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- Classes:** MWF 10:30–11:20
Johnson 026
- Web site:** www.math.washington.edu/~lee/Courses/444-2006
(or from the Math Department home page,
Undergraduate Program → **Class Web Pages** → **Math 444**)
- Textbooks:** *These are (or soon will be) on reserve in the Math Research Library (PDL C-306).*
Gerard A. Venema, *The Foundations of Geometry*, Pearson Prentice Hall, 2005
Dana Densmore (ed.), *Euclid's Elements*, Green Lion Press, 2002
Harold Jacobs, *Geometry: Seeing, Doing, Understanding*, W. H. Freeman, 2003
- Prerequisites:** Grades of 2.0 or higher in Math 126 and Math 308, or equivalent.
- Exams:** Midterm: to be announced
Final: Monday, Dec 11, 8:30-10:20am, Johnson 026

GENERAL DESCRIPTION

This course is designed for people who expect to be teaching geometry at the high school or middle school level, but it can be useful for many others as well.

Geometry is the first branch of mathematics that humans managed to systematize and place on a rigorous footing, and it has served as a model for rigorous logical thought for more than two millennia.

In this course, my goal is to help you acquire a deep understanding and appreciation for geometry, and learn to think about it more mathematically. I *won't* be teaching you “how to teach geometry”; that’s something you’ll have to learn from education courses and hands-on practice. But in order to be a successful teacher, you need to have what the experts call “profound understanding of elementary mathematics,” or PUFM. In this course, most of the mathematical topics we discuss will be rather elementary, but our approach will be far from elementary.

The main topics in the course will be: comparing intuitive, graphical, verbal, technological, and axiomatic ways of understanding geometry; a survey of the most important results of Euclidean geometry; introduction to and comparison of different axiom systems for geometry; techniques for geometric problem solving; critical reading of Euclid; critical reading of a high-school geometry text; non-Euclidean geometries.

REQUIREMENTS

Reading

Most weeks, you’ll be given a reading assignment from one or more of the three required books. These will usually correspond to the material that will be discussed in the upcoming classes. I will expect you to read through the assignment quickly before the relevant classes, and then to reread it carefully after it is covered in class. There will also be a few handouts to read during the course of the quarter. All reading assignments are required.

Classes

Although I won't officially take attendance, I expect you to attend all classes. In addition to conducting lectures, discussions, and practice exercises designed to clarify the reading and prepare you for the homework, I will also be introducing new concepts that are not covered in either the textbooks or the handouts. If you will miss a class for a religious holiday, let me know in advance and I'll arrange to get you a summary of lecture and any materials that you missed. If you must miss a class for some other unavoidable reason, it's your responsibility to find someone who takes careful and complete notes, and arrange to get a copy of them.

Reading Reports

Each week, you're required to submit a short reading report to the EPost discussion group for this course. (Follow the link on the class web page.) Your report must include at least two paragraphs:

- Briefly describe the most important idea(s) in this week's reading assignment, in your judgment.
- List one or two questions that the reading raised in your mind.

Your questions might address such issues as why something is defined the way it is, how a given concept might be of use, something you'd like to learn more about, how one might present it in a high school class, or something that made you feel "stuck." You may respond (respectfully!) to other students' postings if you wish. In these reports, *there is no such thing as a stupid question!*

Your report may also include any other comments or questions you'd like to raise concerning the course, including the lectures, classwork, reading, homework, or exams. If you wish to write about specific homework problems, please confine your comments to general questions and suggestions about how to get started.

The due date for each reading report will be announced with the homework assignment. Part of your grade will be based on the reading reports. (The only thing that will be graded is whether you've submitted them; as long as you make a good-faith effort to include the two items mentioned above, the content of your reports won't affect your grade.) You may skip at most two weeks to get full credit.

Homework Assignments

Each week, there will be a written homework assignment to turn in for a grade. Each assignment and its due date will be announced in class and posted on the class website. After the first couple of weeks, we will probably settle into a regular weekly homework day. Late homework will not be accepted except in extraordinary circumstances and with advance permission.

I encourage you to work in groups on the homework problems (it's usually the best and fastest way to learn). However, when you write up your solutions to hand in, *you must write your own solutions in your own words*. More details about homework will be given in an upcoming handout.

Writing Portfolios

Some of your written homework problems will be designated as "Portfolio Problems," usually after they've been graded and returned to you. You'll revise and rewrite the solutions to the portfolio problems, often with feedback from other members of the class, the TA, and/or me. After a couple of rounds of revision, you'll come up with a single final version to keep in your portfolio. At the end of the quarter, you'll turn in a completed writing portfolio for a grade.

GRADES

Your grade will be based on a weighted average of the following scores.

- 30% Homework assignments
- 5% Reading reports
- 15% Writing portfolio
- 20% Midterm exam
- 30% Final exam

Individual homework scores will be recorded as percentages, and the lowest homework score will be dropped before averaging the rest.