SYRACUSE UNIVERSITY

MAT 296
Calculus II
2019-2020
(4 credits)

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MAT 296 comprises the second four credits of the first-year calculus sequence required of all science and engineering students at Syracuse University. The exponential logarithm and inverse trigonometric functions are defined and their calculus developed. Topics covered in the course include: separable and linear differential equations, especially as they relate to exponential growth.; L'Hopital's rule and limits of indeterminate forms, with applications to improper integrals; techniques of integration including: by parts, by partial fractions, and by trigonometric substitution; a brief introduction to calculus in polar coordinates and calculus of parametric curves; infinite sequences, convergence and divergence; infinite series, ratio test, root test, comparison test, integral test and alternating series test; power series and computations with power series, radius of convergence; and Taylor and Maclaurin series.

Course Outline

1. Definition and properties of the natural logarithm. Definition and properties of the exponential function. The calculus of logs and exponentials.
2. L'Hopital's rule and indeterminate forms.
3. Separable and linear differential equations with applications, especially growth and decay models.
4. Definition and properties of inverse trigonometric functions, and the calculus of these functions.
5. Techniques of integration: review of substitution, completing the square, long division, etc. Integration by parts. Integration of powers of trigonometric functions. Integration by partial fractions. Integration by trigonometric substitutions.
6. Improper integrals.
7. Polar coordinates, areas in polar coordinates.
8. Infinite sequences, convergence and divergence, the bounded monotonic sequence property.
9. Infinite series, the geometric series, properties of series, the nth term test, the harmonic series.
10. Taylor series and polynomials, Taylor's formula with remainder, approximation, Maclaurin series.
11. The integral test, comparison test, alternating series test, absolute convergence, the root test, the ratio test.
12. Power series, radius of convergence, interval of convergence. Differentiation and integration of power series.
13. Approximations and computation using power series.
14. Calculus of parametric curves.

Title/Author (Publisher)	Price Per Copy	Ordering Source

Single Variable Calculus: Early Transcendentals, 8th Edition; Stewart, J.
 	
    Hard Text - ISBN: 9781305270336
    eText – ISBN: 9781305548732
 	
Or
 	
Calculus: Early Transcendentals, 8th Edition, Stewart
 	
ISBN: 9781285741550
	$299.95
	$47.49
	
	$299.95
		Cengage Learning
		Phone: 800-354-9706
		https://www.vitalsource.com
		
		Cengage Learning

Calculator		
Texas Instruments: TI-83 Plus - OR - *TI-84 Plus*	$934.49 (For 10) $1,034.59 (For 10)	D & H Distributing Phone: 800-340-1006 (Educational Sales)

Prices are subject to change.