California Community Colleges

PHASE IIB CCN TEMPLATE
Developed by CCN Workgroup,
based on CCN Council recommendations
Date: 6-16-2025

Phase IIB CCN TEMPLATE

Background

- This CCN Course Template was developed by Mathematics discipline faculty representatives from the California Community Colleges, California State University, University of California and independent colleges and universities during October-December 2024, using C-ID MATH 210 as a starting point.
- Development of the CCN Course Template was facilitated by ASCCC with advisory input from segment articulation officers and transfer experts.
- Approved and Submitted to the Chancellor's Office: June 2025

Subject: Mathematics	**Subject Code:** MATH
Proposed Course Number (Identical): C2210	
Course Title (Identical): Calculus I: Early Transcendentals	
Catalog/Course Description (Identical): **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):**	

Minimum Unit Threshold | 4.0 Semester Units Unit amounts must adhere to the established minimum.
Prerequisites (Identical): Pre-calculus, or college algebra and trigonometry, or equivalent, or placement as determined by the college's multiple measures assessment process.
Co-Requisites (Identical): None
Other Limitations on Enrollment (determined locally)
Advisories/Recommended Preparation (determined locally)

Course 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 transcendental functions including trigonometric, exponential, and logarithmic
7. Implicit differentiation, differentiation of inverse functions, including inverse trigonometric functions
8. Applications of differentiation, including related rates and optimization
9. Higher-order derivatives
10. Indeterminate forms and L'Hôpital's Rule
11. Maximum and minimum values, Extreme Value Theorem
12. Graphing functions using first and second derivatives, concavity, and asymptotes
13. Mean Value Theorem
14. Antiderivatives and indefinite integrals
15. Definite integrals as limits of Riemann sums
16. Interpretation of the integral as area under a curve and net change
17. Basic integration rules and properties of integrals
18. Fundamental Theorem of Calculus
19. Integration by substitution

Part 2: Optional Expanded or Additional Topics (optional):

Laboratory Content (if applicable) N/A

Course Objectives/Outcomes

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 and evaluate indeterminate forms using L'Hôpital's Rule.
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 and find derivatives of transcendental functions.
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.

Part 2 Optional objectives/outcomes (optional):

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

Methods of Evaluation

Part 1 (Identical and Required):

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.

Part 2 List Additional Methods of Evaluation (Optional):

Representative Texts, Manuals, OER, and Other Support Materials

Part 1 (Identical and Required):

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: 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.

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

Date Approved:

June 16, 2025, following ASCCC facilitation of template development process, including engagement of faculty discipline representatives from California Community Colleges, California State University, University of California, and independent colleges and universities and advisory input from segment articulation officers and transfer experts.