

MIDDLESEX COUNTY COLLEGE
EDISON, NJ
MASTER SYLLABUS

Course ID and Name: MAT 131, Analytic Geometry & Calculus I

Department: Mathematics

Prerequisites: MAT 129A/129B or MAT 129 - Precalculus, or appropriate score on the college placement test.

Co-requisites: None

Course Description: Presents fundamental ideas of calculus including the derivative, integral, and their applications. Topics include fundamentals of analytic geometry and transcendental functions. The first course in a sequence of calculus courses intended for the student interested in mathematics, engineering, and the natural, physical and social sciences. *TI 83 or TI 84 calculator required.*

General Education Status: GE MST

Credits: 4

Lecture Hours: 4

Lab Hours: 0

Textbook(s) and Other Course Materials:

Textbook:

Author: Briggs, Cochran, and Gillett
Title: Calculus, 1st Edition
Publisher: Pearson

Student Learning Outcomes:

Upon successful completion of the course, the student will be able to:

1. Interpret limits by graphical, numerical, and analytical methods.
2. Compute derivatives of functions both by applying the limit definition and by the rules of differentiation.
3. Analyze algebraic and transcendental functions by the application of the first and second derivative tests.
4. Apply the Fundamental Theorem of Calculus.
5. Evaluate integrals using basic formulae and integration by substitution.
6. Interpret and solve related rate, optimization, and additional application problems using the methods of Calculus.

Course Content Areas:

1. Graphs and Models, Linear Models and Rates of Change, Functions and Their Graphs
2. The Derivative and the Tangent Line Problem
3. Basic Differentiation Rules and Rates of Change
4. The Product and Quotient rules and Higher-Order Derivatives
5. The Chain Rule
6. Implicit Differentiation
7. Related Rates
8. Extrema on an Interval

9. Rolle's Theorem and the Mean Value Theorem
10. Increasing and Decreasing functions and the First Derivative Test
11. Concavity and the Second Derivative Test
12. Limits at Infinity
13. A Summary of curve Sketching
14. Optimization Problems
15. Differentials
16. Antiderivatives and Indefinite Integration
17. Area
18. Reimann Sums and Definite Integrals
19. The Fundamental Theorem of Calculus
20. Integration by Substitution
21. The Natural Logarithmic Function: Differentiation
22. The Natural Logarithmic Function: Integration
23. Inverse Functions
24. Exponential Functions: Differentiation and Integration
25. Bases Other Than e and Applications
26. Numerical Integration
27. Area of a Region Between Two Curves

Policies:

Disability Support

Students with disabilities, whether physical, learning or psychological, who believe that they may need accommodations in this class, are encouraged to contact Disability Services as soon as possible to ensure that the accommodations are implemented. Please meet with the Disability Services staff in Edison Hall, Room 100, (732) 906-2546.

Code of Student Conduct

To foster a productive learning environment, the College requires that all students adhere to the Code of Student Conduct which is published in the college catalog and website.