
ASHEVILLE-BUNCOMBE TECHNICAL COMMUNITY COLLEGE
MATHEMATICS DEPARTMENT
COMMON SYLLABUS DIRECTORY

PREFIX: MAT **NUMBER:** 271 **TITLE:** Calculus I

CONTACT HOURS: 5 **CREDIT HOURS:** 4

CCL DESCRIPTION: This course covers in depth the differential calculus portion of a three-course calculus sequence. Topics include limits, continuity, derivatives, and integrals of algebraic and transcendental functions of one variable, with applications. Upon completion, students should be able to apply differentiation and integration techniques to algebraic and transcendental functions. *This course has been approved to satisfy the Comprehensive Articulation Agreement general education core requirement in natural science/mathematics.*

PREREQUISITE: MAT 172 OR MAT 175

TEXTBOOK: Calculus Sixth Edition, By Stewart

DELIVERY METHOD: Traditional with Web Support.

GRADING POLICY: Tests – 50%
Labs – 20%
On-line Homework – 10%
Final Exam – 20%

COURSE CONTENT:

- 1.1 Four Ways to Represent a Function:
- 1.2 Mathematical Models:
- 1.3 New Functions from Old Functions:
- 1.4 Graphing Calculators and Computers:
- 1.5 Exponential Functions:
- 1.6 Inverse Functions and Logarithms:
- 2.1 The Tangent and Velocity Problems:
- 2.2 The Limit of a Function:
- 2.3 Calculating Limits Using the Limit Laws:
- 2.4 The Precise Definition of a Limit:

- 2.5 Continuity:
- 2.6 Limits at Infinity; Horizontal Asymptotes:
- 2.7 Derivatives and Rates of Change:
- 2.8 The Derivative as a Function:
- 3.1 Derivatives of Polynomials and Exponential Functions:
- 3.2 The Product and Quotient Rules:
- 3.3 Derivatives of Trigonometric Functions:
- 3.4 The Chain Rule:
- 3.5 Implicit Differentiation:
- 3.6 Derivatives of Logarithmic Functions:
- 3.7 Rates of Change in the Natural and Social Sciences
- 3.8 Exponential Growth and Decay:
- 3.9 Related Rates:
- 3.10 Linear Approximations and Differentials:
- 3.11 Hyperbolic Functions:
- 4.1 Maximum and Minimum Values:
- 4.2 The Mean Value Theorem:
- 4.3 How Derivatives Affect the Shape of a Graph:
- 4.4 Indeterminate Forms and L'Hospital's Rule:
- 4.5 Summary of Curve Sketching:
- 4.6 Graphing With Calculus and Calculators:
- 4.7 Optimization Problems:
- 4.8 Newton's Method:
- 4.9 Antiderivatives:
- 5.1 Areas and Distances:
- 5.2 The Definite Integral:
- 5.3 The Fundamental Theorem of Calculus:
- 5.4 Indefinite Integrals and the Net Change Theorem:
- 5.5 The Substitution Rule:

COMMENTS: Any policy concerning the possible acceptance of a late assignment or the possibility of a special arrangement that might be made with the student who missed a scheduled examination due to circumstances beyond his/her control is left to the discretion of the instructor.
