SYLLABUS

MATH 22005 – Analytic Geometry & Calculus III

(4 Credit Hours)

Catalog Information:

Study of functions of several variables, including partial derivatives and multiple integrals.

Prerequisite: MATH 12003.

Text: *Essential Calculus*, 2nd edition, by James Stewart (KSU custom edition)

Text Web Site: http://www.stewartcalculus.com/

Chapter 10: Vectors and the Geometry of Space (9 days)

§10.7 Vector functions and space curves

- derivatives and integrals of vector functions

§10.8 Arc length and curvature

§10.9 Motion in space

Note: Previous sections of Chapter 10 are covered in MATH 12003.

Chapter 11: Partial Derivatives (15 days)

§11.1 Functions of several variables

§11.2 Limits and continuity

§11.3 Partial derivatives

§11.4 Tangent planes and linear approximations

§11.5 Chain rule

§11.6 Directional derivatives and the gradient vector

§11.7 Maximum and minimum values

§11.8 Lagrange multipliers

(MATH 22005 Syllabus, continued)

Chapter 12: Multiple Integrals (11 days)

§12.1 Double integrals over rectangles

§12.2 Double integrals over general regions

§12.3 Double integrals in polar coordinates

§12.4 Applications of double integrals

§12.5 Triple integrals

§12.6 Triple integrals in cylindrical coordinates

- introduction to cylindrical coordinates
- triple integrals

§12.7 Triple integrals in spherical coordinates

- introduction to spherical coordinates
- triple integrals

§12.8 Change of variables in multiple integrals

Chapter 13: Vector Calculus (19 days)

§13.1 Vector fields

§13.2 Line integrals

§13.3 Fundamental theorem for line integrals

§13.4 Green's theorem

§13.5 Curl and divergence

§13.6 Parametric surfaces and their areas

§13.7 Surface integrals

§13.8 Stokes' theorem

§13.9 Divergence theorem

Reviews and Exams (5 - 6 days)