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

Master Syllabus

MAT 2270 - Calculus & Analytic Geometry I

Division: Science, Mathematics and Engineering

Department: Mathematics

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

Prerequisite(s): MAT 1570OR MAT 1580

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

Date Revised: August 2017

Course Description:

Cartesian coordinate system, functions, limits and continuity of functions, the derivative and its applications, the integral and the Fundamental Theorem of Calculus. Derivatives and integrals involving piecewise, polynomial, rational, algebraic, exponential, logarithmic, trigonometric, inverse trigonometric and hyperbolic functions and their inverses.

General Education Outcomes:

- Critical Thinking/Problem Solving Competency

Course Outcomes:

Applications of Derivatives and Integrals
Solve area, related rates, motion and optimization problems using derivatives and integrals.

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

Derivatives and Integrals
Demonstrate the ability to determine the derivative of a function and evaluate definite integrals.

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

Limits and Continuity
Demonstrate the ability to apply definitions and theorems to evaluate the limit of a function and to determine the continuity of a function at a point or on an interval.

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

Graphs of Functions
Demonstrate the ability to sketch the graph of algebraic and trigonometric functions using calculus.

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

Outline:

Determine limits of functions.Analyze the continuity of a function.Find derivatives of functions, interpret derivatives as slope and rate of change.Determine the derivative and higher order derivatives of a function explicitly and implicitly and solve related rate problems.Determine extrema for continuous functions, use derivatives to analyze and sketch the graph of a function, solve optimization problems.Determine when the Mean Value Theorem can be applied and use it in proofs of other theorems.Use differentials and linear approximations to analyze applied problems.Approximate a definite integral by the Trapezoidal Rule and Simpson's Rule.Determine antiderivatives, indefinite and definite integrals, use definite integrals to find areas of planar regions, use the Fundamental Theorems of Calculus.