MATH 530  Geometries for Teachers

Summer, 2011  (June 13 – 17, July 15 on-line day)
meets 9:00 – 12:00 and 1:00 – 4:00 in room 305/306 of the Math Building.

Teachers:  Jim Hirstein  
MA 304  
phone: 243-2661  
hirsteinj@mso.umt.edu

Course description:

The main purpose of this course is to explore the content of geometry from multiple perspectives (proof, properties, transformations), its place in the 5-12 mathematics curriculum (beyond geometry per se), and techniques for teaching geometry (exploration, conjecture, justification, the use of technology).

This includes three responsibilities:

1. Participants will gain familiarity and depth with a variety of mathematical presentation and computer software packages that can be used to engage their students in investigations and problem explorations of geometry topics.
2. Participants will consider national and international student performance of middle- to high-school aged students on geometry items in order to gain a perspective about the importance of these topics in the mathematics curriculum.
3. Participants will organize classroom presentations and develop units of instructional material that could be used with their students.

Text and resources:

The NCTM's Navigation Series on Geometry (four modules: K-2, 3-5, 6-8, 9-12).  
The NCTM's Navigation Series on Measurement (four modules: K-2, 3-5, 6-8, 9-12).  

Topic outline:

1. some extended Euclidean geometry,  
2. geometric figures, areas, and volumes (in 2 and 3 dimensions),  
3. similarity and its applications, and  
4. geometric transformations (rigid motions and vector representations).

Projects / Course Requirements:

There will be three assessment events:

1. Two quizzes, one over traditional geometry topics and one over transformations.  
2. one short report, which will include a presentation and a written page about a geometry teaching activity that you found or created. The most important feature of the short report is that it communicates some geometry that you have done and can share with others.  
3. A plan for an instructional unit. This will be a collection of material that could be used by your students to develop a geometrical idea. A unit should have specific goals for teaching a selected geometry topic (or topics).