

SUSSEX COUNTY COMMUNITY COLLEGE

**Master College Syllabus**

MATH114 COURSE #	CALCULUS II COURSE TITLE	CLASSIFICATION
4	4	0
CREDITS	CLASS HOURS	LAB HOURS

**RECOMMENDED TEXT:**

Recommended Text: Calculus of a Single Variable: Early Transcendental Functions, 6<sup>th</sup> ed.  
 Author: Larson/Edwards  
 Publisher: Cengage, 2015  
 ISBN: 9781285774794  
 Graphing Calculator: TI-83, TI-83 Plus, or TI-84

**CATALOG DESCRIPTION:**

This course is the second semester of a three semester sequence of introductory calculus. Topics include integration techniques, applications of integration, infinite series, parametric equations, and polar coordinates.

**PREREQUISITES:** MATH113: Calculus I (Grade of C)

**TOPICS TO BE INCLUDED:**

- A. Differential Equations
  - 1. Growth and Decay
  - 2. Separation of Variables
- B. Applications of Integration
  - 1. Area of a Region Between Two Curves
  - 2. Volume: The Disk Method/The Shell Method
  - 3. Arc length and Surfaces of Revolution
  - 4. Work
- C. Integration Techniques and Improper Integrals
  - 1. Basic Integration Rules
  - 2. Integration by Parts
  - 3. Trigonometric Integrals
  - 4. Trigonometric Substitution
  - 5. Partial Fractions
  - 6. Indeterminate Forms and L'Hopital's Rule
  - 7. Improper Integrals
- D. Infinite Series
  - 1. Sequences
  - 2. Series and Convergence
  - 3. The Integral Test and P-Series
  - 4. Comparisons of Series/Alternating Series
  - 5. The Ratio and Root Tests
  - 6. Taylor Polynomials
  - 7. Power Series
  - 8. Taylor Series
- E. Parametric Equations and Polar Coordinates
  - 1. Plane curves and Parametric Equations
  - 2. Polar Coordinates and Polar Graphs

## 3. Polar Equations of Conics and Kepler's Laws

**COURSE COMPETENCIES/LEARNING OUTCOMES:**

In a manner deemed appropriate by the instructor and approved by the department, students should demonstrate the ability to:

1. Use algebraic techniques such as trigonometric substitutions, partial fractions, and by parts, to evaluate integrals. (GE2)
2. Utilize integration techniques to solve problems involving volumes and surface areas of solids of revolution and arc length. (GE2)
3. Use the concept of limit to evaluate improper integrals. (GE2)
4. Test infinite series for convergence and or divergence. (GE2)
5. Use Taylor polynomials to estimate function values. (GE2)
6. Operate in alternate reference frames including polar and parametric coordinates.