Gannon University
Math 226-01, Fall 2014
Geometry
TTh 1:30pm – 2:50pm
Zurn 130

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, 2012.
Web Site:	http://webwork.gannon.edu/dietz005/teaching/F14-226.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 10–11 from the text listed above. You are expected to read the assigned sections before every class and be prepared to answer questions. We will also supplement the text with portions of Euclid's *Elements*, available online at http://aleph0.clarku.edu/~djoyce/java/elements/elements.html.

3. **Course Objectives.**
   - Restate major results in modern geometry using correct definitions, hypotheses, and conclusions.
   - Compose correct and logically valid proofs of geometric theorems.
   - Propose geometric conjectures based on observations and experimentation.
   - Construct geometric ideas visually using computer software in order to experiment and measure results.
   - Identify the qualities of synthetic (axiomatic), analytic, and transformational geometry.
   - Demonstrate an understanding of the importance of axioms in the development of geometry.
   - Demonstrate an understanding of the connection between algebra and geometry using coordinate systems.
   - Demonstrate an understanding of the impact of different manners of measurement in geometry.
   - Illustrate how geometric objects can be classified using transformations and symmetry.
   - 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.

4. **Evaluation.** Homework and lab assignments will accompany each chapter. A project on a topic outside of the text will be assigned as well. A midterm exam will be held during regular class time, and the date may be subject to change. A cumulative final exam will also be given.

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

   A+: 100 A: 93–99 A-: 90–92 B+: 87–89 B: 83–86 B-: 80–82
   C+: 77–79 C: 73–76 C-: 70–72 D: 60–69 F: 0–59.

   The ranges may be widened at my discretion but only in your favor. The grades are weighted as follows:

Midterm Exam (Tues. 10/14):	20%
Final Exam (Tues. 12/16, 11am–1pm):	30%
Labs:	20%
Homework:	20%
Project:	10%

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. Points may be deducted from labs if repeated, unexcused absences occur. 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*. The software is available in our lab classroom and accompanies the textbook purchased from the bookstore.

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. Violating this policy will require the student to file an acknowledgment of the incident and admission of guilt.

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* may 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.
    - Directly copying work from another person, a published solution manual, or an online resource (e.g., `chegg.com`) counts as academic misconduct.
    - Include the names of anyone (other students, tutors, faculty, etc.) who helped you out on any problem.
    - Incorrect or (somewhat) incomplete work may be resubmitted before the next exam for full credit. Only problems with a significant amount of work toward a solution may be submitted for regrading.
    - 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 3–5 exercises for further exploration.

    Topics must be approved before Fall Break. A rough draft is due after Advising Day. The completed projects will be due immediately after Thanksgiving Break.

    Possible topics may 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. Other topics may be used with approval.

Math 226-01 Tentative Schedule for Fall 2014

Date	Day	Sect.	Lab	HW	Project
8/28	Th	Chap. 1	1, 2, 4, 5, 6, 9	4, 7, 15, 16, 20	
9/2	T		due 9/2	due 9/4	
9/4	Th	Chap. 2	1–5, 8–10	4, 5a(Use only SAS in proof),	
9/9	T		due 9/9	12, 16, 25, 30	
				due 9/16	
9/11	Th	Chap. 3	1, 3–8, 10, 11	18, 19, 37, 38, 42	
9/16	T		due 9/18	due 9/23	Choose
9/18	Th				topic
9/23	T	Chap. 4	2, 4, 8	1ab, 11(typo), 15a	by
9/25	Th		due 9/25	due 9/30	10/9
9/30	T	Chap. 5	1–7, 9–11	4, 12, 13a, 14, 15, 16, 25	
10/2	Th		due 10/7	due 10/10	
10/7	T				
10/9	Th	**Review**			
10/14	T	**Midterm Exam**			
10/16	Th	**Fall Break**			
10/21	T	Chap. 6	1–7, 9	2, 4, 7, 9, 10, 14	
10/23	Th		due 10/28	due 10/30	
10/28	T				Rough
10/30	Th	Chap. 8	1–10	1(1,3,4), 5(1,3,4), 8,	draft
11/4	T		due 11/6	18, 19, 25, 29, 34, 37	due
11/6	Th			due 11/18	11/13
11/11	T	**Advising Day**			
11/13	Th	Chap. 8 conclusion			
11/18	T	Chap. 10	1–9	1, 2, 3, 5, 9, 10, 16, 21	
11/20	Th		due 11/25	due 12/2	
11/25	T				Final
11/27	Th	**Thanksgiving**			copy
12/2	T	11 (Part I)	1–5	3, 4(GSP), 8,	due
12/4	Th		due 12/4	16, 17(hint), 25, 26	12/2
12/9	T	11 (part II)	8–11, 13	due 12/16	
12/11	Th		due 12/12		
12/16	T	**Final Exam**, 11am – 1pm			