

APPLIED CALCULUS II
MATH 114 : 4 Credit hours (3 lectures, 0 lab, 2 exercises)

Prerequisites:
MATH 113

Objectives:

- To study infinite series and applications.
- To introduce students to calculus of functions of two and three variables.
- To study parametric equations and polar coordinates.
- To study techniques of double and triple integration.
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Course Description:

This Course Teaches Applied Calculus Part Two.

Contents:

- Sequences and limit of a sequence;
- Infinite series of constant terms, convergence tests, alternating series and absolute convergence. Power series, the ratio test, and radius of convergence; differentiation and integration of power series. Taylor and Maclaurin series; Taylor expansion of differentiable functions.
- Functions of several variables: limits and continuity, partial derivatives, directional derivatives, the total derivative. The gradient of a scalar function; chain rule. Maxima and minima and their tests.
- Polar coordinates and polar graphs; conic sections, parametric equations; curves in the plane and in space; and lines and planes in space.
- Double and triple integration; areas and volumes; Change of variables in multiple integrals. Improper integrals.

The instructor should stress on using mathematical software through out the course.

References:

- *CALCULUS*, 6th edition , Swokowski, Olinick , Pence PWS Publishing Company.
- *CALCULUS*, By Larson , Hostetler & Edwards Publisher: Houghton Mifflin.
- *SCHAUM'S OUTLINE OF CALCULUS*, Frank Ayres, Elliott Mendelson Graw Hill Mc.