

Course Title: **Introduction to Higher Geometry**  
 Course Number: **MATH 361**  
 Section Number(s): **01**  
 Semester: **Spring**  
 Year: **2014**

### Course Description

(Formerly MATH 311) A survey of axiomatic and modern geometry intended for future middle and high school teachers. Topics covered will include incidence axioms, congruence theorems for triangles, the circle theorems, implications of the fifth postulate, congruence theorems for quadrilaterals, parallelism, similarity, transformational geometry, matrix transformations, and an introduction to spherical and hyperbolic geometry. The course will incorporate the use of Geometers Sketchpad or equivalent software as a tool for verification of conjectures. Offered every other year. Spring. Prerequisites: MATH 213, MATH 215 or MATH 243, MATH 272.

### Class Meeting Times

Lab	2:00-3:15 PM	T	RLC 102
Lecture	2:00-3:15 PM	F	LEO 238

Instructor's Name: **Dr. Tyler Markkanen**  
 Office Location: **RLC 200A**  
 Office Hours: **TBD – See HW 0**  
 Contact Information: **tyler.markkanen@manhattan.edu**  
**(718) 862-7831**

### Required Textbook

Gerard Venema. *Foundations of Geometry, Second Edition*.  
 ISBN-13: 9780136020585

### Subject Material Covered in the Course

We will cover some or all of the sections in each of the following chapters:

- Chapter 1: Prologue: Euclid's *Elements*
- Chapter 2: Axiomatic Systems and Incidence Geometry
- Chapter 3: Axioms of Plane Geometry
- Chapter 4: Neutral Geometry
- Chapter 5: Euclidean Geometry
- Chapter 6: Hyperbolic Geometry
- Chapter 8: Circles
- Chapter 10: Transformations
- Chapter 11: Models

### Outcome Expectations

- Gain experience in writing proofs before attempting more advanced math courses.
- Be more adept and comfortable with mathematical language.
- Understand the mechanics of an axiomatic system, especially when used in geometry.
- Gain an appreciation for the beautiful and foundational theorems of Euclidean geometry.
- Solve and explain problems using the fundamental concepts of Euclidean geometry.

- Understand why Euclid’s fifth postulate (also called his Parallel Postulate) is independent of his other postulates.
- Gain exposure to non-Euclidean geometries like hyperbolic and spherical geometries.
- Solve geometric problems with the aid of interactive software like GeoGebra.

Howework Assignments and Suggested Exercises

- For each chapter of the textbook (except possibly Ch 1), there will be one or more problem sets to hand in. Only about **two or three of the problems from each set will be graded (these will be indicated by a \*)**, but you must also give an honest attempt at the non-graded problems to get full credit for the assignment. Due dates will be announced in class and on Moodle as the semester progresses. **ALL WORK** and steps must be clearly shown. Remember, office hours are a good place to get homework help.
- **HW 0:** Logon to the course website on **Moodle** at <https://lms.manhattan.edu>. Click on the **My Schedule** link. Fill out and submit the schedule form that comes up.  
**HW 0 IS DUE BY SUNDAY 1/26 AT 11:55 PM.**

Dates and Times of Quizzes and Exams

- **QUIZZES:** There will be four announced quizzes. Quizzes will be given **in class**, and the announced quizzes will be on the following Fridays: 2/7, 3/7, **3/14\***, and 4/11. There will be at least one **pop quiz!**  
\*Changed from original syllabus
- **EXAMS:** There will be **three in-class exams** and a **common cumulative final exam**. The dates of the exams are shown below

<u>EXAM</u>	<u>DATE</u>	<u>TIME</u>
Exam 1	<b>Tues 2/25*</b>	In-Class
Exam 2	<b>Tues 4/1*</b>	In-Class
Exam 3	Fri 4/25	In-Class
Final Exam	Mon 5/12	1:30-3:30 PM, Room TBA

\*Changed from original syllabus

Grading Method, Extra Credit Assignments, and Make-Up Policy

- **GRADE:**

<u>Grade Category</u>	<u>Percentage of Final Grade</u>
Class Participation	5%
Homework	20%
Quizzes	10%
Exams (3)	15% (each)
Final Exam	20%

- **EXTRA CREDIT:** There will be occasional extra credit opportunities. Details will be announced as the semester progresses.
- **MAKE-UPS:** Make-up quizzes and exams are generally not allowed unless you tell me **in advance** that you will be absent on a quiz/exam day. After solutions to a quiz have been posted, make-ups for that quiz will not be allowed.

Attendance Policy

You are expected to attend each class. Please come to class prepared and ready to learn. Ask questions and make helpful comments. Be ready to participate in class discussions and activities. If you miss class, you are responsible to get the notes and assignment details from someone in the class,

as well as any handouts. **You must notify me IN ADVANCE if you will be absent on a quiz/exam day.**

#### Expected Academic/Professional Conduct

- All written work must conform to Standard English usage. Failure to meet such standards will affect your grade.
- When placed on your assignments, your name verifies that the work is your own.
- All Manhattan College students are expected to maintain the highest standards of academic and personal integrity. Any violations of academic integrity like exam cheating, facilitation of dishonesty, plagiarism, i.e., copying from any source (e.g., classmates, published sources, and the Internet) for an assignment without proper quotation and citation, will be dealt with in accordance with the student handbook of Manhattan College and will result in disciplinary penalties.
- Find the precise statement of the college's academic honesty policy at: <http://manhattan.edu/community-standards-and-student-code-conduct>.

#### Students with Disabilities

Qualified students with disabilities will be provided reasonable academic accommodations if determined to be eligible by the Specialized Resource Center. Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility from the Specialized Resource Center, which is located at Miguel Hall, Room 301B. It is the student's responsibility to initial contact with the Specialized Resource Center staff and to follow the established procedures for having the accommodation notice sent to the instructor.