

Tennessee Technological University
Mathematics Department

MATH 1920: Calculus II

I. COURSE DESCRIPTION FROM CATALOG:

Integrals of functions of one variable with applications, sequences and series. Lec. 4. Cr. 4.

II. PREREQUISITE(S):

C or better in MATH 1910; or equivalent AP credit for MATH 1910

III. COURSE OBJECTIVE(S):

To study integrals of functions of one variable and their applications in the physical and life sciences.

IV. STUDENT LEARNING OUTCOMES:

Upon successful completion of the course a student will be able to evaluate integrals using the substitution method, integration by parts, trigonometric substitutions, and partial fraction decomposition, including being able to recognize and evaluate improper integrals; be able to apply techniques of integration to solve problems involving the area between two curves, the surface area and volume of a solid of revolution and the arc length of a curve; be able to apply differentiation and integration techniques to determine certain properties of curves given parametrically, including those given by polar equations; be able to use standard tests to determine the convergence of sequences and series; and be able to create Taylor and Maclaurin series and determine the interval of convergence of such series.

V. TOPICS TO BE COVERED:

Appendix:

G: The Logarithm Defined as an Integral (optional)

Chapter 6:

6.1 Areas between Curves

6.2 Volumes

6.3 Volumes by Cylindrical Shells

6.4 Work (optional)

6.5 Average Value of a Function

Chapter 7:

7.1 Integration by Parts

7.2 Trigonometric Integrals

7.3 Trigonometric Substitution

7.4 Integration of Rational Functions by Partial Fractions

7.5 Strategy for Integration

7.6 Integration Using Tables and Computer Algebra Systems (optional)

7.7 Approximate Integration

7.8 Improper Integrals

Chapter 8:

8.1 Arc Length

8.2 Area of a surface of a Revolution

8.3 Applications to Physics and Engineering

Chapter 10:

10.1 Curves Defined by Parametric Equations

10.2 Calculus with Parametric Curves

10.3 Polar Coordinates

10.4 Areas and Lengths in Polar Coordinates

10.5 Conic Sections (optional)

Chapter 11:

11.1 Sequences

11.2 Series

11.3 The Integral Test and Estimates of Sums

11.4 The Comparison Tests

11.5 Alternating Series

11.6 Absolute Convergence and the Ratio and Root Tests

11.7 Strategy for Testing Series

11.8 Power Series

11.9 Representations of Functions as Power Series

11.10 Taylor and McLaurin Series

VI. POSSIBLE TEXTS AND REFERENCES:

Calculus Early Transcendentals, 8th edition by James Stewart

VII. STUDENT ACADEMIC MISCONDUCT POLICY:

Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the definitions of academic misconduct and policies and procedures for addressing Academic Misconduct at Tennessee Tech. For details, view the Tennessee Tech's Policy 217 – Student Academic Misconduct at [Policy Central](#).

VIII. DISABILITY ACCOMMODATION:

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119. For details, view the Tennessee Tech's Policy 340 – Services for Students with Disabilities at [Policy Central](#).