Mayville State University

Math 389, Modern Geometry, #37071

Spring 2025
Three (3) Credit Hours

Course and Instructor Information

Instructor Name: Mr. Fred P. Strand

Contact Information: CB 108B, fred.strand@mayvillestate.edu, Office #:701-788-4684, Cell #: 701-371-4393

Hours of Availability: 9:00am or By Appointment

Instruction Mode: On campus face-to-face

Time Zone: All times indicated throughout this syllabus reflect Central Time (CT).

Meeting Times and/or Location: CB 105 1:00 – 1:50pm M,W,F   Final Exam: Tuesday, May 13 @ Noon

Course Materials and Technologies

Required

Text: Geometry (2004), McDougal Littell, a division of Houghton Mifflin Company, Evanston, IL. ISBN: 0-618-25022-0. A calculator and computer access for internet use.
NOTE: I have textbooks for your use and an electronic version available if you want to use that.

Course Description

A study of K-12 and undergraduate topics. K-12 topics: polygons, platonic solids, tessellations, transformations and congruent triangles. Undergraduate topics: axiomatic Euclidean geometry, finite geometries, fractals, projective geometry, and non-Euclidean geometries. The study includes the integration of effective research-based teaching strategies to use geometry to model mathematical ideas and methods for mathematical proofs.
Pre-/Co-requisites: Math 103 or equivalent

Course Objectives

To successfully complete this course, the learner will be expected to meet the following objectives, as aligned to Mathematics Education Program Approval Standards through North Dakota's Education Standards and Practices Board (ND ESPB):

1. Students will be able to identify the various types of geometric shapes, their algebraic equations and whether they occur in Euclidean or Non-Euclidean geometries.
2. Students will be able to recognize the names of mathematicians who contributed to the field of geometry.
3. As part of a competency in technology:

    a. Students will explore GeoGebra, a dynamic program used to combine geometry with algebra. And, they will use GeoGebra to demonstrate how to: draw circles, make measurements and constructions. Transform given objects by translating, reflecting and rotating.

    b. Students will construct a PowerPoint (or use another format) presentation on Fractals.

    c. Students will demonstrate the skills to use the internet to find and review(evaluate) videos that show geometric math and post their evaluations to the Blackboard discussion board.

    d. Students will explore non-Euclidean geometry, which is the geometry of spheres, cones and hyperbolic shapes; Sierpinski's and Pascal's triangles; and Koch's snowflakes and fractals through internet lessons.

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Standards Alignment (Mathematics Education Program Approval Standards-ND ESPB):

- o 11010.1 Mathematical Practices and Processes: The program requires the candidate to demonstrate the following: a. makes sense of problems and perseveres in solving them, b. reasons abstractly and quantitatively, c. constructs viable arguments and proofs, d. critiques the reasoning of others, e. uses mathematical models, f. attends to precision, g. identifies elements of structure, h. engages in mathematical communication
- o 11010.2 Mathematical Connections: The program requires the teacher candidate to demonstrate the interconnectedness of mathematical ideas and how they build on one another. The candidate recognizes and applies connections among mathematical ideas and across various content areas as well as real-world contexts, using the language of mathematics to express ideas precisely, both orally and in writing to multiple audiences
- o 11010.3 Secondary School Content Knowledge: The program requires the teacher candidate to demonstrate and applies knowledge of secondary mathematics concepts, algorithms, procedures, applications in varied contexts, and connections within and among mathematical domains (Complex Number System, Algebra, Geometry, Trigonometry, Statistics, Probability, Calculus, and Discrete Mathematics)
- o 11010.4 Undergraduate Mathematics Content Knowledge: The program requires the teacher candidate to demonstrate and apply knowledge of the core mathematics content including calculus, axiomatic geometry, linear and abstract algebra, statistics, probability, and computer programming.
- o 11010.5 Historical Perspective: The program requires the teacher candidate to demonstrate knowledge of the historical development and perspective of mathematics including contributions of significant figures and diverse cultures
- o 11010.6 Instructional Tools: The program requires the teacher candidate to select and use appropriate instructional tools such as manipulatives and physical models, drawings, virtual environments, spreadsheets, presentation tools, and mathematics-specific technologies (e.g., graphing tools, interactive geometry software, computer algebra systems, and statistical packages); and makes appropriate decisions about when such tools enhance teaching and learning, recognizing both the insights to be gained and possible limitations of such tools

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Course Expectations

- Students will be completing written assignments, which they will be sharing with their classmates on a daily basis.
- Course notes will be taken and used on quizzes and exams.
- Class discussions will be an integral part of this course, and students are expected to participate in our class discussions and projects.
- Class attendance is expected.

Learning Experiences:
1. Participate actively in class discussions and activities.
2. Assignments will be given in class or in a detailed handout.

3. Submit all assignments on designated due dates.
   - Reduction in points earned if late.
4. Exams will be taken on the scheduled date unless prior arrangements have been made.
5. Read all reading assignments.

Instructional Strategies:

Class discussion, lecture, cooperative grouping, written assignments, instructor feedback- both oral and written, exams, board work, and other methods that may occur during the course.

Instructor/Student Communication

- Students are accountable for all academic communications sent to their Mayville State University e-mail address. And, are responsible for checking the Blackboard course shell regularly.
- Students can expect me as your instructor, to respond to your correspondence in a timely manner. Generally, I will respond within hours of receiving your contact, but I will respond within 24 hours.

Assignments and Assessments

This course will cover chapters 1-8, 10, & 11 throughout the semester.   Assignments will be shared during class sessions and all assessments and due dates will be announced by the instructor.

Evaluation and Grading

Your grade will be determined using a percent based on total points.
Points will be earned by completing the following:
- Homework Assignments (at 20 points each)
- Written Exams (4 or 5 at 100 points each)
- Internet Lessons Project (at 50 points)
- GeoGebra Explorations (at 50 points)
- Fractal Exploration & Presentation (at 50 points)

Letter grades will be assigned only at the end of the semester. Points will be assigned for all work during the semester.
A final course grade will be assigned based on the following system:

90 – 100 = A   80 – 89 = B   70 – 79 = C   60 – 69 = D   0 – 59 = F

I expect students to pay full attention during class discussions. This means CELL PHONES are off and computers are for class work only.

Note: The course website contains an online gradebook where all scores for the course will be posted whenever they are recorded. You are encouraged to check your grades online often and to notify the instructor of any questions you have about your scores.

Enrollment Verification

On-Campus Course Statement

The U.S. Department of Education requires instructors to conduct an activity which will validate student enrollment in this course. Class attendance will be used to verify enrollment in on-campus courses. If you do not attend, your enrollment in this course will be at risk.

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Important Student Information

In the Announcements section of the Blackboard Institution Page, you can view and download the Important Student Information document for the current academic year. It includes information about:

- ✓ Land Acknowledgement Statement
- ✓ Academic Grievance Concerns and Instructor English Proficiency
- ✓ NetTutor - Online Tutoring Program
- ✓ Starfish - Student Success System
- ✓ Students with Documented Disabilities
- ✓ Student Learning Outcomes / Essential Learning Outcomes
- ✓ Academic Honesty
- ✓ Emergency Notification
- ✓ Continuity of Academic Instruction for a Pandemic or Emergency
- ✓ Family Educational Rights and Privacy Act of 1974 (FERPA)
- ✓ Diversity Statement (Title IX)

Course Timeline/Schedule

This course will cover chapters 1-8, 10, & 11 throughout the semester. Assignments will be shared during class sessions and all assessments and due dates will be announced by the instructor throughout the semester.

The Academic Program Student Learning Outcomes document can be found in your course shell. It contains all learning outcomes pertaining to Essential Studies courses and all majors and minors. The document has an index, so you can quickly find the degree you are pursuing.

As part of Mayville State's effort to demonstrate continuous improvement in achieving student learning outcomes, this course:

☒ introduces SLO # 1   ☒ introduces SLO # 2   ☒ introduces SLO # 3   ☒ introduces SLO # 4

Conceptual Framework

Teacher Education courses are based upon the Conceptual Framework: Reflective Experiential Teacher. See the document 'Conceptual Framework' provided in the course shell.

Changes: The instructor reserves the right to amend, adjust, or otherwise modify the syllabus at any time during the course.