

## ADVANCED GEOMETRY 11:00-11:50AM MWF SPRING 2013 SH309

- Instructor: Jonathan White
- E-Mail: JWhite@Coe.Edu
- Web Page: <http://public.coe.edu/~jwhite/>
- Office: Stuart 316
- Office Hours: MWF 9:30-10:50am and by appointment
- Office Phone: 399-8280
- Home Phone: 362-3350 (between 7am and 10pm)
- Text: The main text will be *Foundations of Geometry, Second Edition*, by Gerard A. Venema.
- Problem Sets: There will be several problem sets through the semester. Together these will be worth 100 points.
- Participation: Since in-class interactions and activities will constitute such a significant part of this class, attendance and full participation will be represented by 100 points. Absences will generally cost 10 points each, and significantly late arrival or other inattention will cost 5 points each.
- Projects: Students will undertake three major projects during the semester, most of which will include a paper of at least 3-5 page length. Topics will be selected in consultation with the instructor, and there will be considerable freedom to fit individual interests within the scope of the class. These projects will be worth 100 points each, and can be revised for more credit where appropriate. At least one project must be completed by the end of the sixth week and a second by the end of the tenth week of the term.
- Math Culture Points: Up to 50 Math Culture Points may be earned by participating in various activities outside of class, as detailed on page 3 of this syllabus.
- Examlets: There will be three small in-class examlets administered during class time. The dates of these are indicated in the schedule on the back side of this sheet. These examlets will be worth 50 points each.
- The final exam will be held during finals week at the date and time indicated on the back side of this sheet. The final will be worth 100 points.
- Grading: Grading will approximately follow a [92.0%,  $\infty$ )  $\rightarrow$  A, [90%, 92%)  $\rightarrow$  A-, [87%, 90%)  $\rightarrow$  B+, [82%, 87%)  $\rightarrow$  B, [80%, 82%)  $\rightarrow$  B-, [77%, 80%)  $\rightarrow$  C+, [72%, 77%)  $\rightarrow$  C, [70%, 72%)  $\rightarrow$  C-, [67%, 70%)  $\rightarrow$  D+, [62%, 67%)  $\rightarrow$  D, [60%, 62%)  $\rightarrow$  D-, ( $-\infty$ , 60%)  $\rightarrow$  F scale.
- Makeups: For the sake of fairness to those who follow the schedule, makeups for examlets will be allowed only under extenuating circumstances, with documentation and advance notice when humanly possible. Late problem sets will generally not be accepted, and if accepted due to extenuating circumstances will generally be subject to a penalty of 20% of the possible points for each day past due.

This class is intended to serve a variety of different goals. It certainly is intended to provide deep knowledge of elementary geometry for future teachers, but it also should be a valuable course for pure math majors and others curious about the subject. In order to serve those various groups well, several aspects of the class will be individualizable, particularly the projects. I hope you will make the most of the opportunities this presents.

The format of this course will generally be more collaborative, exploratory, and discussion-based than a traditional lecture-based class. This can only be successful if all students come to class well-prepared, so please hold up your part. Remember that I'm around to help.

## Tentative Schedule

Monday 1/14 Chapter 1 – Euclid’s <i>Elements</i>	Wednesday 1/16 §2.1 & § 2.2 Axiomatics	Friday 1/18 §2.3 & §2.4 Postulates
Monday 1/21 <b>No Class – MLK Day</b>	Wednesday 1/23 §2.5 & § 2.6 Theorems	Friday 1/25 §3.1 Starting & §3.2 Distance
Monday 1/28 §3.3 Separation	Wednesday 1/30 §3.4 Angles	Friday 2/1 §3.5 Crossbars and Linear Pairs
Monday 2/4 §3.6 SAS	Wednesday 2/6 §3.7 Parallels and Models	Friday 2/8 Review
Monday 2/11 <b>Examlet 1</b>	Wednesday 2/13 §4.1 Exterior Angles	Friday 2/15 §4.2 Triangle Congruence
Monday 2/18 §4.3 Triangle Inequalities	Wednesday 2/20 §4.4 Alternate Interior Angles	Friday 2/22 – Project 1 Due §4.5 Saccheri-Legendre
Monday 2/25 §4.6 Quadrilaterals	Wednesday 2/27 §4.7 Alternate Parallel Postulates	Friday 3/1 § 4.8 Rectangles & Defect
Spring Break		
Monday 3/11 §4.9 Universal Hyperbolic	Wednesday 3/13 <b>Examlet 2</b>	Friday 3/15 §5.1 Euclidean Basics
Monday 3/18 §5.2 Parallel Projection	Wednesday 3/20 §5.3 Similarity	Friday 3/22 §5.4 The Pythagorean Theorem
Monday 3/25 §5.5 Trigonometry	Wednesday 3/27 §5.6 Exploring Triangles	Friday 3/29 – Project 2 Due §6.1 Hyperbolic Basics
Monday 4/1 §6.2 Common Perpendiculars	Wednesday 4/3 §6.3 Angle of Parallelism	Friday 4/5 §7.1 Neutral Area Postulate
Monday 4/8 §7.2 Euclidean Area	Wednesday 4/10 §7.3 Dissection Theory	Friday 4/12 <b>Examlet 3</b>
Monday 4/15 §8.1 Neutral Circles	Wednesday 4/17 §8.2 Neutral Triangles	Friday 4/19 §8.3 Euclidean Circles
Monday 4/22 §9.1 Constructions	Wednesday 4/24 §10.1 Isometries	Friday 4/26 §10.2 Rotations, Translations, Glide Reflections
Monday 4/29 §10.3 Classification	Wednesday 5/1 Review	
Final Exam – 11am on Saturday 5/4		

Any students with disabilities which might affect their performance in this class should contact me as soon as possible to arrange accommodations.

Coe’s faculty has adopted an academic integrity policy. It is your responsibility to understand and follow it.

Diversity, in all its forms, is valuable.

## Math Culture Points

A significant portion of the grade for this course will take the form of Math Culture Points. These will be earned through activities outside of class including, but not necessarily limited to, those listed below. Note that none of these is mandatory – there are more than enough opportunities than necessary to earn full credit. You should be able to select activities the are particularly relevant to you.

Activity	Points	Max #
Colloquium Attendance	5	–
Colloquium Presentation	5-15	2
Meeting Attendance		2
Nebraska Conference for Undergraduate Women in Mathematics (January 25 – 27)	15	
Iowa Council of Teachers of Mathematics (February 15)	10	
SIGCSE Technical Symposium (March 6 – 9)	10	
University of Iowa Computing Conference (early March?)	10	
Midwest Undergraduate Mathematics Symposium (April 12 – 13)	10-15	
Mathematics Competition Participation	10	2
Mathematical Contest in Modeling (January 31 – February 4)		
Iowa Collegiate Mathematics Competition (February 23)		
Math Culture Reading	5	
Some weeks specific readings will be posted on the course web page		–
Articles from <i>Math Horizons</i>		5
With approval, columns on maa.org, articles from <i>Math. Magazine</i> , <i>The College Math. Journal</i> , etc.		5
Math Club Activities (when appropriate)	5	5
Winter break book, movies, Pi Day celebration, speakers, etc.		
Volunteer Math Outreach	5	3
Working with students at McKinley Middle School, etc.		
Other Appropriate Coe Activities		
Contemporary Issues Forum	5	–
Attending a quantitative Research Symposium presentation	5	3
Job Shadowing in any relevant field	10	2

Generally Math Culture Points can be earned for at most two activities in any given week, so you should plan to spread your participation throughout the semester. In each case above, credit assumes both full participation and posting a brief summary/response on Moodle. These reflections should generally be between 100 and 300 words, and include both a brief summary and your personal thoughts on the event, and **must be submitted within one week of the event**, or within the specified time window for other activities.

