications. These arrangements need to be made ahead of time and do not exempt you from group work.

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24x7.

- Self-Service and Chat support: <http://ocio.osu.edu/selfservice>

- Phone:614-688-HELP (4357)
- Email: 8help@osu.edu
- TDD:614-688-8743

Academic Integrity

Your textbook write-ups will be submitted individually. Though you may discuss your solutions with any of your classmates, you are expected to write your final submissions on your own. Any copying of work which is not your own is an academic integrity violation. In addition, allowing others to copy your work (in person or by making it available electronically) is an academic integrity violation. If you work on a problem with a classmate (in or out of class) you should acknowledge this collaboration by making a statement of the form “For this problem, I collaborated with . . .”.

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

Make-up Policy

If you know ahead of time that you need to miss a class, let me know as soon as possible. The plan for making up work will depend on the assignment and the reason you missed class. Late assignments will be handled on a case-by-case basis. You can make up participation for excused absences such as illness, family emergency, or technological difficulties. If you are unsure about whether an absence is excused, talk to me.

Even though this course is entirely online, you may not be able to focus on school work if you are sick, so the in-person policies still apply.

- If you are sick, stay home. You can use your own judgement about whether or not you should make a doctor’s appointment or contact Student Health Services. The Advice Nurses are at 614-292-4321. If the nurses or a doctor tells you not to go to class, do not come to class.
- For one or two classes, you can email me before class about making up class participation. If you email me before the missed class, I will grant an extension until you are able to return to class. If you are sick enough to miss more than two classes, you can call the Advice Nurses or make an appointment with a doctor. Student Health Services discourages office visits for illnesses that do not require in-person medical care, so I will defer to them.
- You are also encouraged to come to Zoom office hours or post in the discussion forums with questions. The deadline for the make-up material will depend on how many classes you miss.

If you are dealing with longer term illnesses or other life events that are interfering with your ability to attend class, reach out to me about how to handle assignments and attendance.

Mental Health Statement

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student’s ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life’s Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766.

CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Accommodations for Students with Disabilities

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.