MIDDLESEX COUNTY COLLEGE
EDISON, NJ
MASTER SYLLABUS

Course ID and Name: MAT 132, Analytic Geometry & Calculus II

Department: Mathematics

Prerequisites: MAT 131 – Analytic Geometry & Calculus I (or approval of Department Chairperson)

Co-requisites: None

Course Description: Topics include trigonometric and hyperbolic functions, areas, centroids, techniques of integration, parametric curves and vectors, indeterminant forms, Taylor's formula and infinite series, and topics in analytic geometry.

Recommended for students majoring in engineering, mathematics, computer science, social science and the science related areas of chemistry and physics. *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. Compute derivatives and take integrals of the trig functions and hyperbolic functions and their inverse functions.
2. Use the definite integral to determine: area between curves, volumes of solids of revolution, arc lengths of rectifiable curves, and area of surfaces of revolution.
3. Evaluate integrals using: integration by parts, trigonometric substitutions, partial fractions, and integration tables.
4. Evaluate indeterminate forms and evaluate improper integrals.
5. Interpret and solve limits of sequences and infinite series. Be able to use the various tests for infinite series convergence in order to determine convergence and prove it.
6. Be able to determine intervals of convergence for power series and be able to form Taylor series for various special functions. Be able to use the power series in problems involving limits, derivatives, and integrals.

Course Content Areas:

1. Inverse Trig Functions: Differentiation
2. Inverse Trig Functions: Integration
3. Hyperbolic Functions
4. Area of a Region Between Two Curves (review)

5. Volume: The Disk Method
6. Volume: The Shell Method
7. Arc Length and Surfaces of Revolution
8. Work
9. Moments, Center of Mass, Centroids
10. Fluid Pressure and Fluid Force
11. Integration by Parts
12. Trigonometric Integrals
13. Trigonometric Substitution
14. Partial Fractions
15. Integration by Tables and Other Integration Techniques
16. Indeterminate Forms and L'Hopital's Rule
17. Improper Integrals
18. Sequences
19. Series and Convergence
20. The Integral Test and p-Series
21. Comparisons of Series
22. Alternating Series
23. The Ratio and Root Tests
24. Taylor Polynomials and Approximations
25. Power Series
26. Representation of Functions by Power Series
27. Taylor and Maclaurin Series
28. Plane Curves and Parametric Equations
29. Parametric Equations and Calculus
30. Conics and Calculus

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.