

SYLLABUS

MATH 12013 – Brief Calculus II

(3 Credit Hours)

Catalog Information: This is a condensed version of MATH 12003 to meet the needs of majors that do not require the full force of Math 12003. The course starts with integration by parts, approximating integrals, and applications of integrals. It follows with a brief introduction to series, parametric equations and polar coordinates, and finishes with vectors and geometry of space. . Prerequisite: Minimum C grade in MATH 12002 or MATH 12012 or MATH 12021.

Text: Essential Calculus, 2nd edition, Stewart, Cengage.

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

Chapter 6: Techniques of Integration (5 hours)

§6.1 Integration by parts

§6.5 Approximate integration

- midpoint rule
- trapezoidal rule
- Simpson's rule

Chapter 7: Applications of Integration (6 hours)

§7.2 Volumes

§7.3 Volumes by cylindrical shells

§7.6 Applications to physics and engineering

- moments and center of mass

Chapter 8: Series (6 hours)

§8.1 Sequences

§8.2 Series

§8.5 Power series: only basic concepts, 2-3 examples (like in Table on page 473), theorem 3 without proof.

Chapter 9: Parametric Equations and Polar Coordinates (9 hours)

§9.1 Parametric curves

§9.2 Calculus with parametric curves

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- tangents
- areas
- arc length

§9.3 Polar coordinates

Chapter 12: Multiple Integrals (2 hours)

§12.6 Cylindrical Coordinates: examples 1, 2 only.

§12.7 Spherical Coordinates: examples 1, 2 only.

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

§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

Reviews and Exams (7 hours)