Information Sheet for Math 360

Course: Math 360, Introduction to Modern Geometry, Spring 2026
Time: Tues/Thurs 9:30-10:45 in NAC 1511E
Instructor: Professor Cleary
Office: Marshak 301 **Phone**: 650-5122
Tentative Office Hours: Tue 8:30am, 2pm 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
Additional text: E. Abbot Abbot, *Flatland*, free, Project Gutenberg version, see webpage.
Additional text: Euclid, *The Elements*, free, many places, see webpage.
Sections Covered: Chapters 1-8,11 of Stahl
Topics Covered: Axiom systems and models, Euclidean geometry, Euclidean motions, inversions, the hyperbolic plane, hyperbolic triangles and area, the independence of the parallel postulate, spherical geometry.
Prerequisite: a thorough knowledge of the topics of calculus from 201, 212 and 213, and 308 or departmental permission
Email: `scleary@ccny.cuny.edu`
Main Website: `https://profcleary.github.io/math360`

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

- **Homework (15%)**
- **Participation/Quizzes (15%)**
- **Exam 1: (15%):** Thurs, Mar 5th
- **Exam 2: (20%):** Thurs, Apr 16th
- **Final Exam: (35%):** Tuesday, May 26th, 8am–10:15am

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 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: All exams are closed book unless specifically permitted otherwise. Notes, phones, calculators and books will not be allowed. Campus photo ID will be required at

all exams. 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.

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 Tuesday of the second week. Homework will be collected at the beginning of class. I expect students to arrive on time and turn in their homework at 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 stapled and clearly labelled with your name, the assignment number, 'Math 360', and "Dr. Cleary".

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 explictly 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. There is nothing bad about this, but if you work with other students on the homework you must mention their names and how they helped. 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.

Electronic and other assistance: Generative AI systems (ChatGPT, Claude, Gemini, Copilot, etc.), online and computational tools such as Mathematica, Wolfram Alpha, and MATLAB, online problems solution banks, online answer forums, and tutors may not be used for any submitted work unless explicitly announced in advance as permissible. In that case, such use much be acknowledged and documented. Assignments, exams and quizzes in the course are designed to be done by pencil and paper without supplemental materials.

Course Learning Outcomes

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 definitions and theorems
f. prove fundamental theorems
g. construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.