Instructor: Bill Blubaugh, Ph.D.  
Email: bill.blubaugh@unco.edu
Office phone: 970-351-2028  
Math office: 970-351-2820
Office: Ross Hall 2239D  
FAX: 970-351-1225
Office hrs: 9:30 -10:00 (M W F),  
11:00 - 12:00 (M W F)  
2:30 - 3:30 (M W F)  
Others by appointment
Credit: 3 semester hours

Prerequisites: Completion of MATH 182 or its equivalent with a "C" or better.

Course Description: This is the third of a 3-course sequence particularly pertinent to prospective elementary teachers, involving advanced topics of fundamental mathematics from a modern approach. The content-driven courses models pedagogically sound instructional strategies, including the use of appropriate instructional tools such as manipulatives and technology. The course focuses on the PreK-6 nature of the NCTM and Colorado Model Content Standards in mathematics. Its primary emphasis is the development of spatial reasoning in geometry and measurement. Explorations focus on the investigations of two- and three-dimensional shapes, including their properties, measurements, constructions, and transformations. Mathematics content is presented in a problem solving and exploratory context. Geometry is full of exciting discoveries - be prepared to have fun!

Required Text:  

Required Materials: Ruler, compass, protractor, Mira (at the bookstore), and scissors.

Suggested Materials: Colored pencils or markers, and a geoboard (available at www.etacuisenaire.com. Search for “double-sided geoboards” or “deluxe wooden geoboards”)

Course Content:  
Topics will be drawn from:  
- Patterns and problem solving  
- Algebraic thinking  
- Inductive and deductive reasoning  
- Proportional reasoning (including rational number sense and proportion-related problems)  
- Measurement  
- Analytic geometry  
- Congruence mappings: translation, reflection, rotation
Similarity mappings: dilation
3-D geometry

Course Requirements:
- We are a mathematical community of learners where community support and active participation are the norm. We will learn from each other as ideas are shared.
- Communication such as calls, email and office visits are encouraged. Information will be covered in class which may not be in the required materials; you are responsible for any information missed.
- Work submitted for evaluation should be dated, organized, and legible.
- Course project including a poster: details and the grading rubric will be distributed at a later date. The project presentations, in groups, will be held at the semester's end.
- Examinations, with in-class and/or take-home components, will be given.

Professionalism, Participation, and Attendance:
A high degree of professionalism, participation and attendance in class are expected. Remember that you are responsible for your learning and conduct. Missing more than threee classes could have an effect on your course grade. The UNC student rights and responsibilities/Code of conduct is also available at: www.unco.edu/dos/handbook/links.htm.

Code of Conduct:
- Be on time to all classes and attend the entire class period.
- Focus on class, be a positive participant, and limit side activities or interruptions.
- Come prepared and with as positive and energetic attitude as possible.
- Gossip, negativism, and rudeness will not be acceptable.
- Respect each person, treat each other with dignity, and encourage all to participate.
- Focus on learning.
- All assignments are to be turned in on time - late work is not accepted.

Homework/Quizzes:
Homework will be collected for grading three or four times. Homework is expected to be neat and organized (e.g., no spiral pages will be accepted) with justification for your work, even if you used a calculator or mental math. You are encouraged to work with colleagues on your homework. Quizzes may include homework exercises, similar exercises, or slightly non-routine problems. Graded homework and quizzes will each be worth about 25 points.

Examinations:
In-class tests are each worth 50 to 100 points. The 100-point final exam is comprehensive and will be taken in class during final exam week. Note the testing dates and prepare your schedule (e.g., work schedule, flight reservation) in consideration; NO exceptions will be made. Evaluation of the examinations is based on point values of each test item, with partial credit awarded as appropriate.
Project:
The purpose of the MATH 283 project is not only to provide you an opportunity to show your knowledge of course content and pedagogy in another way, but also to give you the choice of a particular area that you would like to explore and develop more fully. Projects should be well written. You must have a poster board or some “model display” of your project. You might want to develop one or more activities that would help an elementary school student understand and learn a particular topic. You can also use technology in your presentation such as PowerPoint.

Paper Write-up

<table>
<thead>
<tr>
<th>0 points</th>
<th>5 points</th>
<th>10 points</th>
<th>15 points</th>
<th>20 points</th>
<th>25 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>The paper write-up was not completed.</td>
<td>The write-up of the paper is very unclear.</td>
<td>The content of the paper is somewhat clear.</td>
<td>The paper is reasonably neat and organized.</td>
<td>The paper is neat and somewhat professional in content and style.</td>
<td>The writing enhances the perception of the student as capable and qualified.</td>
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Presentation/Display

<table>
<thead>
<tr>
<th>0 points</th>
<th>5 points</th>
<th>10 points</th>
<th>15 points</th>
<th>20 points</th>
<th>25 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A presentation was not made.</td>
<td>The presentation was unprepared and no display.</td>
<td>The presentation was good and the display was fair.</td>
<td>The presentation and display were both acceptable.</td>
<td>The presentation and display were of high quality.</td>
<td>The presentation and display were of highest quality.</td>
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Evaluation:

Approximate Number of Points Per Graded Task
- 50 points Project
- 100 points Homework/Quizzes
- 150 points Examinations
- 100 points Comprehensive Final Examination

Final Grade Assignment as Percent of Total Points Obtained

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>92.5% or greater</td>
</tr>
<tr>
<td>A-</td>
<td>90.0 to 92.4%</td>
</tr>
<tr>
<td>B+</td>
<td>87.5 to 89.9%</td>
</tr>
<tr>
<td>B</td>
<td>82.5 to 87.4%</td>
</tr>
<tr>
<td>B-</td>
<td>80.0 to 82.4%</td>
</tr>
<tr>
<td>C+</td>
<td>77.5 to 79.9%</td>
</tr>
<tr>
<td>C</td>
<td>72.5 to 77.4%</td>
</tr>
<tr>
<td>C-</td>
<td>70.0 to 72.4%</td>
</tr>
<tr>
<td>D+</td>
<td>67.5 to 69.9%</td>
</tr>
<tr>
<td>D</td>
<td>62.5 to 67.4%</td>
</tr>
<tr>
<td>D-</td>
<td>60.0 to 62.4%</td>
</tr>
<tr>
<td>F</td>
<td>59.9% or less</td>
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Descriptions and Expectations of Assessments:

Homework: We will take a few minutes every class period to address any questions from the homework. You will always have a class period to ask questions about the homework before having a quiz over it.

- Late work will not be accepted.
- Work is expected to be organized and stapled in order.
- Homework is the responsibility of each individual; however, you are encouraged to work with others outside of class time to complete your homework.
- Homework is your study material for tests! Justify your results, even if you used a calculator or mental math. Explain yourself using words or drawings. You should ask yourself: Will I be able to understand my work when reviewing for the test? Keep your homework after it is returned.
- Collected work will be scaled to 20 points. Each homework question will be worth 2 points. Two points will be awarded if the solution is completely correct, one point will be awarded for a solution with an error, and no points will be awarded for incorrect and incomplete solutions.
- Since some of the homework will be group assignments, it is vital that you attend all classes. Each of these group assignments will also be scaled to 20 points. You will not receive credit for the assignment if you are not in class to work on the project/assignment.
- Late homework will not be accepted.

Quizzes: Typically each quiz will consist of 5 questions. You will not be able to make up any missed quizzes. Each quiz is worth 20 points.

Tests and Final Comprehensive Exam: All tests and the final will be in-class and notes will not be allowed. Some portions of an exam may include a non-calculator portion. You will not be allowed to make up a missed test. Evaluation of the examinations is based on point values of each test item, with partial credit awarded as appropriate.

Missed Materials: Outside of my office (Ross 2239D), you will find a file for your class. This folder is for handouts, graded hw, tests, quizzes, etc. that you may not have picked up during class. You can pick up these materials at any time - I do not need to be present. Please do not use this folder for materials that you want to turn into me.

Student Guidelines for Participation in Meaningful Mathematical Discussions

- Listen carefully to the ideas being express to see if they make sense to you.
- As appropriate ask for clarification if you do not understand what is being talked about. Very likely you are not the only person who is confused.
- Depending on the context, express your ideas in such a way that your entire group or class can hear you idea.
- Asking if anybody has any questions about what you said can be a great way to help clarify the ideas you are trying to present.
- In the final analysis, you are responsible for finding a way to make sense of the mathematics that is covered in the class.
UNC Policies

- **Academic Freedom:** UNC’s policies and recommendations for academic misconduct will be followed. Consult your student handbook for university policies on student conduct in the classroom, cheating, plagiarism, and other academic expectations (http://www.unco.edu/dos/handbook/index.html). You are expected to attend class and take responsibility for your own learning.

- **Disability Support Services:** Students who believe that they may need accommodations in this class are encouraged to contact the Disability Support Services at (970)-351-2289 as soon as possible to ensure that accommodations are implemented in a timely fashion.

- **Honor Code:** All members of the University of Northern Colorado community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. These core elements foster an atmosphere, inside and outside of the classroom, which serves as a foundation and guides the UNC community's academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.

- **Portable Electronic Devices** - Please extend courtesy to your instructor and fellow students by turning off your portable electronic devices such as: cell phones, pagers, and iPods. Although not an audio issue, text-messaging is a distraction to other students and prevents you from full participation in class. You should keep your portable electronic devices in your backpack or purse during class. Your personal electronic devices should not be on your desks. If you know that you may need to accept an emergency phone call during class or if you have children in childcare or school, please let the instructor know. If you need to take a phone call during class, please step out of the classroom while you complete your call. Thank you for your cooperation.

**Tutoring Services:** There are two resources you can seek out for tutoring:

- The Math Lab, located in Ross Hall Room 1250, provides drop-in tutoring services for MATH 283 and other students. Available times will be posted on the door and online at http://hopper.unco.edu/mathed/tutoring.
- Tutoring is also available at the Center for Human Enrichment in the basement of Michener. Appointments are necessary for each one-hour appointment. To schedule an appointment, you need to go to the center. Sessions with a tutor are provided for one hour. An appointment has to be made for each tutoring session.

**Important Dates:**

- January 18: Martin Luther King Day, No Classes
- January 15: Last day to add a class
- January 25: Last day to drop a class
- March 6: Last day to withdraw from classes and receive a 'W'
- March 13-21: Spring Break - No classes
- April 30: Last Day of Classes
- May 5: Final Exam for 1:25 PM class, Wednesday from 1:30 to 4:00
- May 7: Final Exam for 10:10 AM class, Friday from 8:00 to 10:30
### Tentative Schedule:

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Concurrent Topics</th>
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| Weeks 1-4: January 11 | Chapter 1: Polygons and Angle Relationships  
Chapter 2: Quadrilaterals and Their Definitions  
Chapter 3: Constructions by Paper Folding  
Chapter 4: Explorations in Three-dimensional Geometry |
| Weeks 5-8: February 8 | Chapter 5: Area  
Chapter 6: Explorations with Geoboard Areas  
Chapter 7: Similarity and Slope  
Chapter 8: Pythagorean Theorem and Perimeter |
| Weeks 9-12: March 8 | Chapter 9: Geometry of circles  
Chapter 10: Straightedge and Compass Constructions  
Chapter 14: MIRA Constructions  
Chapter 15: Symmetry |
| Weeks 13-14: April 12 | Chapter 16: The Four Symmetries  
Symmetries and the Mira (Supplemental Materials, if time)  
Computer Sketchpad Explorations (like Chapter 13, if time)  
Review for Final |
| Week 15: April 25 | Project Presentations (or one per week during semester) |
| Final Exam: May 3 - 7 | (1:23 class) Wednesday, 1:30 and (10:10 class) Friday, 8:00 |