MATH 420 – Geometry

Course Description from Bulletin: The course is focused on selected topics related to fundamental ideas and methods of Euclidean geometry, non-Euclidean geometry, and differential geometry <u>in two and three dimensions</u> and their applications with emphasis on various problem-solving strategies, geometric proof, visualization, and interrelation of different areas of mathematics. (3-0-3)

Enrollment: Elective for Mathematics Education, Applied Mathematics, and other majors. To be cross-listed with MSED 520.

Textbook(s): Robin Hartshorne (2000), *Geometry: Euclid and Beyond*, Springer-Verlag (ISBN 0-387-98650-2)
Andrew Pressley (2001), *Elementary Differential Geometry*, Springer Undergraduate Mathematics Series (ISBN 1-852-33152-6)
Benjamin Bold (1982), *Famous Problems of Geometry and How to Solve Them*, Dover Publications (ISBN 0-486-24297-8)
International mathematics Olympiads problem books and other geometry topics in Euclidean three dimensions

2. Students will develop various problem solving approaches and strategies emphasizing multi-level geometric reasoning.
3. Students will use formal axiomatic systems to construct and analyze proofs.
4. Students will be provided with visual interpretations of the results.
5. Students will be provided with non-trivial connections with the pre-college geometric concepts from an advanced viewpoint.
6. Students will practice their technical writing skills.

Lecture schedule: 1 150 minute (or 2 75 minute) lectures per week

Course Outline: