Math 1312: Introduction to Math Reasoning
Course Syllabus

Section number: This information applies to ALL face-to-face sections
Delivery format: face-to-face lecture

Prerequisite: credit for or placement out of **MATH 1310** or **MATH 1311**

Textbook: *Elementary Geometry for College Students* by Alexander and Koeberlein, 5th edition

The information contained in this class outline is an abbreviated description of the course. Additional important information is contained in the departmental policies statement at http://www.math.uh.edu/~dog/13xxPolicies.doc and at your instructor's personal webpage. You are responsible for knowing all of this information.

Upon successful completion of this course, students will be able to use the basics of proving theorems and argue a point of view effectively. The topics lend themselves to learning the methods of proving an assertion. The course is designed for pre-service elementary and middle school teachers.

A student in this class is expected to complete the following assignments:
1 3 Regular Exams
2 Final Exam
3 Online Quizzes

- Quizzes 10%
- Tests 66% (22% each)
- Final Exam 24%

Total: 100%

Introduction to Mathematical Reasoning Topic List

Chapter 1 —Line and Angle Relationships

1.1 Sets, Statements and Reasoning
1.2 Informal Geometry and Measurement
1.3 Early Definitions and Postulates
1.4 Angles and Their Relationships
1.5 Introduction to Geometric Proof
1.6 Relationships: Perpendicular Lines
1.7 The Formal Proof of a Theorem

Chapter 2 — Parallel Lines

2.1 The Parallel Postulate and Special Angles
2.2 Indirect Proof
2.3 Proving Lines Parallel
2.4 The Angles of a Triangle
2.5 Convex Polygons
2.6 Symmetry and Transformations

Chapter 3 —Triangles

3.1 Congruent Triangles
3.2 Corresponding Parts of Congruent Triangles
3.3 Isosceles Triangles
3.4 Basic Constructions Justified
3.5 Inequalities in a Triangle

Chapter 4 — Quadrilaterals

4.1 Properties of a Parallelogram
4.2 The Parallelogram and Kite
4.3 The Rectangle, Square and Rhombus
4.4 The Trapezoid

Chapter 5 — Similar Triangles

5.1 Ratios, Rates and Proportions
5.2 Similar Polygons
5.3 Proving Triangles Similar
5.4 Pythagorean Theorem
5.5 Special Right Triangles
5.6 Segments Divided Proportionally

Chapter 6 — Circles

6.1 Circles and Related Segments and Angles
6.2 More Angle measures in a Circle
6.3 Line and Segment Relationships in the Circle
6.4 Some Constructions and Inequalities for the Circle

Chapter 8 — Areas of Polygons and Circles

8.1 Area and Initial Postulates
8.2 Perimeter and Area of Polygons
8.3 Regular Polygons and Area
8.4 Circumference and Area of a Circle
8.5 More Area Relationships in the Circle

Chapter 9 — Surfaces and Solids

9.1 Prisms, Area and Volume
9.2 Pyramids, Area and Volume
9.3 Cylinders and Cones
9.4 Polyhedrons and Spheres