University at Buffalo
Department of Mathematics
Office of Undergraduate Studies
233 Mathematics Building
E-mail: math-undergrad@buffalo.edu
Ph: (716) 645-8785

SAMPLE SYLLABUS
This document is published only as an indication of what is typically taught in this course. Instructors have the responsibility of deciding on the topics to be omitted, additional topics to be included, and the emphasis, ordering, and pacing of presentation of topics.

MTH 136: College Calculus 1A

Number of Course Credits: 2

Course Description

This half-semester course comprises the first half of MTH 141.
MTH 136 and MTH 137 together are equivalent to MTH 141.

Required Text(s) & Materials

Calculus: Early Transcendentals, Ninth Edition, James Stewart, Daniel Clegg, Saleem Watson.

Prerequisites

Score of 70 or better on all three components of the Math Readiness Assessment (exam results are valid for one year), or a C or better in ULC148, MTH 108, MTH 114, MTH 115, MTH 121, MTH 131, or D or better in MTH 141, or score of 3 or better on AP Calculus, or concurrent registration in MTH 109 with either C or better in MTH 113 or MRA scores 70+ in Math Fundamentals and 50-69 in Trigonometry and Geometry.

Notes

This half-semester course comprises the first half of MTH 141. MTH 136 covers the derivative and differentiation with applications. MTH 136 and MTH 137 together are equivalent to MTH 141. If you are following the suggested schedule described below remember not to assign problems on log, exp, and inverse trigonometric functions in sections 2.5, 2.7, and 2.8, since these functions are covered only later in the course.

Learning Outcomes

Outcome (Student will be able to...)	Method of Assessment
- Define the limit of a function at a point - Evaluate limits using the definition and using algebraic properties of limits - Evaluate limits of functions at infinity and interpret them as horizontal asymptotes - Define continuity and determine whether or not a function is continuous at a point and on an interval - Define derivative and interpret it as the slope of a tangent to the graph of a function	HW 1, 2, 3 Exam 1
- Recognize exponential, logarithmic, and inverse trigonometric functions, sketch their graphs and use their basic properties in computations - Compute derivatives of polynomial, exponential, logarithmic, trigonometric, and inverse trigonometric functions - Compute derivatives using derivative rules, including the chain rule and implicit differentiation - Use derivatives to compute linear approximations of functions	HW 4, 5, 6 Exam 2
- Choose appropriate methods or models for a given problem, using information from observation or knowledge of the system being studied.	HW 1, HW 2, HW 3, HW 4, HW 5, HW 6, Exam 1, Exam 2
- Employ quantitative methods, mathematical models, statistics, and/or logic to analyze data and solve real-world problems beyond the level of basic algebra.	HW 1, HW 2, HW 3, HW 4, HW 5, HW 6, Exam 1, Exam 2
- Identify common mistakes and/or limitations in a.) empirical and/or deductive reasoning, and b.) mathematical, quantitative, and/or logical problem solving.	HW 1, HW 2, HW 3, HW 4, HW 5, HW 6, Exam 1, Exam 2
- Interpret mathematical models, formulas, graphs, and/or tables, to draw inferences from them, and explain these inferences.	HW 1, HW 2, HW 3, HW 4, HW 5, HW 6, Exam 1, Exam 2

Course Schedule

Week	Sections	Topics	Exams
1	2.1, 2.2, 2.3	The tangent and velocity problems. Limit of a function. Calculating limits using limit laws.	
2	2.4, 2.5	The precise definition of a limit. Continuity.	
3	2.6, 2.7	Limits at infinity; horizontal asymptotes. Derivatives and rates of change.	
4	2.8, 1.4, 1.5	The derivative as a function. Inverse functions and logarithms. Inverse trigonometric functions. Exponential functions.	Exam 1
5	3.1, 3.2, 3.3	Derivatives of polynomials and exponential functions. The product and quotient rules. Derivatives of trigonometric functions.	
6	3.4, 3.5, 3.6	The chain rule. Implicit differentiation. Derivatives of logarithmic and inverse trigonometric functions.	
7	3.8, 3.10	Exponential growth and decay. Linear approximation and differentials.	Exam 2

Exam Schedule

Date	Subject
Week 4	Exam 1
Week 7	Exam 2