Course Information       Math 133, Winter 2010

Instructor: Dr. Julie Bergner
Class: MWF 9:10-10:00 am, LFSC 2418
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Teaching Assistant: Brian Rolle
Discussion section: R 8:10-9:00 am, ENGR2 141

Course Objectives: The goal of this course is for you to demonstrate knowledge of geometry at a rigorous level. The specific course objectives are:

1. Students will learn how axiom systems and logical deductions (proofs) provide the foundation of mathematics.
2. Students will learn to read and write proofs.
3. Students will learn the basic ideas of Euclidean geometry.
4. Students will learn to conjecture and prove new results.
5. Students will develop communication skills in presenting mathematics, both in small groups and at the blackboard.
6. Students will learn to use dynamic geometry software.
7. Students will learn basic models and properties of non-Euclidean geometry (time permitting).

Format of the course: After introductory discussions on axiom systems and logical deduction, we will work through proofs of selected theorems in Euclidean geometry. I will begin by proving theorems for the class for a few days, after which you will work in small groups to prove theorems yourselves to share with your classmates. Most of this group work will take place outside of class. During class, groups will be randomly called to the board to share their proofs with the class. Presentations will be critiqued both for mathematical accuracy and communication skill. This part will take most of the quarter.

The next section of the course will involve using Geometer’s Sketchpad. You will receive instruction on the use of the software, after which you will
use the software to explore new geometric situations. You will be asked to conjecture new theorems and then prove your conjectures. We will discuss different ways people come up with conjectures and thus theorems to prove, both with and without software.

Time permitting, we will look at models for non-Euclidean geometry and the role of axiom systems in mathematics.

**Exams:** There will be a midterm exam, most likely when we complete the first part of the course but possibly part way through it. Since you will be doing the proofs yourselves, it is hard to know when this exam will be, but you will have plenty of notice. Make-up exams will only be given under extreme situations.

**Grading:** Grading in this class will be based on class participation, assessments of in-class presentations, homework, in-class exams, and the final examination. Class participation is an important part of the course and you are expected to be present every day. If you cannot attend class, please contact me as soon as possible. Assignments will be given in class during the quarter and also posted on the class web site. The grading system for this course is less rigid than for most courses, but you should find this to be to your advantage. For example, the first group to present a proof will be at a distinct disadvantage over the one who has had the opportunity to watch other groups first. While I will be recording scores for each presentation, the main objective is for you to gain a solid understanding of the material, and your grade will reflect that fact. You are welcome to come and ask me about your grade at any time.

**Groups:** By the end of the first week, you will be asked to form the groups you will be working with for the rest of the quarter. Groups should be made up of 2-3 people. When forming a group, you will be asked to give a time and place when you are able to meet with one another on a regular basis. Different group members should present each time you are called to the board to give a proof.

**Notices:** Plagiarism and cheating are serious offenses and may be punished by failure on the exam, paper, or project, failure in the course, and/or expulsion from the University.

On work that is to be done independently (i.e., exams), any consultation with another student, including glancing at another paper, constitutes cheating and will be treated as such. In other situations you are permitted, even required, to discuss with one another and refer to other sources, unless otherwise instructed.

Any student with a disability who needs an accommodation or other assistance in this course should speak with me as soon as possible.