

**Day-by-day summary of course**

**Unit 1: (9/23 to 10/28)** Describing phenomena using graphs, numbers, words and symbols. Making predictions and answering questions using mathematical analysis when the phenomena is described by a function. The main objectives of this unit are to develop a thorough knowledge of the concept of “function,” the representations of functions and the features of linear, exponential, power, logarithmic and polynomial functions.

**Unit 2: (10/30 to 11/4)** The concept of a limiting value - a tool for making mathematical sense of “infinitely large” and “infinitesimally small.” The main objectives of this unit are to appreciate that some functions are not defined at all points, and how to describe this situation mathematically.

**Unit 3: (11/6 to 12/13)** Making sense of the idea of an “instantaneous rate of change.” Calculating the instantaneous rates of change of quantities and phenomena described by functions. Applications of the derivative such as optimization and related rates.

**Unit 4: (12/16 to 12/18)** Approximating the value of a function when all that you know is the rate of change and the value of the function at a single point.

Day	Date	Topic
Monday	9/23/02	First day of class. Quantitative relationships and making predictions.
Wednesday	9/25/02	Definition and representations of functions. Recognizing functions.
Friday	9/27/02	Interpreting graphs of functions. Average rate of change.
Labs:	9/24/02	NO LAB.
	9/26/02	NO LAB.
Monday	9/30/02	Linear functions. Modeling data using linear functions.
Wednesday	10/2/02	Exponential growth and exponential functions. Exponential regression.
Friday	10/4/02	Power functions. Vertical and horizontal asymptotes.
Labs:	10/1/02	How the brain counts: Linear and exponential regression.
	10/3/02	Gateway #1: Fundamental rules of algebra.
Monday	10/7/02	Rates of change and concavity.
Wednesday	10/9/02	Interpreting and using function notation.
Friday	10/11/02	Combining functions 1: Arithmetic and composition.
Labs:	10/8/02	Newton’s Law of Cooling and Ebbinghaus’ Law of Forgetting.
	10/10/02	Newton’s Law of Cooling and Ebbinghaus’ Law of Forgetting.
Monday	10/14/02	NO CLASS - COLUMBUS DAY.
Wednesday	10/16/02	Combining functions 2: Transformations of functions.
Friday	10/18/02	The concept of the inverse of a function.
Labs:	10/15/02	Describing and analyzing biomedical data.
	10/17/02	Describing and analyzing biomedical data.
Monday	10/21/02	Solving exponential equations using logarithms.
Wednesday	10/23/02	Using transformations to understand quadratic functions.
Friday	10/25/02	Functions defined in pieces.
Labs:	10/22/02	The long term impact of human activity on marine ecosystems.
	10/24/02	The long term impact of human activity on marine ecosystems.

Monday	10/28/02	The idea of a limiting value. Left and right hand limits.
Wednesday	10/30/02	Review for Exam 1.

**EXAM 1: WEDNESDAY 10/30 7-9PM SCIENCE CENTER LECTURE HALL D**

Friday	11/1/02	Calculating limits of functions.
Labs:	10/29/02	Optional Lab: Review for Exam 1.
	10/31/02	NO LAB.

Monday	11/4/02	Rational functions, asymptotes and limits involving infinity.
Wednesday	11/6/02	Average and instantaneous rate. Sketching the graph of a derivative.
Friday	11/8/02	Calculating derivatives using limits.
Labs:	11/5/02	World population growth and sustainable development.
	11/7/02	World population growth and sustainable development.

Monday	11/11/02	VETERANS' DAY – NO CLASS.
Wednesday	11/13/02	Graphical and verbal interpretations of the derivative.
Friday	11/15/02	Using derivatives to understand the shapes of polynomial graphs.
Labs:	11/12/02	Distance, velocity and acceleration.
	11/14/02	Gateway #2: Concepts of Derivatives.

Monday	11/18/02	Short-cut rules for calculating derivatives.
Wednesday	11/20/02	The product and quotient rules.
Friday	11/22/02	Derivatives of exponential and logarithmic functions.
Labs:	11/19/02	Can anybody ever win the War on Drugs?
	11/21/02	Can anybody ever win the War on Drugs?

Monday	11/25/02	Locating the maximum, minimum values of a function.
Wednesday	11/27/02	Modeling situations with functions. Optimization.
Friday	11/29/02	NO CLASS - THANKSGIVING BREAK.
Labs:	11/26/02	Optional lab: Gateway make-up opportunity.
	11/28/02	NO LAB - THANKSGIVING BREAK.

Monday	12/2/02	Review for Exam 2.
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**EXAM 2: TUESDAY 12/3 7-9PM SCIENCE CENTER LECTURE HALL D**

Wednesday	12/4/02	Modeling situations with functions. Optimization.
Friday	12/6/02	Optimization. The second derivative test.
Labs:	12/3/02	Optional lab: Review for Exam 2.
	12/5/02	Optional lab: Gateway make-up opportunity.

Monday	12/9/02	The Chain Rule for derivatives.
Wednesday	12/11/02	Applications of the Chain Rule: Related rates.
Friday	12/13/02	Related rates and implicit differentiation.
Labs:	12/10/02	How long will the Earth's natural resources last?
	12/12/02	Gateway #3: Calculating derivatives.

Monday	12/16/02	Estimating quantities based on the rate of change.
Wednesday	12/18/02	Slope fields and graphical analysis of differential equations.
Friday	12/20/02	NO CLASS.
Labs:	12/17/02	Optional lab: Gateway make-up opportunity.
	12/19/02	NO LAB.