MATH 155 - CALCULUS AND ANALYTIC GEOMETRY II

1. <u>Course Description</u>

- o This second course in a three-semester calculus sequence covers advanced integration techniques, improper integrals, infinite series, conic sections, parametric equations, and polar coordinates. The course is designed for mathematics, science, and engineering majors.

2. <u>Topics Covered</u>

- o Applications of integration
  Area between curves
  Volume of a solid of revolution
  Arc length.
- o Techniques of integration
  Substitution, integration by parts
  Trigonometric integrals
  Integration by trigonometric substitution
  Integration by partial fractions
  Numerical integration; trapezoidal and Simpson's Rule
  Improper integrals.
- o Sequences and series
  Polynomial approximation and Taylor's theorem
  Convergence of sequences
  Properties of infinite series
  Integral test, nth term test
  P-series test, comparison tests
  Ratio and root tests
  Alternating series test
  Absolute convergence
  Interval of convergence of power series
  Differentiation and integration of power series
  Power series representations of functions
  Taylor series.
- o Conic sections
  Parabolas, ellipses

  Graphs of plane curves
  Parametric form of the derivative
  Arc length in parametric form
  Graphs of polar equations
  Area and arc length in polar coordinates.
- o Differential equations
  Separation of variables
  General and particular solutions
  Initial-value problems.
- o Using graphing technology to analyze topics
  Graphical manner

Numerical manner
Tabular manner

3. **What to expect?**
   o **Time: The most common term lengths are listed below; others would be**