**Division:** Teacher Education  
**Program Area:** Mathematics Education  
**Course #:** MAE 6210/MAT 6210  
**Course Title:** Teaching Geometry, Probability & Statistics, and Discrete Mathematics from an Advanced Perspective  
**Course Credit:** 3 semester hours  
**Section #:** 001/001  
**Call #:** 21699/21918  
**Term/Year:** WI 2017  
**Course Location:** 255 Education Building  
**Day /Time:** Thursdays 5:00-7:30 p.m.  
**Instructor:** Kristen Meck, M.Ed.  
**Office Address:** Education  
**Office Hours:** By appointment  
**Office Phone:** (313)577-0980  
**E-mail:** E-mail is my preferred mode of communication;  
aw7218@wayne.edu

**Course Description:** Prereq.: Completion of a major in mathematics or secondary mathematics education. Historical perspectives, common conceptions and misconceptions, applications, technology, and mathematical connections relative to teaching geometry (including trigonometry), probability & statistics, and discrete mathematics in secondary schools.

**Course Outcomes:**

<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Assignments aligned to outcomes</th>
<th>InTASC aligned to assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Learn to use a historical perspective in the teaching of mathematics.</td>
<td>Evidenced by articles reviews and term paper/project</td>
<td>Standard #7: Planning for Instruction</td>
</tr>
<tr>
<td>2. Identify unifying &quot;big ideas&quot; in geometry, probability &amp;, statistics and discrete mathematics.</td>
<td>Evidenced by in class activities, articles reviews, quizzes, and term paper/project</td>
<td>Standard #4: Content Knowledge Standard #5: Application of Content Standard #7: Planning for Instruction Standard #8: Instructional Strategies</td>
</tr>
<tr>
<td>3. Demonstrate awareness of common misconceptions in geometry, probability</td>
<td>Evidenced by articles reviews and term paper/project</td>
<td>Standard #1: Learner Development Standard #4: Content Knowledge</td>
</tr>
</tbody>
</table>
& statistics, and discrete mathematics, as well as their implications for instruction.  

<table>
<thead>
<tr>
<th>Standard #7: Planning for Instruction</th>
<th>Standard #8: Instructional Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Learn to use applications of mathematics to teach mathematical content.</td>
<td>Evidenced by in class activities, quizzes, internet resources, and term paper/project</td>
</tr>
<tr>
<td>5. Learn appropriate uses of technology to support instruction in geometry, probability &amp;, statistics, and discrete mathematics.</td>
<td>Evidenced by in class activities and discussions, and internet resources</td>
</tr>
<tr>
<td>6. Identify mathematical connections in geometry, probability &amp;, statistics, and discrete mathematics, and learn how to foster such connections in the classroom.</td>
<td>Evidenced by in class activities and discussions, and term paper/project</td>
</tr>
<tr>
<td>7. Connect the collegiate mathematics they have studied with national and state standards for the teaching and learning of secondary school mathematics (e.g., NCTM’s Principles and Standards for School Mathematics, the Michigan Curriculum Framework for Mathematics, Common Core State Standards).</td>
<td>Evidenced by in class activities and discussions, and term paper/project</td>
</tr>
</tbody>
</table>

**Required Text:**  
[http://www.corestandards.org/Math](http://www.corestandards.org/Math)  

**References:**  


**Class Policies:** Regular and punctual attendance and active participation in class activities are givens for every course in the professional sequence. This course will be presented partly in a workshop format and partly in a seminar format. Because a seminar involves the free exchange of ideas, all students will be expected to actively participate in class discussions. Failure to participate in the discussion of any assigned readings will be interpreted as an indication of unfamiliarity with those readings. All assignments are due when indicated. Any assignments that are submitted late will be graded-down at least one letter grade. It will frequently be helpful to have in class a graphing calculator with statistical analysis tools (e.g., a TI-83/4). **You may not use a cell phone as a calculator on any quiz and/or exam.**
Course Assignments: Students are responsible for all assigned readings, as well as for information and ideas presented and discussed in class. Detailed descriptions and grading criteria for each assessment item will be available via Blackboard. Course grades will be determined according to the following:

1. Article Reviews (3 @ 10% each)  
2. Quizzes (3 @ 10% each)  
3. Internet Resources (3@ 5% each)  
4. Final Examination (25%)

Article Reviews: Each student will review three journal articles, one that relates to the learning and teaching of geometry, one that relates to the learning and teaching of probability & statistics, and one that relates to the learning and teaching of discrete mathematics topics. Include a full reference citation for the article (if uncertain what that means, please ask), a brief synopsis of the article, a rationale for selecting the article for review, and an indication of how you intend, or do not intend, to use the ideas in the article in your teaching and why/why not. A well-written article review will probably run 2-3 typewritten, double-spaced pages. Students will briefly discuss their review in class the day it is due. The Article Reviews are due on February 2, March 2, and March 30. Electronic submission via Blackboard of the article reviews is required (the file attachment must include your last name).

Quizzes: Based on material covered in class. Short (approx. 15-20 min.) quizzes will be given on February 9, March 9, and April 13.

Internet Resources: Each student will identify three resources that were found on the Internet, one each for teaching geometry, probability & statistics, and discrete mathematics. For each resource, include the URL, a brief description of the resource, and how you intend to use it in your teaching (or why you would not use it in your teaching). Students will briefly discuss one of their resources in class the day it is due. The Internet Resources are due on April 20, and must be submitted via Blackboard (again, the file attachment must include your last name).

Final Examination: A cumulative final exam will be administered on April 27.
Grading System: Teacher Education Grading Policy The Teacher Education faculty members strive to implement assessment measures that reflect a variety of strategies in order to evaluate a student's performance in a course. For undergraduates and post-bachelor students C grades will be awarded for satisfactory work that satisfies all course requirements; B grades will be awarded for very good work, and A grades will be reserved for outstanding performance. [For graduate students B grades will be awarded for satisfactory work that satisfies all course requirements; B+, grades will be awarded for very good work, and A grades will be reserved for outstanding performance.] Please note that there is a distribution of grades from A-F within the College of Education and that plusses and minuses are recorded and distinguish distinct grade point averages.

Undergraduate Grading Scale based on total percentage:
93-100 A
90-92.9 A-
87-89.9 B+
83-86.9 B
80-82.9 B-
77-79.9 C+
73-76.9 C
70-72.9 C-
67-69.9 D+
63-66.9 D
60-62.9 D
Below 60 F

Graduate Grading Scale based on total percentage:
93-100 A
90-92.9 A-
87-89.9 B+
83-86.9 B
80-82.9 B-
77-79.9 C+
73-76.9 C
Below 73 F
*Class Schedule:*

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic(s)</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12 Jan.</td>
<td>Review syllabus; What does “an advanced perspective” mean? ;The parallel postulate; Geometry</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>19 Jan.</td>
<td>Geometric constructions and their applications</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>26 Jan.</td>
<td>Area problems</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2 Feb.</td>
<td>Discuss articles; The geometry standards; Proof and structure in geometry</td>
<td>Geometry Article Review Due</td>
</tr>
<tr>
<td>5</td>
<td>9 Feb.</td>
<td>Quiz 1; Modeling in Geometry</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>16 Feb.</td>
<td>The nature of randomness; Probability theory; Representativeness</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>23 Feb.</td>
<td>Expected value; Fairness; Lotteries</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2 Mar.</td>
<td>Discuss articles; Availability; The conjunction fallacy; NCTM/Common Core</td>
<td>Prob. &amp; Stat. Article Review Due</td>
</tr>
<tr>
<td>9</td>
<td>9 Mar.</td>
<td>Quiz 2: Importance of Statistics; Law of Large Numbers; Regression</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16 Mar.</td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>23 Mar.</td>
<td>Fair elections, apportionment, and fair division</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>30 Mar.</td>
<td>Discuss articles; Graph theory—shortest path algorithms, minimal spanning tree; Euler and Hamiltonian paths &amp; circuits</td>
<td>Discrete Math Article Due</td>
</tr>
<tr>
<td>12</td>
<td>6 Apr.</td>
<td>Iteration and recursion; location problems; queuing theory</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>13 Apr.</td>
<td>Quiz 3: Linear programming, integer programming and why it makes a difference. (If you have a laptop with Excel, please bring it to class for this week.)</td>
<td>Internet Resources Due</td>
</tr>
<tr>
<td>14</td>
<td>20 Apr.</td>
<td>Internet resources presentations; open</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>27 Apr.</td>
<td>Final Examination</td>
<td></td>
</tr>
</tbody>
</table>

*Instructor reserves the right to change the syllabus.

**Academic Dishonesty/Plagiarism**

The College of Education has a “zero tolerance” approach to plagiarism and other forms of academic dishonesty. (See Student Code of [http://doso.wayne.edu/assets/codeofconduct.pdf](http://doso.wayne.edu/assets/codeofconduct.pdf). Plagiarism includes copying material (any more than 5 consecutive words) from outside texts or presenting outside information as if it were your own by not crediting authors through citations. It can be deliberate or unintended. Specific examples of academic dishonesty, including what constitutes plagiarism, can be found in the University’s Undergraduate Bulletin ([http://bulletins.wayne.edu/ubk-output/index.html](http://bulletins.wayne.edu/ubk-output/index.html)) and Graduate Catalog ([http://www.bulletins.wayne.edu/gbk-output/index.html](http://www.bulletins.wayne.edu/gbk-output/index.html)) under the heading “Student Ethics.” These university policies are also included as a link on Blackboard within each course in which students are enrolled. It is every student’s responsibility to read these documents to be aware which actions are defined as plagiarism and academic dishonesty. Sanctions could include failure in the course involved, probation and expulsion, so students are advised to think carefully and thoroughly, ask for help from instructors if it is needed, and make smart decisions about their academic work.
Enrollment/Withdrawal Policy
Students must add classes no later than the end of the first week of classes. This includes online classes. Students may continue to drop classes (with full tuition cancellation) through the first two weeks of the term.

Students who withdraw from a course after the end of the 5th week of class will receive a grade of WP, WF, or WN.
- WP will be awarded if the student is passing the course (based on work due to date) at the time the withdrawal is requested
- WF will be awarded if the student is failing the course (based on work due to date) at the time the withdrawal is requested
- WN will be awarded if no materials have been submitted, and so there is no basis for a grade

Students must submit their withdrawal request on-line through Pipeline. The faculty member must approve the withdrawal request before it becomes final, and students should continue to attend class until they receive notification via email that the withdrawal has been approved.

Beginning the fifth week of class students are no longer allowed to drop but must withdraw from classes. The last day to withdraw will be at the end of the 10th full week of classes. The withdrawal date for courses longer or shorter than the full 15-week terms will be adjusted proportionately.

See the university webpage for full details: http://reg.wayne.edu/students/information.php

Attention Students with Disabilities:
If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-202-4216 (video phone). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services’ mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

Religious Observance Policy:
Because of the extraordinary variety of religious affiliations represented in the University student body and staff, the Wayne State University calendar makes no provision for religious holidays. It is University policy, however, to respect the faith and religious obligations of the individual. Students who find that their classes or examinations involve conflicts with their religious observances are expected to notify their instructors well in advance so that alternative arrangements as suitable as possible may be worked out.

Additional Resource
Wayne State University Writing Center:
The Writing Center (2nd floor, UGL) provides individual tutoring consultations free of charge for students at Wayne State University. While the center serves both graduate and undergraduate students, undergraduate students in General Education courses, including composition courses, receive priority for tutoring appointments. The Writing Center serves as a resource for writers, providing tutoring sessions on the range of activities in the writing process – considering the audience, analyzing the assignment or genre, brainstorming, researching, writing drafts, revising, editing, and preparing documentation. The Writing Center is not an editing or proofreading service; rather, students are guided as they engage collaboratively in the process of academic writing, from developing an idea to correctly citing sources. To make an appointment, consult the Writing Center website: http://www.clas.wayne.edu/writing/.

To submit material for online tutoring, consult the Writing Center HOOT website (Hypertext One-on-One Tutoring) http://www.clas.wayne.edu/unit-inner.asp?WebPageID=1330.