SYLLABUS
PART I
EDISON COMMUNITY COLLEGE
MTH 128S PRECALCULUS
5 CREDIT HOURS

COURSE DESCRIPTION
Survey of polynomial, rational, radical, exponential, logarithmic, trigonometric, and inverse trigonometric functions and their graphs, with associated algebraic techniques. Topics also include systems of equations, inequalities, elementary matrices, basic trigonometric ratios, trigonometric identities and equations, vectors, polar coordinates, complex numbers, conics, sequences and series. Prerequisite: satisfactory math assessment score and high school Algebra I, Geometry and Algebra II or a grade of "C" or better in MTH 099D.

COURSE GOALS

The student will:

Bloom's Level		Gen Ed Outcomes
4	1. Model real world situations through mathematical relations and functions.	1, 2, 3
3	2. Represent functions verbally, numerically, graphically, and algebraically.	1, 2, 3
2	3. Describe the domain and range of standard mathematical relations and functions.	1, 3
2	4. Describe the concept of a function as a set of ordered pairs or a correspondence between two sets.	1, 2, 3
4	5. Explain graphical differences between relations and relations that are functions.	1, 2, 3
4	6. Analyze points and slope to find the equation of a line.	1, 3
4	7. Model linear equations with slope as the average rate of change.	1, 3
4	8. Analyze the algebraic structure and characteristics of a graph of a function including intercepts, domain, range, and intervals of increase or decrease.	1, 3
5	9. Express transformations and translations of functions both algebraically and graphically.	1, 3
3	10. Apply the basic function operations of addition, subtraction, multiplication, division and composition to real and complex numbers.	1, 3
4	11. Analyze and explain through algebraic and graphical techniques the zeros of polynomial and rational functions.	1, 3
4	12. Analyze and determine symmetry of an equation algebraically and graphically.	1, 3
5	13. Express the meaning of an inverse through ideas connected to algebra and geometry.	1, 2, 3
3	14. Solve linear and quadratic equations algebraically including applications such as interest, geometry, mixtures and distance/time.	1, 2, 3
3	15. Solve quadratic equations by factoring, completing the square and the quadratic formula including those with complex roots.	1, 3
3	16. Solve polynomial equations, radical equations and absolute value equations and inequalities.	1, 3
3	17. Solve linear inequalities algebraically and graphically including applications.	1, 3
3	18. Solve systems of linear equations algebraically and graphically including applications.	1, 3
4	19. Compare and contrast the properties of general functions with those of exponential functions.	1, 2, 3
5	20. Integrate the concept of an inverse relationship in developing the characteristics of a logarithmic function.	1, 3

3	21. Calculate and simplify exponential and logarithmic expressions.	1, 3
3	22. Solve exponential and logarithmic equations including models of growth and decay.	1, 3
3	23. Solve triangles by using trigonometric ratios.	1, 3
3	24. Solve application problems with right and oblique triangles using both degree and radian measures.	1, 3
2	25. Explain the nature of trigonometric functions and their identities.	1, 2, 3
	26. Define Trigonometric functions in terms of the Unit Circle.	1, 3
3	27. Construct the graphs of trigonometric and inverse trigonometric functions.	1, 3
1	28. Analyze and represent transformations of graphs of trigonometric and inverse trigonometric functions.	1, 3
2	29. Describe the inverse trigonometric functions and use this description to solve problems.	1, 2, 3
4	30. Derive the Laws of Sines and Cosines and apply to applications.	1, 3
4	31. Interpret physical situations using vectors and their operations.	1, 2, 3
2	32. Represent vectors graphically in both rectangular and polar coordinates.	1, 3
2	33. Contrast the properties of the point (x, y) and the vector $x\hat{\imath} + y\hat{\jmath}$.	1, 2, 3
2	34. Describe the location of points in the plane by polar coordinates.	1, 3
2	35. Describe the relationship between polar coordinates and rectangular coordinates and translate between coordinate systems.	1, 3
3	36. Express complex numbers in polar form.	1, 3
3	37. Perform operations on complex numbers.	1, 3
3	38. Find ratios and powers of complex numbers.	1, 3
3	39. Solve trigonometric and inverse trigonometric equations including those requiring trigonometric identities.	1, 3
4	40. Prove trigonometric identities using the properties of the functions.	1, 2, 3
1	41. Define sequences both explicitly and recursively.	1, 3
5	42. Express series with summation notation.	1, 3
5	43. Express the general term of arithmetic and geometric sequences.	1, 3
3	44. Compute the sum of arithmetic and geometric series.	1, 3
3	45. Perform matrix arithmetic.	1, 3
5	46. Rewrite linear systems as augmented matrices.	1, 3
3	47. Solve linear systems by performing Gauss-Jordan elimination on an augmented matrix.	1, 3
5	48. Rewrite linear systems as matrix equations.	1, 3
3	49. Solve matrix equations with matrix inverses.	1, 3
5	50. Support problem solving and solution methods by using effective group interactions.	5
3	51. Demonstrate understanding through written laboratory activity reports.	2

CORE VALUES

The Core Values are a set of principles that guide in creating educational programs and environments at Edison. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will introduce/reinforce these Core Values whenever appropriate.

TOPIC OUTLINE
1. Algebraic and graphical problem solving techniques
2. Translations of basic function graphs
3. Basic operations on functional expressions
4. Analysis of polynomial functions
5. Analysis of rational functions
6. Exponential and logarithmic functions
7. Radian measure
8. Trigonometric ratios

9. Trigonometric functions and their graphs
10. Polar coordinates
11. Linear systems, vectors, and matrices
12. Sequences and series