

Math 2160 – Geometry for Middle School Teachers

Schedule: Fall, Spring, 3 semester hours

Course Description: Informal geometry in two- and three-dimensions. Measurement. Symmetry. Transformational geometry. Tessellations. Congruence and similarity. Coordinate geometry. Constructions. Conic sections. Geometer's Sketchpad. Open only to education majors.

Prerequisite: satisfactory placement exam score.

Required Text: O'Daffer, P., Clemens, S. (1992). Geometry: An Investigative Approach, Second Edition. Addison-Wesley.

Required Materials: A compass is required for Math 2160. You will be allowed to use your compass on all quizzes and exams where a compass is needed (including the final exam).

Topic list:

1. Points, lines, planes
2. Triangles, sum of interior angles, kinds of triangles
3. Quadrilaterals, sum of interior angles, kinds of quadrilaterals
4. Polygons, sum of interior angles, convex/concave
5. Regular polygons, individual angles
6. Tiling—regular and semi-regular
7. Congruence transformations, coordinate definitions, matrix representations, composition of congruence transformations
8. Symmetry
9. Area
10. Proofs of the Pythagorean Theorem
11. Similarity
12. Compass constructions
12. Three-dimensional shapes—including spheres, cylinders, and cones
13. Polyhedra—prisms, pyramids, regular polyhedra, semi-regular polyhedra
14. Euler's formula
15. Rotational symmetry of regular polyhedra
16. Surface area and volume
17. Use of geometry software—e.g., Geometer's sketchpad, LOGO