Standards for Calculus III
Math 272

This course introduces students to the theory, techniques, and applications of three related topics: Sequences and series, vector calculus, differential and integral calculus of multivariable functions.

Pre-Requisite Skills
Students will be able to
- Demonstrate familiarity with graphical and algebraic representations of the elementary functions (lines, quadratics, exponentials, logarithms, trigonometric, etc.);
- Compute limits (especially of indeterminate forms);
- Compute derivatives and antiderivatives of single-variable functions.

Performance Skills
Students will be able to
- Compute partial sums;
- Identify a geometric series and, if it converges, compute its sum;
- Apply various tests for convergence (integral, comparison, ratio);
- Determine the interval of convergence for a power series;
- Find the Taylor Polynomial of degree n and the Taylor Series representation for a function;
- Differentiate and integrate Taylor Series;
- Perform algebraic computations involving vectors
  - Magnitude;
  - Unit vector;
  - Dot Product;
  - Cross Product;
  - Vector projections;
- Utilize the Dot/Cross Product to
  - Answer question involving orthogonality;
  - Compute work;
  - Find equations of plane;
  - Compute areas and volumes;
- Describe and recognize graphs of functions of two variables;
- Determine limiting and continuity properties of functions;
- Compute partial derivatives, differentials, gradients, and directional derivatives;
- Find equations of tangent planes;
- Find extrema.

Pedagogical Standards
Instructors should attempt to instill certain vital problem-solving and communication skills in their students. The Mathematics Department wishes all students who successfully complete this course to possess the following skills.
Students will be able to
- Apply appropriate technology to solve problems;
  - Model phenomena mathematically;
• Work cooperatively with others;
• Read and understand complex mathematical problems;
• Describe the methods used to approach a problem;
• Express solutions in written and oral form.