SOUTHEASTERN LOUISIANA UNIVERSITY
DEPARTMENT OF MATHEMATICS
MATH 200 COURSE INFORMATION SHEET

Effective August 2017

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 derivative, techniques of differentiation, applications of the derivative, antiderivatives, definite integrals, the calculus of transcendental functions, and applications of integration.

COURSE OVERVIEW:

This is a beginning Calculus course for Mathematics, Mathematics Education, Physics, Chemistry, Computer Science, Engineering Technology, and Pre-Engineering majors. Topics include limits, derivative, rules of differentiation (sum, product, quotient, and chain rules), integration, definite integrals, Riemann sums, area, the calculus of exponential, logarithmic, and inverse trigonometric functions, and applications of the derivative and integral. These topics can be found in Chapters 1— 7 of the text.

TEXT: *Calculus of a Single Variable*, 11th Edition by Larson and Edwards **PUBLISHER:** Cengage Learning

ESSENTIAL TOPICS COVERED: Based upon the current textbook, the following outline allows for 4–5 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)

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)

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)
- Exponential Functions: Differentiations and Integration (5.4)
- Bases Other than e and Applications (5.5)
- Inverse Trigonometric Functions and Differentiation (5.7)
- Inverse Trigonometric Functions and Integration (5.8)

Applications of Integration (1.5 Weeks – Chapter 7)
- Area of a Region between Two Curves (7.1)
- Volume: The Disk Method (7.2)
- Volume: The Shell Method (7.3)
- Work (7.5)

OPTIONAL TOPICS: If time permits, some of the following sections may be covered

Newton's Method (3.8)
Differentials (3.9)
Numerical Integration (8.6; note that if you cover any of this, you will need to use simplified problems)
Inverse Functions (5.3)
Hyperbolic Functions (5.9)
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.