

## MATH 244 – CALCULUS IV SYLLABUS

**Course Description:** Multiple integrals; line integrals and Green's Theorem; surface integrals, Stoke's and Gauss's Theorem. 3 credits.

**Prerequisite:** 243 or consent.

**Text.** *Calculus* by James Stewart, 4th edition.

**Polar, cylindrical and spherical coordinates.** (3 weeks)

Cover sections 11.4–11.5 (11.6–11.7 are optional), section 13.7, and Kepler's laws from section 14.4. The program Derive is useful for illustrating these concepts.

**Chapter 16: Multiple integrals.** (5 weeks)

Double integrals and iterated integrals in rectangular and polar coordinates. Applications, including surface area. Triple integrals in rectangular, cylindrical and spherical coordinates. Change of variables in multiple integration.

**Chapter 17: Vector calculus.** (7 weeks)

The calculus of vector fields, including line integrals, the fundamental theorem of line integrals, and Green's Theorem. Curl and divergence. Parametric surfaces. Surface integrals, Stoke's Theorem and Gauss's divergence theorem.