MA 125 Calculus I

Syllabus*

Course Description

The course provides an introduction to calculus with emphasis on differential calculus. Topics include limits of functions, derivatives of elementary functions, application of differentiation to curve sketching and optimization problems, and examples in the natural sciences and economics. The course concludes with an introduction to definite integrals and the fundamental theorem of calculus. *Credit for both MA 120 and MA 125 is not allowed.*

Prerequisites

MA 113 or MA 115 or placement test score of 85 or more.

Textbook

Jon Rogawski, *Calculus: Early Transcendentals*, W. H. Freeman, New York, 1st edition (2008). ISBN-13: 978-1-4292-1073-7

Topics & Time Distribution

By assuming the total of 13 weeks, the instructor is given an extra week and a half to use for tests, emphasis on certain topics, etc.

Chapter 1:	Precalculus Review	1 week
Chapter 2:	Limits	3 wks
Chapter 3:	Differentiation	4 wks
Chapter 4:	Applications of the Derivative	3 wks
Chapter 5:	The Integral	1.5 wks

Detailed Schedule

Below are the essential sections which should be covered by all instructors.

Chapter 1: 1.4, 1.5, 1.6.

Chapter 2: 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8.

Chapter 3: 3.1, 3.2, 3.3, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11.

Chapter 4: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.9.

Chapter 5: 5.1, 5.2, 5.3, 5.4.

*Last updated April 28, 2010

Learning Objectives:

Upon the successful completion of the course a student will:

1) be able to analyze elementary functions with regard to their critical behavior, regions of increase and decrease, concavity properties and asymptotic behavior and sketch a graph based on these observations;

2) have a deep understanding (both conceptual and computational) of the idea of a limit;

3) possess the skills necessary to understand, interpret, and compute the derivative as a rate of change, as a slope, as a linear approximation, and as a tool for optimization problems;

4) be able to compute simple anti-derivatives;

5) be able to estimate an area under a curve and a definite integral using Riemann sums; interpret definite integral as a signed area;

6) be able to state and prove results about limits, derivatives, mean values; to state and use the fundamental theorem of calculus.