

MATH 402 Non-Euclidean Geometry

Fall 2016

Instructor: Vesna Stojanoska
(and Emily Cliff)

Lectures: X13 MWF 12pm 143 Altgeld Hall
F13 MWF 2pm 243 Altgeld Hall

Availability:

- *Office Hours:* Mondays and Wednesdays 3:00-3:50pm, or by appointment, in 323 Illini Hall
- *Email:* vesna AT illinois.edu

Official course description: Historical development of geometry; includes tacit assumptions made by Euclid; the discovery of non-Euclidean geometries; geometry as a mathematical structure; and an axiomatic development of plane geometry.

Prerequisites: MATH 241; MATH 347 or MATH 348, or equivalent; or consent of instructor.

Textbook: Geometry (with Geometry Explorer), Michael Hvidsten

This book is out of print, but the author has generously made an electronic copy available for personal use. It can be found at <http://new.math.uiuc.edu/public402/Hvidsten.pdf>. You could also try to purchase a used copy.

Software: Geometry Explorer.

Download from <http://homepages.gac.edu/~hvidsten/gex/download-3.0.html>.

Grading scheme:

Project reports	15%
Homework	10%
Midterm exams	3 x 15%
Final exam	30%

PLEASE READ THE FOLLOWING important information:

- **Reading assignments** for each class will be announced ahead of time, these should be *completed before class*, and re-read after class as many times as necessary. Reading and learning mathematics is a slow process and requires a lot of reflection. Here are some hints:
 - When reading a proof, close the book often and try to work out an argument independently. This can be done before as well as after reading the argument from the book.
 - Discuss with others. Your classmates are a great choice as they'll have thought about the material as well, but sometimes just the fact of expressing your ideas out loud helps to shape and improve them.

- One class a week, usually on Friday, will be devoted to group work. You will be given *worksheets* of problems, which you will solve in teams of 3-4 students. To get the most out of this activity, it is extremely important to come to class prepared, i.e. have the reading assignments absorbed.
- Almost every week a *project* will be assigned, a *report* for which needs to be turned in the following Monday in class. You will be asked to perform some experimentation with a mathematical phenomenon using the Geometry Explorer software. Moreover, you will supplement that with formal reasoning in order to understand the patterns or mathematical laws behind said phenomenon. The assignment will be to write a report on what you have learned and how. In general, the reports should contain about a page of essay-style discussion, in addition to any formal mathematical exercises.
- **Homework** will be assigned weekly, due every Friday in class. These will be problems to be solved in a formal mathematical way, and the correctness of the argument will matter.

Crucial: You are strongly encouraged to discuss homework problems and project reports with your classmates. However, you must write the assignment on *your own*. This does not mean simply the physical act of writing, but that the write-up should be done independently without assistance from any sources (including people). Your submitted paper should include the names of your collaborators (or discussion buddies), as well as all sources consulted.
- **Participation:** Everyone is expected to be an active class participant. I will not take attendance, but I will notice frequent absentees.
- **Midterm exams** will be on the following dates, during class time:
 - Exam 1: Friday September 30
 - Exam 2: Friday October 28
 - Exam 3: Wednesday November 30
- **The final exam** will be comprehensive. Time and date will be announced as soon as they are known.
- **Office hours** are your chance to learn from the instructor in an informal setting. To best profit from them, come prepared with questions.