

Gannon University
Math 226-01, Fall 2008
Geometry
TTh 12:00pm – 1:20pm
Zurn 121

Instructor: Dr. Geoffrey D. Dietz
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Office Hours: MWF 9am–11am or by appointment
Text: **College Geometry Using The Geometer's Sketchpad.** Fenton & Reynolds, 2006.
Web Site: http://www.gannon.edu/faculty_staff/faculty/dietz005/teaching/F08-226.html

1. **Credits and Prerequisites.** Math 226 is worth 3 credits. The prerequisite is Math 222: Discrete Math 1.
2. **Course Content.** Metric and synthetic approaches to Euclidean geometry. Incidence, separation, distance, congruence, similarity, angle, measurement. Geometric transformations of the Euclidean plane: isometries, symmetry groups, similarity, and affine transformations. Axiomatic systems for Euclidean and non-Euclidean geometries. Models of hyperbolic, projective, and finite geometries. We will cover Chapters 1–6, 8, and 9 from the text listed above. You are expected to read the assigned sections before every class and be prepared to answer questions. We may also supplement the text with portions of Euclid's *Elements*, available online at <http://aleph0.clarku.edu/~djoyce/java/elements/elements.html>.
3. **Course Outcomes.** Identify the qualities of synthetic (axiomatic), analytic, and transformational geometry. Restate major results in modern geometry using correct definitions, hypotheses, and conclusions. Propose geometric conjectures based on observations and experimentation. Compose correct and logically valid proofs of geometric theorems. Construct geometric ideas visually using computer software in order to experiment and measure results. Understand the importance of axioms in the development of geometry. State the difference between Euclidean and non-Euclidean geometries and the importance of the Parallel Postulate. Represent a model of hyperbolic geometry using the Poincaré Disk. Understand the connection between algebra and geometry using coordinate systems. Describe the impact of different manners of measurement in geometry. Illustrate how geometric objects can be classified using transformations and symmetry.
4. **Evaluation.** Homework and lab assignments will accompany each chapter. A midterm exam will be held during regular class time, and the date may be subject to change. A project on a topic outside of the text will be assigned as well.

5. **Grading.** Final grades will be based on

A: 90–100 B+: 85–89 B: 80–84 C+: 75–79 C: 70–74 D: 60–69 F: 0–59.

The ranges may be widened at my discretion. The grades are weighted as follows:

Midterm Exam (Tues. 10/14):	20%
Final Exam (Thurs. 12/18 11am–1pm):	30%
Labs:	15%
Homework:	20%
Project:	15%

6. **Attendance.** Attending every class is necessary to maximize your success in this course, especially since many classes will be devoted to completion of lab assignments. Regular attendance of scheduled office hours is also recommended if you have additional questions or concerns about any aspect of the course. You are responsible for obtaining any information missed due to absence.

7. **Excused Absences.** An excused absence from an exam will only be given when the absence is truly unavoidable and beyond your control. If you have advanced warning of a situation that will cause you to miss an exam, you must arrange to take a make-up exam before your absence. An exam missed due to illness must be made up the following day unless excused by a doctor.
8. **Technology.** The course and text rely heavily on the computer software *Geometer's Sketchpad*. While the software is available in our lab classroom, you may also wish to purchase a student copy for less than \$40.
9. **Academic Integrity.** Students are assumed to be familiar with the Academic Integrity Policy found in the current edition of the student handbook. Cheating or dishonesty may result in a failing course grade or even expulsion from the University.
10. **Student Disabilities.** Gannon University is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with me as early in the semester as possible. You must also be registered with The Program for Students with Learning Disabilities prior to receiving accommodations in this course.
11. **Homework and Lab Guidelines.**
 - Graded homework and lab assignments in this course must consist of complete, neatly written solutions to the assigned problems. Print outs from *Geometer's Sketchpad* will often be required and should often be included even if not specifically requested. As this course is proof-based, the quality of your arguments and writing are extremely important.
 - Assignments are due at the beginning of class.
 - Print your name and "Math 226" at the top of the first page.
 - Staple all pages of your homework before submission.
 - Label each problem by section and number. The problems should be written out in the proper order when submitted.
 - Start each problem with a *brief* summary.
 - Discussing the solutions to problems with others is permitted and encouraged. You must, however, turn in your own copy of the homework with your own written solutions. Word-for-word copies constitute academic misconduct.
 - Failure to follow these guidelines may result in the loss of points on assignments.
12. **Project Guidelines.** Each chapter of the text begins with a collection of exploratory lab assignments, continues with a discussion of the topics including theorems and proofs, and concludes with some exercises. You will write your own new chapter containing 2–4 lab experiments, 2–3 pages of discussion connecting the lab problems with the topic and including at least one major theorem with proof, and 3 exercises for further exploration. Topics should be approved before Fall Break, and the completed projects will be due after Thanksgiving Break. Possible topics include: Pascal's Mystic Hexagon, Simson Line, Miquel Point, Gergonne Point, Morley's Theorem, Golden Ratio and Fibonacci Sequence, caroms and pool, constructible numbers, or compass-only constructions.

Math 226-01 Tentative Schedule for Fall 2008

Date	Day	Sect.	Lab	HW
8/28	Th	Chap. 1	1-10	3, 6, 18, 23,
9/2	T		due 9/9	26, 29(a-d)
9/4	Th		due 9/11	
9/9	T	Chap. 2	1-10	15, 24, 25, 29,
9/11	Th		due 9/16	37, 38, 43
9/16	T		due 9/23	
9/18	Th	Chap. 3	1-9	1(a,b), 8, 12,
9/23	T		due 9/25	16, 20, 24(a)
9/25	Th		due 10/2	
9/30	T			
10/2	Th	Chap. 4	1-11	4, 6, 10, 11,
10/7	T		due 10/9	13, 15, 24, 26
10/9	Th		due 10/14	
10/14	T	Midterm Exam		
10/16	Th	Fall Break		
10/21	T	Chap. 5	1-9	2, 4, 6, 7
10/23	Th		due 10/28	9, 11, 12
10/28	T		due 10/30	
10/30	Th	Chap. 6	1-9	1, 5, 6, 9, 11,
11/4	T		due 11/6	14, 16, 24, 27, 30
11/6	Th		due 11/18	
11/11	T		Advising Day	
11/13	Th			
11/18	T	Chap. 8	1-9	1, 2, 3, 5, 9, 10,
11/20	Th		due 11/25	13, 16, 20, 21
11/25	T		due 12/2	
11/27	Th	Thanksgiving		
12/2	T	9.1, 9.2	1-5	3, 5, 8, 9,
12/4	Th		due 12/4	17, 22, 29
12/9	T	9.3, 9.4	6-11	due 12/15
12/11	Th		due 12/11	
12/18	Th	Final Exam, 11:00am – 1:00pm		