



Catalog Description:

Language, representations, informal and formal calculations, and applications of instantaneous rates and accumulation through derivatives and integrals.

Prerequisite:

A grade of C- or above in 1165, or credit for 1164 or 110; and enrollment in Middle Childhood Education major with Math as area of concentration. Not open to students with credit for 111.

Text:

No text required. The course will consist of group activities and subsequent whole class discussions.

Purpose: The purpose of the course is to prepare teachers of middle school students. It intends to deepen and extend the prospective teachers' content knowledge of the mathematics they will teach as well as their ability to reason with and communicate that knowledge. In particular, the course will introduce these students to the derivative and definite integral of single-variable functions. Concepts of the middle school curriculum will serve as a springboard for developing the rate of change and slope as a conceptual model for the derivative as well as net change and area as a conceptual model for the definite integral. Emphasis will be placed on using these concepts to model and solve problems. Algebraic, graphical, and tabular representations of these ideas will be used.

Topics List:

1. Rates described pictorially, in writing, and with symbols.
2. Informal and formal measurement of (instantaneous) rates and their connection to middle school mathematics.
3. Informal and formal measurement of (accumulate) area and their connection to middle school mathematics.
4. The Fundamental theorem of Calculus.
5. Applications of differential calculus.
6. Applications of integral calculus.

Follow-up Courses:

Math 2168: History of Mathematics for Middle School Teachers