

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 principals 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: *Calculus: Early Transcendentals*, Sixth Edition, by James Stewart. The following chapters are covered. (See textbook “Contents”)

- 11. Infinite Sequences and Series:** definition of sequences and series, integral test and p-series, comparisons of series, alternating series, ratio and root tests, power series, representation of functions by power series, Taylor and Maclaurin series, Taylor polynomials and approximations.
- 12. Vectors and the Geometry of Space:** vectors in the plane, space coordinates and vectors in space, dot product, cross product, lines and planes in space, surfaces in space.
- 14. Partial Derivatives:** Functions of several variables, limits and continuity, partial derivatives, differentials, tangent planes, chain rule, normal lines, extrema and applications.
- 15. Multiple Integrals:** iterated integrals, double integrals, polar coordinates, changes of variables.