

Course Number: MATH 2564 Calculus II

This course is a continuation of MATH 2554. Topics include applications of integration, techniques of integration, improper integrals, infinite series, conic sections, parametric curves, and polar coordinates.

Prerequisite

MATH 2554 with a grade of C or better, or appropriate placement scores or consent of instructor.

Credit/Contact/Load Hours

4 credit hours, 4 contact hours, 4 load hours

Target Audience and Transfer

This course is designed for transfer students who are interested in technical or science based fields. It is the second in a sequence of three differential and integral calculus courses and transfers as such.

Student Learning Outcomes

Upon successful completion of this course students should exhibit mastery of certain knowledge and basic skills. These skills will include, but not be limited to:

- 1) Applications of integration including area, volume, surface area, work, and fluid pressure and force.
- 2) Use of basic integration techniques including u-substitution, integration by parts, trigonometric integrals, trigonometric substitution, partial fractions and evaluation of improper integrals.
- 3) Determine convergence or divergence of infinite series
- 4) Represent various functions using power series (including Taylor and Maclaurin series)
- 5) Convert among rectangular, polar and parametric forms and apply calculus techniques using polar coordinates and parametric equations.
- 6) Identify basic properties of and graph conic sections

Required Text:

Calculus, Early Transcendentals

Briggs, Cochran. Addison-Wesley 2011

Required Topics:

Section	Topic
*Appendix C	Hyperbolic Functions
6.2	Regions Between Curves
6.3	Volume by Slicing
6.4	Volume by Shells
6.5	Length of Curves
6.6	Physical Applications
7.1	Integration by Parts
7.2	Trigonometric Integrals
7.3	Trigonometric Substitutions
7.4	Partial Fractions
7.7	Improper Integrals
7.8	Introduction to Differential Equations
8.1	An Overview
8.2	Sequences

8.3	Infinite Series
8.4	The Divergence and Integral Tests
8.5	The Ratio, Root, and Comparison Tests
8.6	Alternating Series
9.1	Approximating Functions with Polynomials
9.2	Properties of Power Series
9.3	Taylor Series
9.4	Working with Taylor Series
10.1	Parametric Equations
10.2	Polar Coordinates
10.3	Calculus in Polar Coordinates
10.4	Conic Sections

*Appendix C does not have to be covered thoroughly. Students need to be introduced to the definitions of hyperbolic sine and cosine, and be able to evaluate basic integrals and derivatives with these functions. You may place this section later in Chapter 6 if that would flow better for you but there are some problems in Chapter 6 that refer to hyperbolics.

Optional Sections 6.1, 6.7, 6.8, 7.5, 7.6

Required Instructional Activities

The content of the course should be taught with graphing calculators as an available tool when appropriate.

Please note that the only resource other than a graphing calculator allowed for use by students during the final exam will be a departmental formula sheet. It is also a departmental policy that no TI-89 or TI-92 or comparable calculators be allowed for use during the final exam.