SYLLABUS
PART I
EDISON COMMUNITY COLLEGE
MTH 222S CALCULUS AND ANALYTICAL GEOMETRY II
5 CREDIT HOURS

COURSE DESCRIPTION
A standard second-semester calculus course. Topics include techniques and applications of integration, separable differential equations, sequence and series, Taylor's Theorem, vectors and the geometry of space, vector functions and motion in space. Prerequisite: Grade of "C" or better in MTH 221S.

COURSE GOALS

The students will:

Bloom's Level		Gen Ed Outcomes
3	1. Use anti-derivatives to evaluate definite integrals in applications, including areas of planar regions, volume of solids of revolution, arc length, work, centroids, and probability.	1, 3
3	2. Employ a variety of integration techniques to evaluate special types of integrals, including substitution, integration by parts, trigonometric substitution, and partial fraction decomposition.	1, 3
2	3. Understand the relationship between slope fields and solution curves for differential equations.	1, 3
3	4. Solve separable differential equations.	1, 3
3	5. Use Euler's method to find numerical solutions to differential equations.	1, 3
5	6. Evaluate limits that result in indeterminate forms, including the application of L'Hôpital's Rule.	1, 3
5	7. Evaluate improper integrals, including integrals over infinite intervals, as well as integrals in which the integrand becomes infinite on the interval of integration.	1, 3
3	8. Determine the existence of, estimate numerically and graphically, and find algebraically the limits of sequences.	1, 3
3	9. Determine whether a series converges by using appropriate tests, including the comparison, ratio, root, integral and alternating series tests.	1, 3
3	10. Find the nth Taylor polynomial at a specified center for a function and estimate the error term.	1, 3
3	11. Use appropriate techniques to differentiate, integrate and find the radius of convergence for the power series of various functions.	1, 3
4	12. Analyze curves given parametrically and in polar form and find the areas of regions defined by such curves.	1, 3
3	13. Perform and apply vector operations, including the dot and cross product of vectors, in the plane and space.	1, 3
3	14. Determine vector equations of lines and planes in space.	1, 3
3	15. Use curvature, velocity and acceleration using vector ideas and use these ideas to describe the motion of objects traveling in space.	1, 3

CORE VALUES
The Core Values are a set of principles that guide in creating educational programs and environments at Edison. They are communication, ethics, critical thinking, human diversity, inquiry and respect for

learning, and interpersonal skills and teamwork. The goals, objectives, and activities in this course will introduce or reinforce those Core Values whenever possible.

TOPIC OUTLINE

1. Techniques of Integration
2. Improper Integrals
3. Volumes of Rotation
4. Arc Length
5. Applications to Physics and Engineering
6. Modeling with Differential Equations
7. Direction Fields and Euler's Method
8. Separable Equations
9. Exponential Growth and Decay
10. Logistic Equation
11. Predator-Prey Systems
12. Sequences
13. Series
14. Integral and Comparison Tests; Estimating Sums
15. Other Convergent Tests
16. Power Series
17. Representations of Functions as Power Series
18. Taylor and Maclaurin Series
19. Applications of Taylor Polynomials
20. The Three-Dimensional Coordinate System
21. Vectors
22. The Dot Product
23. The Cross Product
24. Equations of Lines and Planes
25. Functions and Surfaces
26. Cylindrical and Spherical Coordinates
27. Polar Coordinates
28. Areas and Lengths in Polar Coordinates
29. Vector Functions and Space Curves
30. Derivatives and Integrals of Vector Functions
31. Arc Length and Curvature
32. Derivatives and Integrals of Vector Functions
33. Parametric Surfaces