

Information Sheet for Math 360

Course: Math 360, Introduction to Modern Geometry, Spring 2021

Time: Tues/Thurs 11:00–12:15 online

Instructor: Professor Cleary

Tentative Office Hours: Tues 10am–10:50, Thurs 4pm–4:30 and by appointment. Check my webpage for the latest information about office hours.

Text: Stahl, **A Gateway to Modern Geometry: The Poincare Half-Plane**, Jones and Bartlett Publishing, 2nd edition.

ISBN: 978-0763753818, list price \$279, currently \$198 new at Amazon, less used and elsewhere, on library reserve, available “for rent” for the term for about \$30 currently.

Additional text: E. Abbot Abbot, *Flatland*, free, Project Gutenberg version, see webpage.

Additional text: Euclid, *The Elements*, free, many places, see webpage.

Prerequisite: a thorough knowledge of the topics of calculus from 201, 202/212 and 203/213 and 308 or departmental permission

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Website: <https://profcleary.github.io/math360/>

The grading of your work during the semester will be as follows:

- **Homework: (20%)**
- **Participation/Quizzes: (25%)**
- **Oral and Written Exams: (25%)**
- **Final Exam: (30%)**

General Expectations: For each class hour spent in classroom lecture, I expect at least two hours spent outside of class reading and understanding notes from lecture, reading the book, and working on the homework. Math 360 is a difficult class not only because the topics are challenging, but also because there are topics connected to many different things. Furthermore, some of the topics are considerably more abstract than the topics in earlier courses and it will take more work and energy to understand them competently. I expect all students to attend all classes and attempt all the homework assignments.

Exam Policy: There are **no** make-up exams. If you are going to miss an exam, it is your obligation to let me know as soon as reasonably possible beforehand. On the exams, it will be your obligation to demonstrate that you know how to solve the problems. The exams will consist of some problems similar to the homework and also some more difficult ones that will require some creativity to solve completely and efficiently. I will not expect every student to answer every question completely correctly, but I do expect students to know the material well enough to make reasonable progress even on difficult problems.

Important Note on Assessment On-line: There will be oral exams during the term and as part of the final exam. For these, students will be expected to fluidly answer, in an

interactive video exchange, questions from the course similar to those done on the homework and exams. Students who decline to take oral exams or whose submitted work is judged not to be their own work will not pass the course.

Homework Policy: Homework will be assigned in lecture each week and will be posted on the website for this class. The first homework will be collected on the Thursday of the first week. Homework will be due before the beginning of class. I expect students to arrive on time and turn in their homework before the beginning of class. Late homework will not be accepted. Because of this policy, the lowest two homework scores will not count. Since it is not feasible to grade all of the assigned homework problems, only a select few problems will be graded on each assignment. Your homework should be neatly organized and submitted online as a PDF or image file of sufficient definition to see your work readily.

General Advice: This class will require a great deal of time because we will cover many topics over the course of the semester. Lectures, homework, and quizzes will be an essential part of this class. If you do not have adequate time to devote to this class, please consider postponing this class until a semester in which you will have sufficient time. Remember the words of Dostoyevsky: “Originality and a feeling of one’s own dignity are achieved only through work and struggle.”

Academic Honesty: All work submitted for this course should be your own unless explicitly stated or acknowledged by you. If you collaborate with other students on the homework or use reference materials other than the texts, you must acknowledge the help. If you work with other students on the homework you must mention their names and how they helped. If you consult online materials, you must describe those materials and how they were used. If you find that you are not able to do the homework without consulting other students, you will have great difficulty on the exams, quizzes and with the participation components of the course. You are permitted to work with other students in the class, but this permission only applies to cooperative work, not to work mainly done by one student and mostly copied by another. All violations will be pursued through the appropriate campus mechanisms.

Course Learning Outcomes

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| 1. prove properties of lines, angles, and circles from the Euclidean axioms | a,c,e1,e2,f,g |
| 2. prove properties of lines, angles and circles in non-Euclidean geometry | a,c,e1,e2,f,g |
| 3. describe the logical consistency of geometries using models | e1,e2,f,g |
| 4. use mathematical software to model geometric relationships | a,d |

Course assessment tools

1. homework assignments, quizzes, participation
2. in-class exams
3. final exam

Departmental aims:

The mathematics department, in its varied courses, aims to teach students to:

- a. perform numeric and symbolic computations
- b. construct and apply symbolic and graphical representations of functions
- c. model real-life problems mathematically
- d use technology appropriately to analyze mathematical problems
- e. state (e1) and apply (e2) mathematical denitions and theorems
- f. prove fundamental theorems
- g. construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.