Instructor: William Blubaugh, Ph.D.  
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Office phone: 970-351-2028  
Math office: 970-351-2820  
Office: Ross Hall 2239D  
FAX: 970-351-1225  
Office hrs: 9:00 -9:30 AM (MTWTh), Others by appointment  
Credit: 3 semester hours

Course Specifications

Course Description:
This is the capstone 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. MATH 283, in particular, addresses geometric and algebraic concepts, emphasizing problems solving, reasoning, communication, connections and representations. Software (e.g., Geometer's Sketchpad), graphing calculators, and manipulatives will be used throughout the course.

Required Materials:
♦ Bounded notebook of materials available at the Book Stop north of campus.  
♦ Graphing calculator (recommended TI-73, but TI-83/84 OK), compass, protractor, ruler, MIRA.

Prerequisites:
MATH 182 or equivalent.

Course Obligations:
As part of the Required Core Courses, successful completion of MATH 283 satisfies the mathematics requirement for the IDLA program. The ultimate goal of this course is to increase content knowledge, broaden teaching practices and foster confidence in teachers of elementary mathematics. MATH 283 content involves:
♦ using mathematics to formulate and solve problems  
♦ using mathematics to reason and to structure investigation  
♦ communicating mathematical processes and solutions in written and oral form  
♦ connecting mathematical ideas to one another and to the world around us  
♦ representing mathematical concepts and objects in multiple forms  
♦ strengthening and extending the mathematical knowledge base  
♦ encouraging logical reasoning and critical thinking  
♦ emphasizing the role of culture and history in the development of mathematics  
♦ experiencing sound pedagogical strategies appropriate for the course and applicable to elementary school mathematics, including:
  • inquiry-based approach to the teaching and learning of mathematics  
  • manipulatives to develop conceptual understanding from concrete to abstract  
  • technology to enhance the learning of mathematics
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:
- Attendance and participation as components of professionalism are expected. We are a mathematical community of learners where community support and active participation are expected. 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 is not in the required materials; you are responsible for any information missed.
- Work submitted for evaluation should be dated, organized, and legible.
- Examinations, with in-class and/or take-home components, will be given. You may collaborate on the take-home component, but individual submissions must be made.
- The final examination is comprehensive and in-class. You must work alone.

Special Needs:
Students with special situations, such as childcare, are encouraged to speak with me privately so that I am aware of your needs. Students with disabilities are encouraged to contact the Disability Access Center at 970-351-2289 as soon as possible to better ensure that such accommodations are implemented in a timely fashion.

EVALUATION

Grading allotment:
- 100 points Homework/Quizzes
- 150 points Tests
- 100 points Comprehensive Final Exam

Final grade assignment:
- 315 ≤ A
- 280 ≤ B ≤ 314
- 245 ≤ C ≤ 279
- 210 ≤ D ≤ 244
- F ≤ 209
GRADING CRITERIA

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 two 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.
• Please extend courtesy to your instructor and fellow students by turning off your cell phones and pagers. Thank you for your cooperation.
• Focus on class, be a positive participant, limit side activities, or interruptions (e.g., side conversations, working on other things during class, sleeping, reading the newspaper, playing video games on palm pilot, etc.)
• 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.

An absence may be excused if written documentation shows the absence was unavoidable.

Homework/Quizzes:
Homework will be collected for grading two 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 points. The 100-point final exam is comprehensive and will be taken during the last day of class. 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.

Tutoring Services:
Tutoring is 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. Drop-in tutoring is also available by the Department.
## Tentative Class Schedule:

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/29</td>
<td>M</td>
<td>Introduction, and Polygons &amp; Plane Figures</td>
</tr>
<tr>
<td>6/30</td>
<td>T</td>
<td>Points, Lines, and Their Relationships; Line and Angle Relationships</td>
</tr>
<tr>
<td>7/1</td>
<td>W</td>
<td>Theorems About Intersecting Lines; Polygons</td>
</tr>
<tr>
<td>7/2</td>
<td>Th</td>
<td>Triangles and Quadrilaterals: Possibly using Microworlds</td>
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<tr>
<td>7/6</td>
<td>M</td>
<td>Polygons and Their Measurements</td>
</tr>
<tr>
<td>7/7</td>
<td>T</td>
<td><strong>Homework #1 &amp; Quiz #1; More about Polygons - Regular, Symmetries</strong></td>
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<tr>
<td>7/8</td>
<td>W</td>
<td>Constructing Polyhedrons</td>
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<tr>
<td>7/9</td>
<td>Th</td>
<td>More about Polyhedrons</td>
</tr>
<tr>
<td>7/13</td>
<td>M</td>
<td>Microworlds or Sketchpad, and Review for Test #1</td>
</tr>
<tr>
<td>7/14</td>
<td>T</td>
<td><strong>Test #1; Tessellations of Polygons; Tessellations with Regular Polygons</strong></td>
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<tr>
<td>7/15</td>
<td>W</td>
<td>Analysis of Semi-regular Tessellations</td>
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<tr>
<td>7/16</td>
<td>Th</td>
<td>Triangles and Quadrilaterals; Computer Lab</td>
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<tr>
<td>7/20</td>
<td>M</td>
<td><strong>Quiz #2; Tessellations of Curved Patterns</strong></td>
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<tr>
<td>7/21</td>
<td>T</td>
<td>Regular Polyhedra; Flips or Reflections</td>
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<tr>
<td>7/22</td>
<td>W</td>
<td>Combining Slides, Turns, and Flips</td>
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<tr>
<td>7/23</td>
<td>Th</td>
<td>Slides or Translations, Turns or Rotations; Computer Lab</td>
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<tr>
<td>7/27</td>
<td>M</td>
<td><strong>Homework #2 &amp; Test #2; Motions and Congruence</strong></td>
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<tr>
<td>7/28</td>
<td>T</td>
<td>Magnification and their Properties</td>
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<tr>
<td>7/29</td>
<td>W</td>
<td>Computer Lab on Magnifications</td>
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<tr>
<td>7/30</td>
<td>Th</td>
<td>Catch-up</td>
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<tr>
<td>8/3</td>
<td>M</td>
<td><strong>Test #3; Computer Lab on Motions and Congruence</strong></td>
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<tr>
<td>8/4</td>
<td>T</td>
<td>Measurement in One and Two Dimensions</td>
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<tr>
<td>8/5</td>
<td>W</td>
<td>Measurement in Three Dimensions</td>
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<tr>
<td>8/6</td>
<td>Th</td>
<td><strong>Final Exam</strong></td>
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