SYLLABUS

MATH 12003 – Analytic Geometry and Calculus II

(5 Credit Hours)

Catalog Information: Continued study of techniques and applications of integration; trigonometric, logarithmic and exponential functions; polar coordinates; vectors; parametric equations; sequences and series. Prerequisite: MATH 12002 or MATH 12012 with a minimum grade of C (2.0).

Text: Essential Calculus, 2nd edition (KSU Flashbooks), Stewart, Cengage.

Text website: http://www.stewartcalculus.com/

Chapter 6: Techniques of Integration (15 – 16 days)

§6.1 Integration by parts

§6.2 Trigonometric integrals and trigonometric substitutions

§6.3 Partial fractions

§6.4 Integration using tables

§6.5 Approximate integration

- midpoint rule
- trapezoidal rule
- Simpson's rule

§6.6 Improper integrals

Note: Section on "Strategy for Integration" is available on the text web site under Additional Topics.

Chapter 7: Applications of Integration (12 days)

§7.2 Volumes

§7.3 Volumes by cylindrical shells

§7.4 Arc length

§7.6 Applications to physics and engineering

- work
- hydrostatic pressure and force

- moments and center of mass

Notes:
- §7.5 "Area of a Surface of Revolution" is optional.
- §7.7 "Differential Equations" is optional.

Chapter 8: Series (20 days)

§8.1 Sequences

§8.2 Series

§8.3 Integral and comparison tests

§8.4 Other convergence tests

- alternating series
- absolute convergence
- ratio test
- root test

§8.5 Power series

§8.6 Representing functions as power series

- differentiating and integrating power series

§8.7 Taylor and Maclaurin series

- remainder theorem
- ex , sin x , cos x
- binomial series

§8.8 Applications of Taylor polynomials

Note: Section on "Strategy for Testing Series" is available on the text web site under Additional Topics.

Chapter 9: Parametric Equations and Polar Coordinates (89 days)

§9.1 Parametric curves

§9.2 Calculus with parametric curves

- tangents
- areas
- arc length

§9.3 Polar coordinates

§9.4 Areas and lengths in polar coordinates

§9.5 Conic sections in polar coordinates

Note: §9.5 contains a brief review of conic sections in Cartesian coordinates. A more complete treatment is available the text web site under Review Conic Sections.

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

§10.1 Three dimensional coordinate systems

§10.2 Vectors

§10.3 Dot product

§10.4 Cross product

§10.5 Equations of lines and planes

§10.6 Cylinders and quadric surfaces

Note: Remaining sections of Chapter 10 are covered in MATH 22005.

Reviews and Exams (4 – 8 days)