**Mathematics 3333 - Calculus III**

**Student Learning Outcomes**

**1. Students will demonstrate factual knowledge of the mathematical notation and terminology used in this course.** Students will demonstrate the ability to read, interpret, and use the vocabulary and symbolism of vectors, infinite series, and, multivariate calculus.

**2. Students will be able to describe the fundamental principles arising from the concepts in this course.** Students will demonstrate familiarity with the concepts that follow from the definitions; for example, convergence and divergence of infinite series, tangent planes and normal lines to surfaces, integral representations of areas and volumes.

**3. Students will be able to apply the course material to solve problems.** Students will use the facts, formulas, and techniques of calculus III to solve problems pertaining to the core concepts of the course, as well as to other areas of mathematics and various applied areas such as physics, chemistry and engineering.

**4. Students will develop specific skills, competencies and reasoning abilities to support further study or work in this or related fields.** Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study in academic areas requiring calculus III as a prerequisite or for work in fields such as engineering, physics, chemistry and statistics.

**Course Content**

**Textbook:** *Essential Calculus: Early Transcendentals;* 2nd edition; by James Stewart. The following chapters are covered. (See textbook "Contents")

**Chapter 8 – Infinite Series**: Sequences and series, integral test and p-series, comparison tests, alternating series, ratio and root tests, power series, Taylor and Maclaurin series, approximations using power series.

**Chapter 10 – Vectors and the Geometry of Space**:Space coordinates, vectors in the plane and space, dot product, cross product, equations of lines and planes, quadric surfaces.

**Chapter 11** – **Partial Derivatives**: Properties of functions of several variables, limits and continuity, partial derivatives, tangent planes, chain rule, directional derivatives, gradients, extrema.

**Chapter 12 – Multiple Integrals**:Double integrals over rectangular and nonrectangular regions, double integrals using polar coordinates, triple integrals, change of variables.