TAFTCOLLEGE

Reviewed by: S. Getty
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Mathematics (MATH) C2211 Calculus I: Late Transcendentals (5 Units) CSU:UC
[formerly Mathematics 3A, formerly Mathematics 2100]

Prerequisite: Pre-calculus, or college algebra and trigonometry, or equivalent, or placement as determined by the college's multiple measures assessment process.

Co-Requisites: None

Total Hours: 80 hours lecture. 160 Outside of class hours. (240 Total Student Learning Hours)

Catalog Description:-Part 1 (Identical and Required):
A first course in differential and integral calculus of a single variable. Topics include limits and continuity of functions, techniques and applications of differentiation, an introduction to integration, and the Fundamental Theorem of Calculus. This course is primarily intended for Science, Technology, Engineering, and Mathematics (STEM) majors.

Part 2 (Optional Expanded Description, Local College Discretion): C-ID: MATH 211

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:

By the end of the course, a successful student 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. Compute the limit of a function.
2. Determine the continuity of a function.
3. Find the derivative of a function as a limit.
4. Find the equation of a tangent line to the graph of a function.
5. Compute derivatives using differentiation formulas.
6. Use differentiation to solve applications such as related rate problems and optimization problems.
7. Use implicit differentiation.
8. Graph functions using methods of calculus.
9. Evaluate a definite integral as a limit.
10. Evaluate integrals using the Fundamental Theorem of Calculus.
11. Apply integration to find areas and volumes.

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

Course Student Learning Outcomes:
1. Calculate limits.
2. Calculate and interpret instantaneous rates of change.
3. Calculate the area under a curve.

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. Limits: intuitive and precise definitions; computation using numerical, graphical, and algebraic approaches
2. Continuity and differentiability of functions
3. Derivative as a limit
4. Interpretation of derivatives as slopes of tangent lines and rates of change
5. Differentiation formulas: constants, power rule, product rule, quotient rule, and chain rule
6. Derivatives of trigonometric functions
7. Implicit differentiation, differentiation of inverse functions
8. Applications of differentiation, including related rates and optimization
9. Higher-order derivatives
10. Maximum and minimum values, Extreme Value Theorem
11. Graphing functions using first and second derivatives, concavity, and asymptotes
12. Mean Value Theorem
13. Antiderivatives and indefinite integrals
14. Definite integrals as limits of Riemann sums
15. Interpretation of the integral as area under a curve and net change
16. Basic integration rules and properties of integrals

17. Fundamental Theorem of Calculus
18. Integration by substitution
19. Applications of integration to areas between curves and volumes, including volumes of solids of revolution

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 10 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 with and without computer assistance

Methods of Instruction:

1. Lecture-demonstrations and sample problems

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

Distance Education:	Online; Offline
Program Status:	1: Program Applicable
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