Sinclair Community College
444 E. Third St.
Dayton, OH 45402

Master Syllabus

MAT 2280 - Calculus & Analytic Geometry II

Division: Science, Mathematics and Engineering

Department: Mathematics

Credit Hour Total: 5.0 **Lecture Hrs:** 5.0

Prerequisite(s): MAT 2270

Other Prerequisite(s): AND Other with a grade of C or better or satisfactory score on math placement test

Date Revised: March 2015

Course Description:

Applications of the definite integral, techniques of integration, indeterminate form, L'Hopital's Rule, improper integrals, conic sections, infinite sequences and series, Taylor series, parametric equations, polar coordinates, solid analytic geometry, vectors in the plane and space, dot and cross product of two vectors.

General Education Outcomes:

- Critical Thinking/Problem Solving Competency

Course Outcomes:

Vector Operations
Demonstrate the ability to perform operations involving vectors in the plane and in space.

Assessment Method: Locally developed exams
Performance Criteria: Score of 70% or better on exams

Sequences and Series
Demonstrate the ability to determine whether a sequence or series converges or diverges.

Assessment Method: Locally developed exams
Performance Criteria: Score of 70% or better on exams

Graphs of Conic Sections
Demonstrate the ability to graph conic sections in translated and rotated coordinate systems.

Assessment Method: Locally developed exams
Performance Criteria: Score of 70% or better on exams

Techniques of Integration
Demonstrate the ability to evaluate definite integrals.

Assessment Method: Locally developed exams
Performance Criteria: Score of 70% or better on exams

Applications of Calculus
Demonstrate the ability to solve applications problems involving area and volumes of solids of revolution.

Assessment Method: Locally developed exams
Performance Criteria: Score of 70% or better on exams

Outline:

Use antiderivatives to evaluate definite integrals and apply definite integrals in a variety of applications to model physical, biological or economic situations.Employ a variety of integration techniques to evaluate special types of integrals, including substitution, integration by parts, trigonometric substitution, and partial fraction decomposition.Evaluate limits that result in indeterminate forms, including the application of L’Hôpital’s Rule.Evaluate improper integrals, including integrals over infinite intervals, as well as integrals in which the integrand becomes infinite on the interval of integration.Find, graph, and apply the equations of conicsaxes.Determine the existence of, estimate numerically and graphically, and find algebraically the limits of sequences. Determine whether a series converges by using appropriate tests, including the comparison, ratio, root, integral and alternating series tests.Find the nth Taylor polynomial at a specified center for a function and estimate the error term. Use appropriate techniques to differentiate, integrate and find the radius of convergence for the power series of various functions.Analyze curves given parametrically and in polar form and find the areas of regions defined by such curves.Perform and apply vector operations, including the dot and cross product of vectors, in the plane and space.