

# Common Syllabus for MATH 111

(approved by Service Committee, April 2009, QL learning outcomes added Aug 2012)

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## Applied Calculus by TAN, 10<sup>th</sup> Edition

PREREQUISITES: Math.100 or a suitable placement test.

**To Instructors:** In addition to applications from required sections, instructors are encouraged to include some applications of calculus from the optional sections.

### CHAPTER 2 FUNCTIONS, LIMITS, AND THE DERIVATIVE

- 2.1 Functions and Their Graphs
- 2.2 The Algebra of Functions
- 2.3 Functions and Mathematical Models
- 2.4 Limits
- 2.5 One – sided Limits and Continuity ..... (OPTIONAL)
- 2.6 The Derivative

### CHAPTER 3 DIFFERENTIATION

- 3.1 Basic Rules of Differentiation
- 3.2 The Product and Quotient Rules
- 3.3 The Chain Rule
- 3.4 Marginal Functions in Economics ..... (OPTIONAL)
- 3.5 Higher-Order Derivatives
- 3.6 Implicit Differentiation and Related Rates ..... (OPTIONAL)
- 3.7 Differentials ..... (OPTIONAL)

### CHAPTER 4 APPLICATIONS OF THE DERIVATIVE

- 4.1 Applications of the First Derivative
- 4.2 Applications of the Second Derivative
- 4.3 Curve Sketching
- 4.4 Optimization I.
- 4.5 Optimization II

CHAPTER 5	EXPONENTIAL AND LOGARITHMIC FUNCTIONS
5.1	Exponential Functions
5.2	Logarithmic Functions
5.3	Compound Interest ..... (OPTIONAL)
5.4	Differentiation of Exponential Functions
5.5	Differentiation of Logarithmic Functions
5.6	Exponential Functions as Mathematical Models
CHAPTER 6	INTEGRATION
6.1	Antiderivatives and the Rules of Integration
6.2	Integration by Substitution
6.3	Area and the Definite Integral
6.4	The Fundamental Theorem of Calculus
6.5	Evaluating Definite Integrals
6.6	Area between Two Curves
CHAPTER 7	ADDITIONAL TOPICS IN INTEGRATION
7.1	Integration by Parts ..... (OPTIONAL)
7.2	Integration Using Tables of Integrals ..... (OPTIONAL)
7.3	Numerical Integration..... (OPTIONAL)
7.4	Improper Integrals..... (OPTIONAL)
7.5	Applications of Calculus to Probability..... (OPTIONAL)
CHAPTER 8	CALCULUS OF SEVERAL VARIABLES
8.1	Functions of Several Variables. .... (OPTIONAL)
8.2	Partial derivatives ..... (OPTIONAL)
8.3	Maxima and Minima of Functions of Several Variables ..... (OPTIONAL)

Quantitative Literacy Learning Outcomes

- Select, analyze, and interpret appropriate numerical data used in everyday life in numerical and graphical format.
- Identify and apply appropriate strategies of quantitative problem solving in theoretical and practical applications.
- Construct a conclusion using quantitative justification.

