

Course Outline for MATH 3483, Mathematics for Elementary Teaching III

MATH 3483 Mathematics for Elementary Teaching III (3 units)

Prerequisite: [MATH 3482](#) with a grade of C- or better.

Introduction to measurement, congruence and similarity, transformational geometry, polygons and polyhedra. 3 lectures.

Course Learning Objectives	
1	Draw, identify, and define a variety of common two- and three-dimensional objects.
2	Describe attributes of two-dimensional objects (area, perimeter, sides, vertices) and three-dimensional objects (surface area, volume, edges, vertices, faces).
3	Derive standard formulas for area, perimeter, surface area and volume as well as describe common misconceptions associated with standard formulas.
4	Identify similar and congruent figures and describe how similar figures relate in terms of area, surface area, perimeter, and volume.
5	Identify rotation and reflection symmetries of a given object and provide examples with specific symmetries.
6	Formally define translation, rotation, reflection, glide reflection and dilation and solve problems that require these transformations.
7	State the Pythagorean Theorem and its converse as well as produce at least one proof of the theorem.
8	Measure and estimate time, length, angles, perimeter, area, surface area, volume, weight, speed, and temperature in metric (SI), American, and nonstandard units including conversions between unit systems.
9	Complete basic constructions with compass and straightedge as well as with technology, including parallel lines, perpendicular lines, angles, segments, squares and equilateral triangles.

Expanded Course Content

Textbooks, materials, and/or other resources
Beckmann, S. Mathematics for Elementary and Middle School Teachers with Activities. 6th Edition, Pearson.

Week	Readings	Topics of Discussion
1	Sections 10.1, 10.2	Lines, angles and their relationship to the world
2	Sections 10.3, 10.4	Properties and classification of polygons. Properties of circles and spheres.
3	Sections 11.1, 11.2	Concepts of measurement including non-standard units, length, area and volume.
4	Sections 11.3, 11.4	Error and precision of measurement. English units and metric units as well as converting between units of measurement.
5	Sections 12.1, 12.2, 12.3	Finding areas of rectangles and triangles including justification for area formulas and problem solving related to area.
6	Sections 12.4, 12.5	Area and perimeter of parallelograms and other polygons created by points on a coordinate system. Justification for area formulas and problem solving related to area.
7	Sections 12.6, 12.8	Area and circumference of circles, pi, and the relationship between area and perimeter.
8	Section 12.9	The Pythagorean Theorem, its history, proof and related problem solving.
9	Section 13.1	Defining polyhedral and other solid shapes including properties of prisms, pyramids and cylinders. 3D visualization and drawing.
10	Section 13.2	Surface area of 3D shapes including motivation for formulas and solving real-world and mathematical problems.
11	Section 13.3	Volumes of 3D shapes including motivation for formulas and solving real-world and mathematical problems.
12	Section 14.1	Defining and problem solving with reflections, translations and reflections.
13	Sections 14.2, 14.3	Symmetry and congruence
14	Section 14.4	Geometric constructions with compass and straightedge as well as technology.
15	Sections 14.5, 14.6	Dilations and similarity and related problem solving.

Method of Assessment

The possible methods of assessment are written individual examinations, quizzes, in-class worksheets or presentations, projects, and homework. One or more midterms and a cumulative final exam are required.

Instructional Mode

The instructional mode for this class is face-to-face. This designation means that the essential academic standards of the course require in-class student engagement, and thus remote instruction is not appropriate.