

**MATH C2220 Course Outline as of Fall 2027****CATALOG INFORMATION**

Dept and Nbr: MATH C2220 Title: CALCULUS 2

Full Title: Calculus II: Early Transcendentals

Last Reviewed: 11/24/2025

Units	Course Hours per Week		Nbr of Weeks		Course Hours Total	
Maximum	5.00	Lecture Scheduled	5.00	17.5	Lecture Scheduled	87.50
Minimum	5.00	Lab Scheduled	0	8	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	5.00		Contact Total	87.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 175.00

Total Student Learning Hours: 262.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly: MATH 1B

**Catalog Description:**

A second course in differential and integral calculus of a single variable. Topics include applications of integration, techniques of integration, infinite sequences and series, and the calculus of parametric and polar equations. This course is primarily intended for Science, Technology, Engineering, and Mathematics (STEM) majors.

Additionally at SRJC, students will be introduced to methods of integration, conic sections, polar coordinates, infinite sequences and series, parametric equations, and analytic geometry.

**Prerequisites/Corequisites:**

Calculus I: Early Transcendentals (MATH C2210), or equivalent, or placement as determined by the college's multiple measures assessment process.

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: A second course in differential and integral calculus of a single variable. Topics

include applications of integration, techniques of integration, infinite sequences and series, and the calculus of parametric and polar equations. This course is primarily intended for Science, Technology, Engineering, and Mathematics (STEM) majors.

Additionally at SRJC, students will be introduced to methods of integration, conic sections, polar coordinates, infinite sequences and series, parametric equations, and analytic geometry. (Grade Only)

Prerequisites/Corequisites: Calculus I: Early Transcendentals (MATH C2210), or equivalent, or placement as determined by the college's multiple measures assessment process.

Recommended:

Limits on Enrollment:

Transfer Credit: UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

### **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	B	Communication and Analytical Thinking	Fall 2025	
	L2	Mathematical Concepts & Quantitative Reasoning		
	MC	Math Competency		
	B	Communication and Analytical Thinking	Fall 1981	Fall 2025
	MC	Math Competency		
<b>CSU GE:</b>	<b>Transfer Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	B4	Math/Quantitative Reasoning	Fall 1981	
<b>IGETC:</b>	<b>Transfer Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	2A	Mathematical Concepts & Quantitative Reasoning	Fall 1981	
<b>CSU Transfer:</b>			<b>Effective:</b>	<b>Inactive:</b>
<b>UC Transfer:</b>	Transferable		<b>Effective:</b>	<b>Inactive:</b>
			Fall 1981	

#### **CID:**

CID Descriptor: MATH 230	Multivariable Calculus
SRJC Equivalent Course(s):	MATHC2220 AND MATH1C
CID Descriptor: MATH 900S	Single Variable Calculus Sequence
SRJC Equivalent Course(s):	MATHC2210 AND MATHC2220

#### **Certificate/Major Applicable:**

Major Applicable Course

### **COURSE CONTENT**

#### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Evaluate proper and improper integrals.
2. Define and apply topics from plane analytic geometry, including polar and parametrically defined graphs, conic sections, and vectors.

3. Model and solve application problems using integrals of algebraic and transcendental functions.
4. Determine convergence of sequences and series, and compute and use power series of elementary functions.

### **Objectives:**

Statewide Required Objectives/Outcomes:

At the conclusion of this course, the student should be able to (Identical and Required):

1. Apply integration to find areas and volumes.
2. Evaluate definite and indefinite integrals using a variety of integration formulas and techniques.
3. Use integration to solve applications such as work or length of a curve.
4. Evaluate improper integrals.
5. Determine convergence of sequences and series.
6. Represent functions as power series.
7. Graph, differentiate, and integrate functions in polar and parametric form.

Expanded and Additional Local Objectives:

At the conclusion of this course, the student should be able to:

1. Apply methods of integration, including integration by parts, integrals of inverse functions, trigonometric substitutions and partial fractions, to calculate proper and improper integrals.
2. Apply definite integration to compute volumes, and arc length, and to solve problems in science and related fields.
3. Evaluate integrals with the use of tables or a computer algebra system.
4. Use Trapezoidal and Simpson's Rules to approximate definite integrals.
5. Apply differentiation and integration to parametric representations of graphs, including polar graphs.
6. Determine convergence of sequences and series.
7. Compute power series of functions, their derivatives and integrals.
8. Compute Taylor and Maclaurin series and demonstrate applications to elementary functions.
9. Determine radii and intervals of convergence of power series.

### **Topics and Scope:**

Statewide Required Topics:

1. Applications of integration to areas between curves and volumes, including volumes of solids of revolution
2. Techniques of integration, including integration by parts, trigonometric substitution, and partial fraction decomposition
3. Numerical integration, including trapezoidal and Simpson's rules
4. Improper integrals
5. Additional applications of integration, such as work, arc length, area of a surface of revolution, moments and centers of mass, separable differential equations, growth and decay
6. Introduction to sequences and series
7. Multiple tests for convergence of sequences and series
8. Power series, radius of convergence, interval of convergence
9. Differentiation and integration of power series
10. Taylor series expansion of functions

11. Parametric equations and calculus with parametric curves
12. Polar curves and calculus in polar coordinates

Expanded and Additional Local Topics:

I. Integration

- A. Integration by parts
- B. Integration of inverse functions
- C. Trigonometric integrals
- D. Trigonometric substitutions
- E. Partial fractions
- F. Improper integrals
- G. Numerical integration using Trapezoidal and Simpson's Rules
- H. Evaluation by tables or computer algebra systems

II. Applications of the Integral

- A. Area
- B. Volumes
- C. Arc length
- D. Area of surfaces of revolution
- E. Separable differential equations
- F. Other applications and modeling

III. Topics From Plane Analytic Geometry

- A. Conic sections
- B. Polar coordinates and graphs

IV. Infinite Series

- A. Sequences and series
- B. Convergence tests
- C. Power series
- D. Radii and intervals of convergence
- E. Taylor polynomials and approximations
- F. Derivatives and integrals of power series
- G. Taylor and Maclaurin series

V. Parametric Equations

- A. Tangents, arc length and areas
- B. Tangents and area for polar graphs

**Assignment:**

1. Reading assignments (20-50 pages per week)
2. Problem sets (1-6 per week), such as
  - a. Assignments from required text(s)
  - b. Supplementary materials chosen by the instructor
3. Project(s) (0-10 per term)
  - a. Computer explorations
  - b. Modeling activities
4. Quizzes (0-4 per week)
5. Exams (2-7)
6. Final Exam

Statewide Required Methods of Evaluation:

Students should demonstrate their mastery of the learning objectives and their ability to devise,

organize, and present complete solutions to problems.

Examples of potential methods of evaluation include, but are not limited to, exams, quizzes, homework, classwork, technology-based activities, laboratory work, projects, and research demonstrations.

Methods of evaluation are at the discretion of local faculty.

Expanded and Additional Local Methods of Evaluation: See table below.

### Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing  
0 - 0%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Problem sets

Problem solving  
5 - 20%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations  
0 - 0%

**Exams:** All forms of formal testing, other than skill performance exams.

Quizzes, exams, final exam

Exams  
70 - 95%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Projects

Other Category  
0 - 10%

### Representative Textbooks and Materials:

Statewide Representative Textbooks:

A college level textbook designed for science, technology, engineering and math majors, and supporting the learning objectives of this course.

Representative texts:

- Strang, G., Herman, E., et al. (2016 & Web 2025). Calculus Volume 2. OER: OpenStax. <https://openstax.org/details/books/calculus-volume-2/>
- Stewart, J., et al. (2021). Calculus: Single Variable Calculus Early Transcendentals. 9th ed.: Cengage.

- Briggs, W., et al. (2019). Calculus: Early Transcendentals. 3rd ed.: Pearson.
  - Hass, J., et al. (2023). Thomas' Calculus: Early Transcendentals. 15th ed.: Pearson.
- Texts used by individual institutions and even individual sections will vary.

Additional Local Representative Textbooks:

Stewart, James, Calculus: Early Transcendentals. 8th ed. Cengage Learning. 2016. (classic).