**Spring 2011**

<table>
<thead>
<tr>
<th><strong>COURSE/Section #:</strong></th>
<th>MATH 3133-270</th>
<th><strong>COURSE TITLE:</strong></th>
<th>Foundations of Geometry</th>
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<tbody>
<tr>
<td><strong>PROFESSOR:</strong></td>
<td>Dr. Dawn Slavens</td>
<td><strong>PREREQUISITE:</strong></td>
<td>Math 2133</td>
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<td></td>
<td>Professor of Mathematics</td>
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<td><strong>CLASS MEETS:</strong></td>
<td>MW 3 – 4:20 PM BO 109</td>
<td><strong>TEXT:</strong></td>
<td>College Geometry Using The Geometer's Sketchpad By Barbara E. Reynolds SDS William E. Fenton</td>
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<tr>
<td><strong>FINAL EXAM DATE AND TIME:</strong></td>
<td>Monday, May 9th, 5:45 – 7:45 PM in BO 115</td>
<td><strong>OFFICE:</strong></td>
<td>Bolin Science Hall, Office 113A</td>
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<tr>
<td><strong>PHONE:</strong></td>
<td>Office: (940)-397-4013</td>
<td><strong>OFFICE HOURS:</strong></td>
<td>M: 9:00 am – 12:00 pm</td>
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<td></td>
<td>e-mail: <a href="mailto:dawn.slavens@mwsu.edu">dawn.slavens@mwsu.edu</a></td>
<td>TR: 2:00 pm – 4:00 pm</td>
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<td>F: 8:00 am – 10:00 am</td>
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<td>Other office hours are by appointment.</td>
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**GRADING POLICY:**

Grades will be calculated using the following point scheme:

- Exams: 35% of course grade
- Final Exam: 25% of course grade
- Other graded assessments of student work: 25% of course grade
- Active participation in-class: 15% of course grade

The traditional 90–80–70–60 scale will be used to determine course letter grades at the end of the semester.

**ATTENDANCE AND MAKE-UP WORK POLICIES:**

**Participation**

Students are expected to attend and be punctual to every class meeting. Excessive late arrivals or early departures from class will count as unexcused absences. Since this course relies heavily on group participation, any student with n unexcused absences, where \( n > 0 \), will lose \((2^n-1)\%\) from his/her final course average. For extreme circumstances in which the instructor is convinced that an absence was unavoidable, the instructor may consider an absence to be excused. It is the responsibility of the student to discuss any such absence with the instructor, as well as, when requested by the instructor, provide documentation supporting the reason for the absence. Regularly, between class meetings, students will be assigned to complete investigation type activities and come to class prepared to share your discoveries and thoughts about the mathematics within these activities. In addition, at times you will be asked to work specific problems from the text and come to class ready to present your solutions, or at least share your thoughtful ideas about solving the assigned problem. For each class meeting in which you have not prepared sufficiently (i.e. unable to have an intellectual discussion around the assigned activities or problems), your grade will be reduced by 1%.

**Homework**

Homework is due at the beginning of class, and late homework will not be accepted. A student who is absent may turn his/her homework in by faxing it to the attention of the instructor at 940-397-4442, or by scanning it and sending it through email to dawn.slavens@mwsu.edu. Homework must be faxed or emailed by the beginning of class to avoid being late.

**Exams**

No make-up exams will be given!!!
COURSE OBJECTIVES:

The most important objective of this course is to introduce students to mathematical thinking and reasoning through a hands-on exploration of interesting and challenging topics in geometry. The emphasis in this course is on conjecture, exploration of interesting geometric ideas, leading to the development of a robust proof or refutation. The goals of the course can be roughly divided into the broad areas of process goals (exploration, proof, and communication) and content goals (in synthetic, analytic, and transformational geometry.)

Process Goals

By the end of the course, the successful student will be able to

- **Explore**
  - use The Geometer’s Sketchpad with reasonable proficiency,
  - discuss ideas in geometry – and more generally, in mathematics – that contain unsolved questions and unresolved issues,
  - demonstrate an understanding of the need to justify or refute any conjecture,
  - conduct geometric experiments and form an opinion on the validity of a geometric statement—and if necessary, revise the statement based on these experiments,
  - demonstrate spatial reasoning by constructing representations of geometric objects and situations;

- **Prove**
  - use correct logical reasoning consistently,
  - visualize geometric situations at an appropriate level,
  - construct and interpret diagrams,
  - explain the role of axioms and undefined terms in a mathematical theory,
  - suggest possible proof methods for geometric statements appropriate to the course,
  - use various proof strategies appropriately – for example, direct proof, indirect proof, proof by contradiction, counterexample, etc.
  - develop proofs of appropriate sophistication;

- **Communication**
  - demonstrate an understanding of relevant mathematical vocabulary,
  - use geometric language more precisely,
  - discuss geometric ideas with peers,
  - present geometric arguments to groups of peers,
  - organize geometric ideas into coherent arguments or questions,
  - relate geometric statements to diagrams, and vice-versa,
  - read and critique mathematical arguments,
  - write coherent geometric proofs,
  - critique arguments made by peers.

Broad Content Goals

- Explore geometric relationships among classes of two- and three-dimensional objects – for example, congruence, parallelism, symmetry,
- Discover and verify basic properties of common geometric objects,
- Describe and explore spatial relationships using a coordinate system,
- Use transformations and symmetry to analyze geometric questions,
- Use algebraic techniques to analyze geometric questions.
OTHER INFORMATION:

Major Focus of Course Text Content: Chapters 1 – 7, 9

Software: It is recommended that students purchase the following software: The Geometer’s Sketchpad, Version 5. Students can purchase a non-expiring license or a one year license by scrolling to the bottom of the page of the following website (http://www.keypress.com/x24119.xml?Software=yes). Students who choose not to purchase the software can use computers on campus to complete homework that requires the use of the above software.

Instructor Availability: Office hours are when I will generally be available. However, if you become stuck or frustrated, come in and talk to me. You may make appointments if you have class during my office hours.

Additional Text: We will make some use of the text Geometry A Guided Inquiry, by G.D. Chakerian, et al. The instructor will provide loaner copies of this text as needed.

Reading: It is expected that you read the textbook. The class is not going to be run in a lecture style format. You must read the textbook or you will miss important information.

Homework: Homework will be assigned regularly and some of the homework will be turned in to be graded. Students will also be expected to present to the class many of their solutions to assigned problems.

Exams: Dates of in-class exams will be announced at least one week prior to the exam. Expect two in-class exams and one take-home exam.

Final Exam: The final exam will be comprehensive and must be taken at the time scheduled by the University, Monday, May 9th, 5:45 – 7:45 PM. The final exam may have a take-home component.

Cell Phones and Pagers: Please turn these off during class!

Leaving Class Early: If you need to leave class prior to the dismissal of class, you must have the permission of the instructor. If you have not received permission prior to leaving class early, you will be given an unexcused absent for that class period.

Student rights: All students should refer to the MSU Student Handbook for information related to student responsibilities, rights and activities. Topics such as Student Affairs and Student Life, Academic Issues, Financial Issues, University Policies and Procedures, and Code of Student Conduct are included in this handbook.

Evidence of cheating: If there is evidence of cheating on an exam or plagiarism on any written assignments or take-home exams, or assisting a student in cheating or plagiarizing, you will receive a zero on the work and possibly a letter grade of F for the course. Further, university policy concerning reporting evidence of cheating to college deans, etc. will be followed.

Education is not received. It is achieved. – Author unknown