MATH 220 Analytic Geometry and Calculus I

Required of ARE, BAE, CE, CHE, CS, CMPEN, CNSM, DEN, EE, IE, ME

Catalog Description: (4) I, II, S. Analytic geometry, differential and integral calculus of algebraic and trigonometric functions.

Prerequisites: B or better in MATH 100 and C or better in MATH 150; or three years of college preparatory mathematics including trigonometry and a Calculus I PROB > or = C of 55 or more on the ACT assessment [1] by K-State; or a score of at least 26 on the mathematics placement test [1] .

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

Course Objectives: Cover the basic concepts and theorems of differential and integral calculus. Present some applications to the sciences.

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

Chapter	Topics	Sessions
1	Functions and Mathematical Modeling	2
	Graphs of Equations and Functions and A Brief Catalog of Functions	4
	What is Calculus ?	2
2	Tangent Lines and Slope Predictors	2
	The Limit Concept	4
	More about Limits and the Concept of Continuity	2
3	The Derivative and Rates of Change	2
	Basic Differentiation Rules	2
	The Chain Rule and Derivatives of Algebraic Functions	2
	Maxima and Minima of Functions on Closed Intervals	2
	Applied Maximum - Minimum Problems	2
	Derivatives of Trigonometric Functions	2
	Implicit Differentiation and Related Rates	2
	Successive Approximations and Newton's Method	2
4	Increments, Differentials, and Linear Approximation	2
	Increasing and Decreasing Functions and the Mean Value Theorem	2
	The First Derivative Test, Applications, and Simple Curve Sketching	2
	Higher Derivatives, Concavity, Curve Sketching, and Asymptotes	2
5	Antiderivatives and Initial Value Problems	2
	Elementary Area Computations, Riemann Sums, and the Integral	2
	Evaluation of Integrals	2
	Average Values and the Fundamental Theorem of Calculus	2
	Integration by Substitution and Areas of Plane Regions	4
6	Setting up Integral Formulas	3
	Volumes by the Methods of Cross Sections and Cylindrical Shells	4
Reviews		2
Total		61

[1] The ACT assessment done by K-State is based on prior student's ACT scores and their performance in K-State courses. The assessment profile is available when the student comes to enroll at K-State for the first time and is included in their enrollment packet. The mathematics placement test and the arithmetic placement test are administered on a walk-in-basis in the Academic Assistance Center, 101 Holton Hall, on the K-State campus. For more information, call the Academic Assistance Center, 785-532-6492.