

# Texas A&M University-San Antonio

## MATH 2314: Calculus II Lab – Spring 2026

### **Instructor Information**

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**Instructor:** Anthony Herrera

**Email:** [aherrera1@tamus.edu](mailto:aherrera1@tamus.edu)

**Class Meeting:** Fridays, 12:00 am – 12:50 am

**Office Hours:** No office hours

### **Course Overview & Requirements**

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**Course Overview:** Calculus II Lab, a continuation of Calculus I, encompasses the study of integration of transcendental functions, techniques of integration, polar coordinates, improper integrals, sequences, and series.

**Corequisites:** MATH 2114

### **Student Learner Objectives**

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Upon successful completion of this course, students will be able to:

- Evaluate definite and indefinite integrals using the Fundamental Theorem of Calculus, substitution, and basic integration rules, and interpret integrals as accumulated change.
- Apply definite integrals to compute areas, volumes (by slicing, disks, and washers), arc length, surface area, work, and average value of a function.
- Use advanced integration techniques—including integration by parts, trigonometric integrals and substitutions, partial fractions, and improper integrals—to solve both theoretical and applied problems.
- Analyze and solve problems involving applications such as moments and centers of mass, fluid pressure and force, and other physical applications modeled by integrals.
- Select and justify appropriate integration methods to model and solve complex problems, and clearly communicate mathematical reasoning and results.

### **Course Materials**

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**Textbook:** *Essential Calculus: Early Transcendentals* by J. Stewart (2nd edition).

### **Grading Policy**

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The grading policy may be amended during the semester at the instructor's discretion.

Course Elements	Percentage
Attendance	50%
Quizzes	50%

## Grading Scale

$90 - 100\% = A$

$80 - 89\% = B$

$70 - 79\% = C$

$60 - 69\% = D$

Below 60% =  $F$

## Classroom Policies

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### Civility in the Classroom

Students are expected to be supportive and encouraging to other students to help create a positive learning environment. Students are expected not to use cell phones, laptops, or other electronic devices in class for any non-course related purposes. Please make every effort to avoid situations that require you to leave before the end of class. However, if you must leave class early, please inform your instructor in advance.

### Academic Dishonesty

Students at Texas A&M University-San Antonio are expected to adhere to the highest standards of academic honesty and integrity. Academic Dishonesty includes cheating, plagiarism, fabrication, multiple submission, misrepresentation of academic records, facilitating academic dishonesty, unfair advantage, violating known safety requirements, and ethical misconduct. All students are responsible for being familiar with the Academic Dishonesty Policy found in the Student Handbook. Your instructor will accept no excuses for any form of academic misconduct.

## List of Topics

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Topics to be covered include but are not limited to:

- Chapter 5: Integrals
- Chapter 6: Techniques of Integration
- Chapter 7: Applications of Integration
- Chapter 8: Series
- Chapter 9: Parametric Equations and Polar Coordinates

## Tentative Schedule

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*The instructor reserves the right to modify/update the topics as appropriate.*

- 5.1 Areas and Distances
- 5.2 The Definite Integral
- 5.3 Evaluating Definite Integrals
- 5.4 The Fundamental Theorem of Calculus
- 5.5 The Substitution Rule
- 6.1 Integration by Parts
- 6.2 Trigonometric Integrals and Substitutions
- 6.3 Partial Fractions
- 6.4 Integration with Tables and Computer Algebra Systems
- 6.5 Approximate Integration
- 7.1 Areas between Curves
- 7.2 Volumes
- 7.3 Volumes by Cylindrical Shells
- 7.4 Arc Length
- 7.5 Area of a Surface of Revolution
- 7.6 Applications to Physics and Engineering
- 7.7 Differential Equations
- 8.1 Sequences
- 8.2 Series
- 8.3 The Integral and Comparison Tests
- 8.4 Other Convergence Tests
- 8.5 Power Series
- 8.6 Representing Functions as Power Series
- 8.7 Taylor and Maclaurin Series
- 8.8 Applications of Taylor Polynomials
- 9.1 Parametric Curves
- 9.2 Calculus with Parametric Curves

- 9.3 Polar Coordinates
- 9.4 Areas and Lengths in Polar Coordinates
- 9.5 Conic Sections in Polar Coordinates