MATHEMATICS 251
CALCULUS I (4)
(EFFECTIVE FALL 2011)

PREREQUISITE: Two units of high school algebra, one unit of high school geometry, one-half unit of high school trigonometry and appropriate mathematics placement result OR completion of Math 185.

NOTES:
1. This course requires the use of a graphing calculator. Computer algebra systems are prohibited. A TI-Nspire calculator may only be used with the TI-84 faceplate.
2. Some instructors may require a computer supplement in addition to the course text.
3. All students in this course will take the Department of Mathematics and Statistics common final exam.

CATALOG DESCRIPTION: (Applies to the Math 251-252 sequence) Limits and continuity. Derivatives and integrals of polynomial, rational, exponential, logarithmic, trigonometric, and hyperbolic functions. Techniques of integration. Conics. Parametric and polar equations. Intermediate forms and improper integrals. Infinite series, including Taylor series. Must be taken in sequence.

OBJECTIVES: The student will:
1. Understand and apply the definitions and concepts of limit and continuity of functions.
2. Understand and apply the definition of derivative, Rolle's Theorem, and Mean Value Theorem.
3. Differentiate both explicitly and implicitly algebraic, trigonometric, logarithmic, and exponential functions.
4. Apply the basic differentiation rules to complex functions.
5. Use derivatives in applications such as approximations, Newton's Method, related rates, optimization, and L'Hopistal's Rule.
6. Use derivatives to determine increasing-decreasing and concavity intervals for functions and use these results as an aid in curve sketching of these functions.
7. Use the Fundamental Theorem of Calculus in definite integral evaluation.
8. Integrate the basic functions including the use of basic substitution techniques.
9. Use integrals in applications such as areas, volumes by washer and shell methods, work, average value, arclength, surface area, and others.

TEXTBOOK: If taking Math 251-252-320:
Calculus: Early Transcendentals (7th Edition), Stewart;
ISBN-10: 053-849790-4
ISBN-13: 978-053-849790-9

OR

If taking Math 251-252 and NOT 320
Single Variable Calculus: Early Transcendentals (7th Edition), Stewart;
ISBN-10: 053-849867-6
ISBN-13: 978-053-849867-8

OR

If taking Math 251 and NOT 252 and NOT 320
Single Variable Calculus (Vol. 1): Early Transcendentals (7th Edition), Stewart;
ISBN-10: 053-849869-2
ISBN-13: 978-053-849869-2

OUTLINE:

CHAPTER	TITLE	SECTIONS	DAYS
2	Limits and Derivatives	2.1-2.8	10
3	Differentiation Rules	3.1-3.11	13
4	Applications of Differentiation	4.1-4.9	11
5	Integrals	5.1-5.5	7
6	Applications of Integration	6.1-6.5	8
			49
Tests	Five One Period Tests		5
	Totals (54 class meetings and 39 sections)		54