

## Course Orientation and Organization: Basic Calculus

**Text:** *Brief Applied Calculus*, Fourth Edition, by Berresford, Rockett  
Special Edition Customized for BGSU, ISBN 0-618-81245-8

**Equipment:** Graphing Calculator, preferably a TI-83 or TI-84. Other graphing calculators are allowed, but the instructor is only responsible for teaching the use of the TI-83 or TI-84. Please seek the instructor's permission if using a calculator other than the TI-83 or TI-84.

**Course Description:** Basic Calculus is a five credit hour course including differential and integral calculus with applications, multivariate differential calculus and matrix theory with applications.

**Prerequisites:** A grade of C or higher in MATH 1200, MATH 1220, MATH 1280, or MATH 1300; or two years of high school algebra and one of geometry AND a satisfactory placement exam score. Students not meeting the prerequisites of the course will be dropped from the course. Not open to students with a grade of C or higher in MATH 1310 or MATH 1350.

### Detailed content:

#### Chapter One: Functions

- 1.1 Real Numbers, Inequalities, and Lines
- 1.2 Exponents
- 1.3 Functions
- 1.4 Functions, continued

#### Supplemental Appendix A: Algebra for Calculus Students

- A.1 Determining the Sign of a Function
- A.2 Rewriting Expressions
- A.3 Describing Behavior at Infinity

#### Chapter Two: Derivatives and their uses

- 2.1 Limits and Continuity
- 2.2 Rate of Change, Slopes, and Derivatives
- 2.3 Some Differentiation Formulas
- 2.4 The Product and Quotient Rules
- 2.5 Higher-Order Derivatives
- 2.6 The Chain Rule and the Generalized Power Rule
- 2.7 Non-differentiable Functions

#### Chapter Three: Further Applications of Derivatives

- 3.1 Graphing Using the First Derivative
- 3.2 Graphing Using the First and Second Derivatives
- 3.3 Optimization
- 3.4 Further Applications of Optimizations
- 3.5 Optimizing Lot Size
- 3.6 Implicit Differentiation and Related Rates

#### Chapter Four: Exponential and Logarithmic Functions

- 4.1 Exponential Functions

- 4.2 Logarithmic Functions
- 4.3 Differentiation of Logarithmic and Exponential Functions
- 4.4 Two Applications to Economics: Relative Rates and Elasticity of Demand

Chapter Five: Integration and Its Applications

- 5.1 Antiderivatives and Indefinite Integrals
- 5.2 Integration Using Logarithmic and Exponential Functions
- 5.3 Definite Integrals and Areas
- 5.4 Further Applications of Definite Integrals: Average Value and Area Between Two Curves
- 5.5 Two Applications to Economics: Consumers' Surplus and Producers' Surplus
- 5.6 Integration by substitution

Supplemental Chapter 6: Systems of Equations

- Sup 6.1 Linear Systems of Equations
- Sup 6.2 Two-Variable Linear Systems
- Sup 6.3 Multivariable Linear Systems

Supplemental Chapter 7: Matrices and Determinants

- Sup 7.1 Matrices and Systems of Equations
- Sup 7.2 Operations with Matrices
- Sup 7.3 The Inverse of a Square Matrix
- Sup 7.4 The Determinant of a Square Matrix
- Sup 7.5 Applications of Matrices and Determinants

<b>Grading:</b>	Exam 0	40	pts
	4 semester hour exams @ 100 pts each	400	pts
	1 Comprehensive Calculus Exam (CCE)	150	pts
	Instructor allocation for quizzes, homework, etc.	<u>160</u>	<u>pts</u>
	Total points	750	pts

The standard grading scale of A-90%, B-80%, etc. will be used unless announced otherwise in class. At the end of the semester, I will look at your total points to determine your grade. This means that if you want a(n):

- A**, you need  $(.9)(750) = 675$  points out of 750.
- B**, you need  $(.8)(750) = 600$  points out of 750.
- C**, you need  $(.7)(750) = 525$  points out of 750.
- D**, you need  $(.6)(750) = 450$  points out of 750.

**Additional Resources:** The Math and Stats Tutoring Center provides a variety of resources, including books, videos, old tests, and tutors. Please stop by and check them out at 208 Moseley Hall. You can also find them on the web at <http://www.bgsu.edu/offices/acen/mathlab>.

The Student Solutions Manual will be available on reserve in the Ogg Science Library (third floor, MSC building). This manual contains solutions (not just answers) to the odd exercises in the textbook.

**Use of "My BGSU", BNet e-mail:** The instructors and course coordinator will be using Blackboard to provide access to various materials throughout the semester. Items posted to this website will include any review sheets, old exams, answer keys, etc.

**Note:** Do **NOT** expect exam grades to be curved in this class. Test questions should resemble the Suggested Homework Exercises assigned by the course coordinator, which will consist primarily of textbook exercises, along with some supplemental problems.