Course Outline

Department of Mathematics
and Statistics

Minnesota State University, Mankato

Math 121   Calculus I (4 semester hours)

Course Description:

Limits, continuity, the derivative and its applications, and the integral and its applications.

Prerequisites: Scoring 16 or better on the Functions and Graphs Placement Test with 6 or better on Trigonometry, or scoring 22 or better on the ACT Math Subscore, or Math 112 and Math 113 with C or better, or Math 115 with C or better.

Learning Outcomes

Students will learn the definition of the derivative of a function, the antiderivative of a function, and the definite integral of a function over an interval. They will master the relevant computations and apply both theory and computation to solve problems of the real world.

Content Outline:

1. Limits and continuity
2. The derivative of a function at a point and the derivative function
3. Applications of the derivative function to curve sketching, related rate problems, optimization problems, and limit computations (L'Hospital's Rule)
4. The antiderivative of a function and application to motion and other rate problems
5. Riemann sums and the definite integral of a function over an interval
6. Applications of the definite integral
7. The Fundamental Theorem of Calculus
8. The subsitution rule for integration

Textbook:

Essential Calculus (Early Transcendentals), James Stewart, Brooks/Cole.