MATH 222 Analytic Geometry and Calculus III

Required of ARE, BAE, CE, CHE, CMPEN, EE, IE, ME

Catalog Description: (4) I, II, S. Continuation of MATH 221 to include functions of more than one variable.

Prerequisites: C or better in MATH 221

Textbook: *Calculus*, Larson, Hostetler, Edwards, Houghton-Mifflin, Seventh Edition.

Course Objectives: Develop calculus for functions of many variables together with vector analysis in two and three dimensional space.

Sessions: Two 50 minute lectures and two 50 minute recitations per week.

Chapter	Topics	Sessions
12	Vectors in the Plane, Rectangular Coordinates, and Vectors in Space	2
	The Cross Product of Two Vectors	2
	Lines and Planes in Space	2
	Curves, Motion in Space, Curvature, and Acceleration	2
	Cylinders and Quadric Surfaces	2
	Cylindrical and Spherical Coordinates	2
13	Functions of Several Variables	2
	Limits, Continuity, and Partial Derivatives	2
	Maxima and Minima of Functions of Several Variables	2
	Increments and Differentials	2
	The Chain Rule	2
	Directional Derivatives and the Gradient Vector	2
	Lagrange Multipliers and Constrained Maximum-Minimum Problems	2
	The Second Derivitave Test for Functions of Two Variables	2
14	Double Integrals and Double Integrals over More General Regions	4
	Area and Vloume by Double Integration	2
	Double Integrals in Polar Coordinates	2
	Applications of Double Integrals	2
	Triple Integrals	2
	Integration in Cylindrical and Spherical Coordinates	2
	Surface Area	2
	Change of Variables in Multiple Integrals	2
15	Line Integrals and Vector Fields	2
	The Fundamental Theorem and Independence of Path	2
	Green's Theorem, Surface Integrals and the Divergence Theorem	4
	Stoke's Theorem	2
Reviews		5
Total		61