

# MATH 3365 – Geometric Systems

## Syllabus and Policies

**Instructor:** Dr. Casey Mann

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**Office Hours:**

8:00 a.m. – 9:50 a.m. M

9:00 a.m. – 9:50 a.m. WF

1:00 p.m. – 1:50 p.m. MW

Other appointments by appointment

**Required Texts:** *Geometry: From Euclid to Knots* by Saul Stahl

### Prerequisites

Math 3425 – Foundations of Mathematics

### Catalog Description of Course

Study of Euclidean and non-Euclidean geometries.

### Dr. Mann's Description of the Course

This course is primarily a study of Euclidean geometry, with an emphasis on the axiomatic system used by Euclid. The theorems that one typically sees in high school concerning congruence and similarity of triangles, facts about circles, lines, and other planar figures are all covered. We will be careful to point out the parts of Euclid's geometry that are dependent upon the parallel postulate (nonneutral geometry) and those that do (neutral geometry) and, time permitting, we will delve into the noneuclidean geometries, including hyperbolic geometry. Time permitting, other topics in geometry may be covered, including some elementary topology.

### Attendance

Attendance for this class is very important to your success. ***Come to class, and be there on time!*** You will be allowed three free absences this semester without penalty. Upon the fourth or fifth absence your semester grade will be lowered one letter grade. That is, if you have an A, then you will get a B. Upon the sixth or seventh absence your semester grade will be lowered two letter grades. Upon the eighth or ninth absence your semester grade will be lowered three letter grades. Upon the tenth absence you will fail the course. Two tardies will equal an absence. For those involved in official university activities, turn in official paperwork to me and those absences will not be held against you.

### Meeting with your professor

You will almost certainly get stuck on problems from time to time, or may not fully grasp a topic from lecture immediately the second you hear it. This is normal and expected; don't be upset! When you have ***genuinely tried*** to work a problem or understand a lecture and are still having difficulties, it may be time to go visit your professor, and you are ***enthusiastically encouraged*** to do so.

### Make-Up Policy

Make-ups for **documented** absences that are ***required*** as part of a UT Tyler obligation (e.g. athletes participating in an event, participating in a debate contest, etc.) will be granted. For all make-ups of this type, prior notification and at least one week and documentation are required. Except for absences resulting from required UT Tyler obligations, make-ups are granted only in the most extreme cases and at the sole discretion of the instructor.

## Grades

Your grade will be calculated using the following percentages.

In-Class Exams	40%
Homework	35%
Final Exam	25%

The grade scale will be as follows:

90% to 100%	=	A
80% to less than 90%	=	B
70% to less than 80%	=	C
60% to less than 70%	=	D
less than 60%	=	F

## Final Exam

The final exam will be given on **Wednesday, May 7, 2:45 p.m. – 4:45 p.m.** The final exam will be comprehensive. Make-ups for the final exam will not be granted lightly. Conflicting work schedules or travel plans will not be considered. For other excuses, see your professor.

## Disability Statement

If you have a disability, including a learning disability, for which you request disability support services and/or accommodation(s), please contact Ida MacDonald in the Disability Support Services office so that the appropriate arrangements may be made. In accordance with federal law, a student requesting disability support services and/or accommodation(s) must provide documentation of his/her disability of his/her disability to the Disability Support Services counselor. For more information, call or visit the Student Services Center located in the University Center, Room 282. The telephone number is 566-7079 (TDD 565-5579). Additional information may also be obtained at the following UT Tyler Web address: <http://www.uttyler.edu/disabilityservices>.

## Social Security Statement

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number.

## Note Regarding Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor by the second class meeting of such absences.

## Grade Replacement

If you are repeating this course for a grade replacement, **you must file an intent to receive grade forgiveness with the registrar by the 12th day of class.** Failure to file an intent to use grade forgiveness will result in both the original and repeated grade being used to calculate your overall grade point average. A student will receive grade forgiveness (grade replacement) for only three (undergraduate student) or two (graduate student) course repeats during his/her career at UT Tyler. (2006-2008 Catalog, p. 35)

## Tentative Course Outline and Schedule

*Disclaimer:* Exam dates (except for the final exam) are likely to change, according on when the material for exams is finished in lecture. This is only meant to give you an approximate idea of the schedule of events.

Jan 14	1.1 – Spherical Geometry
Jan 16	
Jan 18	1.2 – Hyperbolic Geometry
Jan 21	Martin Luther King Jr. Holiday
Jan 23	
Jan 25	1.3 – Other Geometries
Jan 28	
Jan 30	2.2 – Definitions and Postulates of Euclidean Geometry
Feb 1	
Feb 4	Propositions I.1 – I.4 (Neutral Geometry of the Triangle)
Feb 5	Propositions I.5 – I.7 (Neutral Geometry of the Triangle)
Feb 7	Propositions I.8 – I.10 (Neutral Geometry of the Triangle)
Feb 11	Propositions I.11 – I.14 (Neutral Geometry of the Triangle)
Feb 13	Propositions I.15 – I.17 (Neutral Geometry of the Triangle)
Feb 15	Propositions I.18 – I.20 (Neutral Geometry of the Triangle)
Feb 18	Propositions I.18 – I.20 (Neutral Geometry of the Triangle)
Feb 20	Propositions I.21 – I.23 (Neutral Geometry of the Triangle)
Feb 22	Propositions I.26 – I.28 (Neutral Geometry of the Triangle)
Feb 25	
Feb 27	<b>Exam #1</b>
Feb 29	Propositions I.29 – I.32 (Nonneutral Euclidean Geometry)
Mar 3	Propositions I.33 – I.37 (Nonneutral Euclidean Geometry)
Mar 5	Propositions I.38 – I.41 (Nonneutral Euclidean Geometry)
Mar 7	Propositions I.42 – I.45 (Nonneutral Euclidean Geometry)
Mar 10	Spring Break
Mar 12	Spring Break
Mar 14	Spring Break
Mar 17	Propositions I.46 – I.47 (Nonneutral Euclidean Geometry)
Mar 19	Propositions I.33 – I.37 (Nonneutral Euclidean Geometry)
Mar 21	Propositions II.14, V.1, V.12, V.16 – V.18 (Nonneutral Euclidean Geometry) <b>Last day to drop a course with a W</b>
Mar 24	Propositions VI.2, VI.4 – VI.6 (Nonneutral Euclidean Geometry)
Mar 26	
Mar 28	<b>Exam #2</b>
Mar 31	Propositions III.26 – III.29, III.3 (Neutral Geometry of the Circle)
Apr 2	Propositions III.16, III.18, VI.33 (Neutral Geometry of the Circle)
Apr 4	Propositions III.20, III.21, III.31 (Nonneutral Geometry of the Circle)
Apr 7	Propositions III.36, III.37, III.22 (Nonneutral Geometry of the Circle)
Apr 9	Propositions IV.5, IV.4 (Nonneutral Geometry of the Circle)
Apr 11	Propositions IV.15, IV.10, IV.11 (Regular Polygons)
Apr 14	4.4 – Circle Circumference and Area
Apr 16	4.5 – Impossible Constructions
Apr 18	
Apr 21	<b>Exam #3</b>
Apr 23	5.1 – Division of Line Segments
Apr 25	5.2 – The Theorems of Menelaus and Ceva
Apr 28	5.2 – The Theorems of Pappus, Desargues, and Pascal
Apr 30	5.3 – The Projective Plane
May 2	
May 5	Review Day
May 7	<b>Final Exam: 2:45 p.m. – 4:45 p.m.</b>

## Student Learning Objectives

Upon completion of this course, students should be able to do the following:

- Be able to discuss the differences between Euclidean, spherical, hyperbolic, and other noneuclidean geometries.
- Be able to prove geometric theorems.
- Be able to discuss the axiomatic approach to mathematics.
- Be able to make geometric computations involving length and area.
- Be able to discuss the historical significance of Euclidean geometry.