

MATHEMATICS 460: GEOMETRY

Summer 2009, 1st. session

Instructor: Dr. Alex Freire, freire@math.utk.edu, 974-4313

THIS COURSE WILL HAVE TWO ‘TRACKS’:

Mathematics Education Track: For students whose main interest is in mathematics teaching at the high school level. The topics covered emphasize aspects of Euclidean geometry that may be useful in the classroom, and their connections with more advanced material. First-year calculus and a little matrix algebra may be used on occasion, but not in a major way.

Topics include: Points and lines connected with triangles and circles/transformations of the plane/conic sections/inversions and hyperbolic geometry/introduction to projective geometry.

References: 1. *Geometry Revisited*, by Coxeter and Greitzer (MAA);
2. *Elementary Geometry*, by Agricola and Friedrich (AMS).

Mathematics track: For students whose current interest is pursuing mathematics at the graduate level. Topics in this track will be chosen according to the students’ background and interests. **Prior exposure to differential geometry is not a prerequisite.** Possible topics:

Curves and surfaces moving by curvature flow.

Topics in classical differential geometry (LNM 1000, H.Hopf).

Homogeneous relativistic cosmologies and dynamical systems.

How will this work? Any student enrolled in the course is free to participate in either track, or in both. The lectures will deal with the education-track material, with grading based on problem sets. The mathematics track will function as a reading course, with students meeting with the instructor twice a week for discussion of the material. The course can be taken for *honors credit* under the ‘honors by contract’ framework (suitable projects will be offered.)

QUESTIONS? Feel free to contact me (by May 17) if you think you may be interested in the course.