Course Information
Math 487: Foundations of Geometry - Section 01, Spring 2018
3 Credits: MWF 11:00 - 11:50am Bridges Room 263

Textbook: *Survey of Geometry*, 1st ed. (online text), by Timothy Peil (http://web.mnstate.edu/peil/geometry)
Instructor: Professor Justin James, Mathematics Department
Office: MacLean 375M
Office Hours: TWTh 10:00 – 10:50am
M W 1:00 – 2:30pm
Other times by appointment
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Course Description: Systems of geometry such as Euclidean, non-Euclidean, coordinate, synthetic, transformational and projective. Models in geometric systems.

Prerequisites: MATH 323, MATH 327, and MATH 311 (or MATH 310)

Major Content Areas:
- Axiomatic Systems
- Finite Geometries
- Euclidean and Non-Euclidean Geometries
- Transformational Geometry
- Projective Geometry

Learning Outcomes (General):
- Understand the components of an axiomatic system.
- Understand the difference between synthetic and metric geometry.
- Be able to determine whether a geometric model satisfies a geometric system.
- Understand neutral geometry and the differences between Euclidean and non Euclidean geometries.
- Be able to use a matrix model to represent and classify transformations of the Euclidean plane.
- Understand the role of the principle of duality in the projective plane.
- Be able to use dynamic geometry software to make constructions that illustrate geometric concepts.
- Construct coherent mathematical proofs

Course Requirements: This class may be a bit different from other math content courses that you have taken. This course will focus on using active learning and an "exploratory" or "inquiry based" model. I plan to minimize the amount of time I spend lecturing on course content to allow more time for you to interact with each other and with course content to build understanding. You will be given activities that will help introduce you to key definitions and theorems. I will give "mini-lectures" on key course content and I will work examples when needed, but the bulk of our time should be spent on in-class activities, discussion, and student presentations. You will also be expected to work in groups write a report and give an in-class presentation on a geometric topic and to be able to carry out geometric constructions using a application such as Geometer's Sketchpad or Geogebra.

Instructional Strategies: group work, discussion, presentations, writing assignments, journals, lecture.

Attendance and Academic Expectations: You are expected to attend class regularly and on time and you are expected to actively contribute to activities and discussion during class time. Since it is difficult to fully re-create a cooperative group outside of class time, it will be difficult to make up missed in-class activities. I will allow you to make these activities up only when your absence is excused. If you are more than a few minutes late to class, I reserve the right to penalize your grade on in-class activities (since your group had to complete a portion of it without you). You are also expected to complete all exams, quizzes, preview activities, writing assignments, and to give well prepared presentations as outlined below.

Activities: A significant portion of your course grade will be based on successful completion of activities designed to help you learn and practice applying concepts from the course. These activities are designed to introduce key definitions and concepts and to help you explore and develop an understanding of course content. My goal is to teach this class using an "inquiry based" approach -- I will spend less time lecturing on course content to allow more time for you to build understanding by interacting with each other and with course content through these activities. Activities will sometimes be collected at the end of class, or I may allow you to take them home and complete by the beginning of class at our next class session.

Journals and Writing Assignments: At various times throughout the course, I will assign short, informal writing assignments. Some of these you will complete during class time. Others you will complete outside of class time. You should purchase and use a spiral notebook, composition notebook, or a *small* 3-ring binder that you can use to house these writing assignments. I will expect you to revisit some of your previous writing later in the course, so you should keep all of your writing in one place. I will collect and grade your "journals" periodically, but not necessarily after every individual assignment.

Homework: I will collect homework for grading approximately once each week. You will be told ***at least*** one class meeting in advance which problems to write up. You are encouraged to discuss homework with your classmates (and with me) outside of class during my office hours. Unless an assignment is a group assignment, the final product that you submit should represent your own intellectual efforts. If you make significant use of other resources (print, online, classmates, friends, tutors, etc.), you should clearly cite these in your write-up.

Quizzes: I will occasionally give quizzes during the course. I usually announce quizzes in advance so you have time to prepare for them. Quizzes will be worth from 5-10 points, depending on their length and scope. Quizzes may be given individually or as "group quizzes"; some may be administered **online** through the course D2L site.

Exams: This course will have three chapter exams plus a final exam, as outlined on the course schedule. Be sure to mark the date of each exam on your calendar, especially the final exam. Each exam (including the final exam) will have an "in-class portion" (this will be closed book, closed notes) and a "take home" portion. Since Chapter 1 is quite short, the Chapter 1 exam is worth 60 points. The other chapter exams are worth 100 points. Half of the final exam is on Chapter 4 material. The remainder is a comprehensive exam on material from the previous chapters. The final exam is worth 200 points. The credit given on exam questions will be proportional to the amount of correct work shown. Little to no credit will be given if sufficient work is not shown, even if the final answer is correct.

Extra Credit: There *may* be a few extra credit assignments during the semester. All extra credit opportunities will be given to the **entire class** and must be completed by the specified due date. There is no individual extra credit.

Problem Presentations: In order encourage you to develop your ability to communicate mathematical content from the course, each of you will be expected to present proofs or solutions to presentation eligible problems during class time. You will be graded on both the accuracy of the mathematical content presented and the clarity and effectiveness of your presentation. These presentations will contribute points toward your final course grade.

Group Project & Presentation: You will be assigned a group project during the course. Your group will be asked to give an oral presentation based on your project topic at some point during the semester. The project write-up is worth 25 points and the oral presentation is worth 25 points.

Course Grading Policy: Your final grade in the course will be computed as follows:

Journals and Writing Assignments	40 points
Presentations & Activities	150 points
Homework & Quizzes	150 points
Group Project & Presentation:	50 points
Chapter 1 Exam:	60 points
Chapter 2 and 3 Exams:	200 points
Final Exam:	200 points
Total:	850 points

I will compute the percentage of the total possible points earned during the semester and will assign letter grades based on the following scale. I may make slight adjustments to this scale (moving % ranges down, never up).

96.5-100.0%	A+	81.5-86.4%	B	69.0-71.4%	C–
91.5-96.5%	A	79.0-81.4%	B–	66.0-68.9%	D+
89.0-91.4%	A–	76.5-78.9%	C+	60.0-65.9%	D
86.5-88.9%	B+	71.5-76.4%	C	<60.0%	F

Make-up Work: I only give make-up assignments for *emergencies* or for absences officially sanctioned by the University. I will expect written documentation in either of these cases. If you miss an exam and a make-up exam is not warranted, you may replace your grade on **one** missed exam with your *un-scaled* percentage score on that portion of the final exam.

Learning Accommodations: Minnesota State University Moorhead is committed to providing equitable access to learning opportunities for all students. Accessibility Resources (AR) is the campus office that collaborates with students who have disabilities to provide and/or arrange accommodations.

- If you have, or think you may have, a disability (e.g. mental health, attentional, learning, chronic health, sensory or physical) please contact the AR at (218) 477-4318 (V) or (800)627.3529 (MRS/TTY) to schedule an appointment for an intake.
- Additional information is available on the AR website: http://www.mnstate.edu/accessibility

If you are registered with the AR and have a current Accommodation Letter, please schedule an appointment to visit with me, during my office hours, to discuss implementation of your accommodations.

Academic Honesty: You are expected to do your own work. You may work with others and get help on assignments, but, unless the assignment is specifically designed as a group assignment, all work that you submit must be your own (or should be appropriately referenced). During exams and quizzes you will not be allowed to receive unauthorized help from others. Cheating and plagiarism are not tolerated in any course at any level. See the MSUM Academic Honesty policy for more information on the possible consequences of cheating.

Emergency Preparedness: As we prepare to start a new academic year and semester, the MSUM Facilities, Grounds & Safety Committee would like everyone to review the Emergency maps as well as the Emergency Preparedness Guide. Even a quick look at this information can make a difference in how you may react/respond in an emergency situation. If you have questions after reviewing this information, please contact Jim Schumann, Director of Public Safety for further clarification. Thank you in advance for taking time to help protect yourself and others.

Building maps showing emergency exit routes, fire extinguisher locations, and fire alarm pull stations are conspicuously located in classrooms, labs, conference rooms, departmental main offices and residence halls. The Emergency Preparedness Guides (flip style booklets) are located with the maps.

Please review the floor plans as well as the guide so you know how to respond in an emergency situation to help protect yourself and others. If you have questions, please contact Jean Hollaar, Interim Director of Public Safety, at jean.hollaar@mnstate.edu or 218-477- 2070. https://www.mnstate.edu/publicsafety/

Thanks, And Let's Have a Great Semester!!