Math 263 Course Content and Objectives

COURSE CONTENT AND SCOPE - **Lecture:** Outline the topics included in the lecture portion of the course *(Outline reflects course description, all topics covered in class).*	Hours Per Topic	COURSE OBJECTIVES - **Lecture:** Upon successful completion of this course, the student will be able to...*(Use action verbs - see Bloom's Taxonomy for 'action verbs requiring cognitive outcomes.')*
Three-dimensional coordinate systems, vectors and vector operations in two dimensions, the dot product, the cross product, triple products and projections, vector and parametric equations of lines and planes, rectangular equation of a plane, and equations of cylinders and quadric surfaces.	20	Work with vectors within the context of a three-dimensional coordinate system, compute the dot product and cross product of two vectors, find the equation of a line or plane, graph cylinders and quadric surfaces.
Vector functions, properties of limits and continuity, space curves, derivatives and integrals of vector functions, arc length, curvature, motion in space, velocity, acceleration.	15	Compute derivatives and integrals of vector functions, find the tangent, normal, binormal, arc length, curvature, velocity, and acceleration of a space curve.
Functions of several variables, level curves and surfaces, limits and continuity, partial derivatives, tangent planes and linear approximations, differentiability, the chain rule, directional derivatives and the gradient vector, maximum and minimum values, saddle points, and Lagrange multipliers.	20	For functions of several variables, compute partial derivatives, find limits and determine continuity, find tangent planes and linear approximations, determine differentiability, apply the chain rule, compute directional derivatives and gradients, find local and global extrema on various domains, test for saddle points, use Lagrange multipliers to find extrema of functions under various constraints.
Double integrals over rectangles, iterated integrals, double integrals over general regions, double integrals in polar coordinates, applications of double integrals, surface area, triple integrals, triple integrals in cylindrical coordinates, triple integrals in spherical coordinates, change of variables in multiple integrals.	15	Calculate double integrals over rectangles, calculate iterated integrals, calculate double integrals over general regions, calculate double integrals in polar coordinates, apply double integration to the solution of various problems in the natural and social sciences, find surface area, calculate triple integrals in rectangular, cylindrical, and spherical coordinates, use change of variables to simplify multiple integration.
Vector field, gradient vector field, conservative vector field, line integrals, the fundamental theorem for line integrals, Green's theorem, curl and divergence, parametric surfaces and their areas, surface integrals, Stokes' theorem, and the divergence theorem.	18	Calculate vector fields and line integrals, use the fundamental theorem for line integrals, use Green's theorem, calculate the curl and divergence, work with parametric surfaces and find their areas, compute surface integrals and apply Stokes's theorem, and apply the divergence theorem.
Final examination.	2	Final examination.
Total: Total Lecture Hours In Section I Class Hours:	90 90	