Math 465: Foundations of Geometry
Math 584: Euclidean and Non-Euclidean Geometry
Fall 2019

Marcin Mazur
Office: WH 113 or WH 122
Office Phone: 7-6540
E-mail: mazur@math.binghamton.edu
Course web page: www.math.binghamton.edu/mazur/teach/46519/46519.html

Office Hours: M 2-3, W 2-3. Also by appointment.

Textbook:
Geometry: Euclid and Beyond, by Robin Hartshorne.

Course content: The objective of this course is to present a solid axiomatic foundation for geometry. The course will start with discussion of Euclid's *Elements*. Hilbert's axiomatization of geometry will be introduced and various models of the axioms will be discussed. Although the mathematical prerequisites for the course are few, there will be many proofs done in class, and you will also need to prove results on your own in the homework and provide (simpler) proofs on exams. Additional topics (not covered in the book) may be discussed in class.

Learning objectives:

- Learn basic results from Euclidean geometry of the plane (including the first 4 chapters of Euclid's "Elements")
- Understand the axiomatic foundation of geometry (and the need for it).
- Understand the concept of a model for a set of axioms.
- Learn the construction of non-euclidean geometry (hyperbolic plane) using properties of inversions.

Homework and Classwork: Homework will be collected regularly. Assignments and corresponding due dates will be posted on the course web page. Solutions will be collected and graded.

Tests: There will be one test and a comprehensive final exam. **No make-up tests.**
Date of the test: Wednesday, October 23.
Date of the final exam: Monday, December 9, 12:50 PM - 2:50 PM, in CW 107.

Grading Policy: Grades will be based on a combination of homework, classwork, the test, and the final as follows: homework and classwork 30%, test 30%, final 40%.

Academic Honesty: All students are expected to adhere to the Student Academic Honesty Code.

This course is a 4-credit course, which means that students are expected to do at least 12.5 hours of course-related work or activity each week during the semester. This includes scheduled class meeting times as well as time spent completing assigned readings, studying for tests and examinations, participating in lab sessions, preparing written assignments, and other course-related tasks

Final Remarks: You are responsible for attending class, behaving in class, taking class notes, doing homework problems, asking for and coming in for help, etc.; in the end, you are responsible for your success in this class so work hard! Late arrivals, early departures, cell phone conversations, eating, or drinking are not appropriate. It is your responsibility to keep informed of all announcements, syllabus adjustments, or policy changes made during scheduled classes. **Both class attendance and systematic work on the homework problems are crucial for the success in this class.**

All the above information is tentative. I reserve the right to make reasonable changes if I find it necessary.