Multivariable Calculus Syllabus

Course Description/Goals:

This course is designed as an additional math course for those students who have successfully completed AP Calculus BC and have an interest in continuing their mathematical studies while in high school. Multivariable Calculus takes the concepts learned in the single variable calculus course and extends them to multiple dimensions. There is no Advanced Placement test or other college credit associated with this course.

Course TEKS/Objectives:

Topics discussed include: vector algebra; applications of the dot and cross product; equations of lines, planes, and surfaces in space; converting between rectangular, cylindrical, and spherical coordinates; continuity, differentiation, and integration of vector-valued functions; application of vector-valued functions such as curvature, arc length, speed, velocity, and acceleration; continuity, limits, and derivatives of multivariable functions, tangent planes and normal lines of surfaces; applying double and triple integrals to multivariable functions to find area, volume, surface area, mass, center of mass, and moments of inertia; vector fields; finding curl and divergence of vector fields; line integrals; conservative vector fields, conservation of energy; Green's Theorem; parametric surfaces, including normal vectors, tangent planes, and areas; orientation of a surface; Divergence Theorem; and Stokes's Theorem.
https://tea.texas.gov/academics/learning-support-and-programs/innovative-courses/innovative-courses-foundation

Course Outline:

Semester 1	Semester 2
-Applications of Integration -Conics, Parametrics, Polar -Vectors and the Geometry of Space -Vector-Valued Functions -Functions of Several Variables	-Functions of Several Variables -Multiple Integration -Integration -Topics in Differential Equations