



**Catalog Description:**

This is one of two independent courses which follow “Measurement and Geometry for Teachers” (Math 1136) to provide necessary content for middle grade teachers. This course focuses on functions and calculus, including modern and historical perspectives.

**Prerequisite:**

A grade of C- or above in “Measurement and Geometry for Teachers” (Math 1136). A grade of C- or above in Math 1149 or 1150, or credit for 150, or math placement level L.

**Text:**

*Calculus*, by Frank Morgan, CreateSpace Independent Publishing Platform, ISBN 9781478356882

Purpose:

This course serves to introduce students to the key ideas of calculus and to important historical developments in the subject. A thorough introduction to functions as mappings is given, and the trigonometric functions are used throughout the course as a key example of functions not given by algebraic expressions.

The essential concepts of limit, derivative, integral, and the fundamental theorem are emphasized, together with core applications. An introduction to Taylor series, especially the Taylor expansions for sine and cosine, completes the class.

Topics List:

1. Functions
2. Elementary approach to how functions change
3. Defining rate of change
4. Concept of limit
5. Derivatives
6. Interpretations of first and second derivatives
7. Sine, cosine and logarithm functions
8. Product rule and chain rule
9. Applications of derivatives
10. Antiderivatives
11. Riemann sums
12. Fundamental theorem of calculus
13. Applications of integration
14. Taylor approximations, infinite sequences
15. Series