University at Buffalo
The State University of New York

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Course Number:	**MTH 131**
Course Title:	**Mathematical Analysis for Management**
Credit Hours:	**4**
Textbook:	**R. Barnett, M. Ziegler, K. Byleen, *Calculus for Business, Economics, Life Sciences and Social Sciences, 4th* custom UB edition.**
	4th custom UB edition consists of the first 7 chapters of the standard 14th edition.
	Note: All new textbooks come with a PIN for MyMathLab online course management and homework system. Please ask the undergraduate director if you need MyMathLab training or assistance.
Prerequisites:	NYS Regents Course B, or ULC 148, or MTH 115.
Notes:	MTH 131 is a one-semester terminal course for students of the School of Management.
	Instructors should emphasize business and economics examples and problems and bypass those involving life and physical sciences.

This schedule is written for 13 weeks of instruction. In a typical semester there are 14 teaching weeks, thus some flexibility is built in.

Week	Sections	Topics
1	1.1-1.4	Functions. Linear and quadratic functions. Polynomial and rational functions.
2	1.5, 1.6	Exponential and logarithmic functions.
3	2.1-2.5	Limits and continuity. Basic differentiation.
4	2.6-2.7	Differentials. Marginal analysis in business and economics. **Midterm Exam 1**
5	3.1-3.2	The number "e" and continuous compounding. Derivatives of exponentials and logarithms.
6	3.3-3.4	The product, quotient and chain rule for derivatives.
7	3.5-3.7	Implicit differentiation and related rates. Elasticity of demand.
8	4.1-4.4	Increasing and decreasing functions. Curve sketching using derivatives. L'Hopital's rule.
9	4.5-4.6	Optimization **Midterm Exam 2**
10	7.1-7.4	Functions of several variables. Partial derivatives. Maxima and Minima. Lagrange Multipliers.
11	5.1-5.3	Antiderivatives and indefinite integrals. Integration by substitution. Differential equations.
12	5.4-5.5 6.1-6.2	Definite integrals and the fundamental theorem of calculus. Applications of definite integrals.
13	6.3, 6.4	Integration by Parts. Integration tables.

Student Learning Outcomes for
MTH 131 Mathematical Analysis for Management

Assessment measures: weekly homework assignments, 2 midterm exams, final exam.

At the end of this course a student will be able to:	Assessment
recognize polynomial, rational, exponential and logarithmic functions, understand their basic properties and know how to evaluate them	HW #1, 2 Midterm 1 Final Exam
compute limits of algebraic functions graphically, numerically, and algebraically	HW #3 Midterm 1 Final Exam
– interpret the derivative graphically and as a rate of change in business applications – demonstrate the understanding of the derivative in marginal function analysis by finding marginal cost, marginal revenue, and marginal profit at different levels of production	HW #4 Midterm 1 Final Exam
– compute the first and higher order derivatives of basic algebraic, exponential, and logarithmic functions using derivative rules, including the chain rule and implicit differentiation	HW #5, 6, 7 Midterm 2 Final Exam
– use limits and derivatives to construct, analyze, and interpret the graph of a function	HW #8 Midterm 2 Final Exam
– use derivatives to analyze and solve applied optimization problems, for instance optimizing cost, revenue and profit in business applications	HW #9 Midterm 2 Final Exam
– compute partial derivatives of functions of more than one variable, and interpret these in economic applications. – solve basic optimization problems for functions of two variables using the second derivative test	HW #10 Midterm 2 Final Exam
– compute indefinite and definite integrals of functions using anti-derivative rules and the fundamental theorem of calculus – compute indefinite integrals using integration techniques including substitution, tables, and integration by parts – represent area as a definite integral and interpret the result in business applications	HW #11, 12 Final Exam
– Choose appropriate methods or models for a given problem, using information from observed or deduced data and knowledge of the system being studied. – Employ quantitative methods, mathematical models, statistics, and/or logic to solve real-world problems beyond the level of basic algebra. – Identify common mistakes and/or limitations in empirical and deductive reasoning, and in mathematical, quantitative, and/or logical problem solving. – Interpret mathematical models, formulas, graphs, and/or tables, to draw inferences from them, and explain these inferences.	HW #1-12, Midterm 1 Midterm 2 Final Exam