Topics in Geometry – MTH 402
(2 units)

WF 1:30-2:25 pm in RLC 104

Instructor: Greg Crow, Ph.D.
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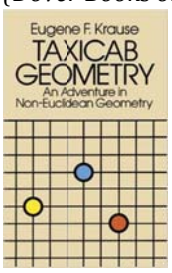
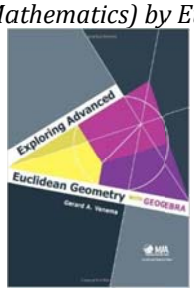
Phone: 619.849.2604
Office: RS220
Office Hours: Posted in Canvas

Texts:
Taxicab Geometry: An Adventure in Non-Euclidean Geometry (Dover Books on Mathematics) by Eugene F. Krause





Exploring Advanced Euclidean Geometry with GeoGebra (Classroom Resource Materials) by Gerard A. Venema

University Mission:
Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Department Mission:
The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

Catalog Description
A study of the foundations of geometry, Affine, non-Euclidean and projective geometries. A synthetic development of advanced Euclidean geometry including geometric transformations, convexity, and constructions.

Learning Outcomes
- Students will be able to demonstrate facility with analytical concepts.
- Students will be able to write proofs.
- Students will be able to apply their mathematical knowledge to solve problems.

Course Format
Mathematics is learned by doing. This course will make use of a geometric computing package (GeoGebra) as a problem solving tool. Thus you will be required to install the software on your own computer and bring it to class during the assigned sessions.

Required Materials
- A straight edge and a compass
- Laptop or access to a computer with Java enabled in the web browser
- Statistical Software (GeoGebra is free to download at https://www.geogebra.org/download).

Grade Components

Grade Components	Percent
Mid-Term Examination	20
Final Exam	35
First Portfolio	15
Second Portfolio	30
Total	100

Homework
The homework is designed to allow you to master the concepts of Geometry; it is not an end in itself. Assignments will be announced on Wednesday and Friday. The work will be submitted as two portfolios. The first portfolio containing the Taxi-Cab problems will be submitted on or before Friday 24-February-2017. The second portfolio containing the problems from Euclidean Geometry will submitted on or before Friday 21-April-2017. The penalty for late work on each of the portfolio submissions will be a $2^{n-1}\times 10\%$ deduction where n = the number of weekdays late. The day counter for late work begins at the start of class on the weekday it is due. For example, a portfolio submitted at 3:30pm on the Monday after the due date will incur a two day late penalty deduction of 20%.

Examinations and the Final Examination:
There will be a Mid-Semester Examination and a comprehensive Final Examination. The Mid-Semester Examination and the Final Examination will include problems and questions over material assigned in the text, readings and handouts, as well as material presented in class. No examination shall be missed without prior consent or a well-documented emergency beyond your control. In such cases, all make-up exams will occur at 8:30 am on the Saturday between classes and Final Exam week. A score of zero will be assigned for an examination that is missed without prior consent or a well-documented emergency beyond your control.

Grading Scale
Grades are based on the number of points accumulated throughout the course with the following exception. A student must pass at least one of the Mid-Term Examination or the Final Examination in order to pass the class. That is, a score of 60% must be achieved on one of the Examinations, or else the final grade will be an F regardless of all other point totals. Approximate minimal percentages required to obtain a given grade are:

Grading Scale in percentages	A	B	C	D
+		(87.5, 90.0)	(77.5, 80.0)	(67.5, 70.0)
	[92.5, 100]	[82.5, 87.5]	[72.5, 77.5]	[62.5, 67.5]
-	[90.0, 92.5)	[80.0, 82.5)	[70.0, 72.5)	[60.0, 62.5)

Attendance:
Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day.

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class_Attendance in the Undergraduate Academic Catalog.

If you miss 10% of the class, you will receive a warning. If you miss 20% of the class, you will be automatically de-enrolled.

Class Enrollment:
It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

Academic Accommodations:
If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See Disability Resource Center for additional information. For more details see the PLNU catalog: http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Accommodations

Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

Academic Honesty:
Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Honesty for definitions of kinds of academic dishonesty and for further policy information.

Copyright Protected Materials
Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

Credit Hour:
In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 2 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

Final Exam: 1:30-4:00 pm on Friday May 5th, 2017
The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.

The Final Exam is a Comprehensive Examination.

Spring 2017

MTH402 Calendar

	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
January	8	9 NSO	10	11 Introduction to a Non-Euclidean Geometry Taxicab Geometry Chapter 1	12	13 Taxicab Geometry Chapter 2	14
	15	16 **MLK Day**	17	18 Taxicab Geometry Chapter 2	19	20 Taxicab Geometry Chapter 3	21
	22	23	24	25 Taxicab Geometry Chapter 3 & 4	26	27 Taxicab Geometry Chapter 4	28
	29	30 **Spiritual**	31	1 Taxicab Geometry Chapter 6 **Renewal**	2	3 Taxicab Geometry Chapter 6 **Week**	4
February	5	6	7	8 Introduction to GeoGebra Venema: Section 1.2	9	10 Venema: Section 1.3	11
	12	13	14	15 Venema: Section 1.4	16	17 Venema: Section 2.2	18
	19	20	21	22 Venema: Section 2.3	23	24 Venema: Section 2.4 First Portfolio Due (Taxicab Geometry Problems)	25
	26	27	28	1 Venema: Section 2.5 Quad II Begins	2	3 **Mid-Term Exam**	4

Spring 2017

MTH402 Calendar

	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
March	5	6 Spring	7	8 Break	9	10 Week	11
	12	13	14	15 Venema: Section 4.1	16	17 Venema: Section 4.2	18
	19	20	21	22 Venema: Section 4.3	23	24 Venema: Section 5.1	25
	26	27	28	29 Venema: Section 5.2	30	31 Venema: Section 5.3	1
April	2	3	4	5 Venema: Section 7.1 & 7.2	6	7 Venema: Section 7.3	8
	9	10	11	12 Venema: Section 8.1	13	14 Easter Recess	15
	16 **Easter**	17	18	19 Venema: Section 13.1 & 13.3	20	21 Venema: Section 14.1 Second Portfolio Due (Euclidean Geometry Problems)	22
	23	24	25	26 Venema: Chapter 14	27	28 Review	29
	30	1	2	3	4	5 **Final Exam** **1:30-4:00 pm**	6 Commencement