

SOUTHEASTERN LOUISIANA UNIVERSITY
DEPARTMENT OF MATHEMATICS
MATH 200 SYLLABUS

COURSE TITLE: Calculus I

CREDIT: 5 semester hours

PREREQUISITE: A score of 28 or above on the Mathematics section of the ACT or Math 165.

CATALOGUE DESCRIPTION: The first of a standard three-course sequence on the foundations of differential and integral calculus. Topics include limits, the derivatives, techniques of differentiation, applications of the derivative, antiderivatives, definite integrals, and the calculus of transcendental functions.

COURSE OVERVIEW:

This is a beginning Calculus course for Mathematics, Mathematics Education, Physics, Chemistry, Computer Science, and Pre-Engineering majors. Topics include limits, derivative, rules of differentiation (sum, product, quotient, and chain rules), integration, definite integrals, Riemann sums, area, exponential and logarithmic functions, and inverse trigonometric functions. These topics can be found in Chapters 1–6 of the text.

TEXT: *Calculus of a Single Variable*, 9th Edition by Larson and Edwards

PUBLISHER: Brooks/Cole

TOPICS COVERED: Based upon the current textbook, the following outline allows for 5 regular examinations and the final examination. The section numbers from the textbook are given in parentheses after each topic:

Limits and Their Properties: (2 Weeks – Chapter 1)

- A Preview of Calculus (1.1)
- Finding Limits Graphically and Numerically (1.2)
- Evaluating Limits Analytically (1.3)
- Continuity and One-Sided Limits (1.4)
- Infinite Limits (1.5)

Differentiation (3 Weeks – Chapter 2)

- The Derivative and the Tangent Line Problem (2.1)
- Basic Differentiation Rules and Rates of Change (2.2)
- The Product and Quotient Rules and Higher-Order Derivatives (2.3)
- The Chain Rule (2.4)
- Implicit Differentiation (2.5)
- Related Rates (2.6)

Application of Differentiation (3.5 Weeks – Chapter 3)

- Extrema on an Interval (3.1)
- Rolle's Theorem and the Mean Value Theorem (3.2)
- Increasing and Decreasing Functions and the First Derivative Test (3.3)
- Concavity and the Second Derivative Test (3.4)
- Limits at Infinity (3.5)
- A Summary of Curve Sketching (3.6)
- Optimization Problems (3.7)
- Newton's Method (3.8)
- Differentials (3.9)

Integration (3.5 Weeks – Chapter 4)

- Antiderivatives and Indefinite Integration (4.1)
- Area (4.2)
- Riemann Sums and Definite Integrals (4.3)
- The Fundamental Theorem of Calculus (4.4)
- Integration by Substitution (4.5)
- Numerical Integration (4.6)

Logarithmic, Exponential, & Other Transcendental Functions (2.5 Weeks – Chapter 5)

- The Natural Logarithmic Function and Differentiation (5.1)
- The Natural Logarithmic Function and Integration (5.2)
- Inverse Functions (5.3)
- Exponential Functions: Differentiations and Integration (5.4)
- Bases Other than e and Applications (5.5)
- Inverse Trigonometric Functions and Differentiation (5.6)
- Inverse Trigonometric Functions and Integration (5.7)
- Hyperbolic Functions (5.8)

Differential Equations (0.5 Week – Chapter 6)

Differential Equations: Growth and Decay (6.2)

Separation of Variables and the Logistic Equation (6.3)

EMAIL REQUIREMENT: All correspondence will be made through students' Southeastern email accounts.

DISABILITY ACCESS STATEMENT: If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self-identify with the Office of Disability Services, Room 203, Student Union. No accommodations will be granted without documentation from the Office of Disability Services.

ACADEMIC INTEGRITY: Students are expected to maintain the highest standards of academic integrity. Behavior that violates these standards is not acceptable. Examples include the use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student, and similar behavior that defeats the intent of an examination or other class work.