TAFTCOLLEGE

Reviewed by: J. Reynolds
Reviewed by: S. Getty
Reviewed by: M. Mayfield
C&GE Approval: October 24, 2025
Board Approval: November 12, 2025
Semester Effective: Fall 2026

Mathematics (MATH) C2221 Calculus II: Late Transcendentals (4 Units) CSU:UC
[formerly Mathematics 3B, formerly Math 2120]

Prerequisite: Calculus I: Late Transcendentals (MATH C2211), or equivalent, or placement as determined by the college's multiple measures assessment process.

Co-Requisites: None

Total Hours: 64 hours lecture. 128 Outside of class hours. (192 Total Student Learning Hours)

Catalog Description:
Part 1 (Identical and Required):
-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.

Part 2 (Optional Expanded Description, Local College Discretion): C-ID: MATH 221

Type of Class/Course: Degree Credit

Part 1 (Identical and Required):
Representative Texts, Manuals, OER, and Other Support Materials: 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 1. OER: OpenStax. https://openstax.org/details/books/calculus-volume-1/
• Stewart, J., et al. (2021). Calculus. 9th ed.: Cengage.
• Briggs, W., et al. (2019). Calculus. 3rd ed.: Pearson.
• Hass, J., et al. (2023). Thomas' Calculus. 15th ed.: Pearson.
Texts used by individual institutions and even individual sections will vary.

Part 2 List Sample Textbooks, Manuals, or Other Support Materials (optional):

Additional Instructional Materials:

Briggs, W., et al. (2019). My Math Lab -Access Code- for Calculus. 3rd ed.: Pearson.

Course Objectives:

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

Part 1 (Identical and Required):
At the conclusion of this course, the student should be able to (Identical and Required):

1. Evaluate indeterminate forms using L'Hôpital's Rule.
2. Find derivatives of transcendental functions.
3. Evaluate definite and indefinite integrals using a variety of integration formulas and techniques.
4. Use integration to solve applications such as work or length of a curve.
5. Evaluate improper integrals.
6. Determine convergence of sequences and series.
7. Represent functions as power series.
8. Graph, differentiate, and integrate functions in polar and parametric form.

Part 2 Optional objectives/outcomes (optional):
At the conclusion of this course, the student should be able to:

Course Student Learning Outcomes:

1. Apply integration to physical problems.
2. Differentiate and Integrate functions of parametric equations and polar coordinates.
3. Apply an infinite series to a physical problem.

General Education Student Learning Outcomes:

1. Students will apply quantitative information to draw reasonable conclusions to real world situations and possess numerical literacy.

Course Scope and Content:

Part 1: Required Topics (Identical):

1. Derivatives and integrals of inverse functions and transcendental functions, including inverse trigonometric, exponential, or logarithmic functions
2. Indeterminate forms and L'Hôpital's Rule
3. Techniques of integration, including integration by parts, trigonometric substitution, and partial fraction decomposition
4. Numerical integration, including trapezoidal and Simpson's rules
5. Improper integrals
6. Additional applications of integration, such as work, volumes, arc length, area of a surface of revolution, moments and centers of mass, separable differential equations, growth and decay
7. Introduction to sequences and series
8. Multiple tests for convergence of sequences and series
9. Power series, radius of convergence, interval of convergence
10. Differentiation and integration of power series
11. Taylor series expansion of functions
12. Parametric equations and calculus with parametric curves
13. Polar curves and calculus in polar coordinates

Representative Assignments

Reading: Students will read the appropriate sections of the textbook and worked out example problems.

Writing: Students will communicate in writing clearly and accurately in support of their written calculations.

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 8 hours per week outside of the regular class time doing the following:

1. Studying
2. Answering questions
3. Skill practice
4. Completing required reading
5. Problem solving activity or exercise

Methods of Instruction:
1. Lecture demonstrations and sample problems. ~~solved by the instructor~~

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.

Supplemental Data:

TOP Code:	170100 Mathematics
SAM Priority Code:	E: Non-Occupational
Funding Agency:	Y: Not Applicable
Program Status:	1: Program Applicable
Distance Education:	Online;Offline
Noncredit Category:	Y: Not Applicable
Special Class Status:	N: Course is not a special class

Basic Skills Status:	N: Not Applicable
Prior to College Level:	Y: Not Applicable
Cooperative Work Experience:	N: Course is not a part of a cooperative education program
Eligible for Credit by Exam:	Yes
Eligible for Pass/No Pass:	Yes
Discipline:	Mathematics