

## 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

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#### 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 conics. 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  $n$ th 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.