Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: MATH 201 **Year: 2025-2026**

Course Title: Calculus I **Credit Hours: 4**

I. Course Description: This is a first course in calculus for all disciplines. Topics include limits, continuity, derivatives, and anti-derivatives of algebraic, trigonometric, logarithmic, and exponential functions. Applications include sketching, area under the curve, optimization problems and related rates. An in-person, proctored final exam is required for all online offerings of this course. MATH 201 fulfills the SUNY General Education Mathematics Knowledge and Skills Area. Prerequisites: C or better grade in MATH 138 or appropriate placement.
4 Cr. (4 Lec.) Fall and spring semesters.

II. Additional Course Information:

1. MATH 201 is required in the following A.S. programs: Liberal Arts - Math Science, Computer Science, Computer Science - Engineering, .and Engineering Science. The course is a requirement option for Biology A.S.
2. MATH 201 can be used in many programs to fulfill the math requirement.
3. A TI30XS calculator or other graphing calculator is recommended.

III. Student Learning Outcomes

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

1. Analyze mathematical equations from descriptions and/or graphs.
2. Explain the derivative and calculate the derivative for any function.
3. Apply the derivative in multiple ways, including finding the equation of a tangent line, graphing a function accurately, calculating related rates, and minimizing and maximizing area, volume, surface area, and cost.
4. Explain the anti-derivative/integral and calculate the exact area under the curve.

IV. Tompkins Cortland Institutional Learning Outcomes; Program Learning Outcomes; SUNY General Education Competencies and Knowledge and Skills Areas

Tompkins Cortland ILOs

Complete this section for “service” courses only (e.g., courses that are required of all students; courses that are not program specific but satisfy liberal arts requirements; or commonly used in multiple academic programs to meet non-program-specific requirements). Check only Institutional Learning Outcomes (ILOs) that are meaningfully developed and assessed in this course. For each ILO chosen, include the SLO to which it aligns.

Students will:
☐ Communicate effectively, in oral and written forms, taking into consideration audience and purpose.

☒ Apply principles and methods of scientific inquiry and quantitative reasoning appropriate to their discipline.

SLOs:

1. Analyze mathematical equations from descriptions and/or graphs.
3. Apply the derivative in multiple ways, including finding the equation of a tangent line, graphing a function accurately, calculating related rates, and minimizing and maximizing area, volume, surface area, and cost.

☒ Use information, critical thinking, and the creative process to solve problems and reach conclusions.

SLOs:

1. Analyze mathematical equations from descriptions and/or graphs.
2. Explain the derivative and calculate the derivative for any function.
3. Apply the derivative in multiple ways, including finding the equation of a tangent line, graphing a function accurately, calculating related rates, and minimizing and maximizing area, volume, surface area, and cost.4. Explain the anti-derivative/integral and calculate the exact area under the curve

☐ Use technology appropriate to their discipline.

☐ Describe the ways in which social, economic, or environmental sustainability depends on their own and the collective contributions of a diversity of ideas and people.

Program Learning Outcomes N/A

Complete this section for program-specific courses (e.g., those that share the same discipline code as the academic program or satisfy requirements in related programs). List the academic program(s) here and note which Student Learning Outcomes align to specific Programmatic Learning Outcomes. Please see the MCS Instructions for more details.

SUNY General Education Competencies

If this course assesses a SUNY GEN ED Competency, check all that apply and indicate which course outcome(s) address each checked item:

☒ CRITICAL THINKING & REASONING- Students will:

a. clearly articulate an issue or problem;
b. identify, analyze, and evaluate ideas, data, and arguments as they occur in their own or others' work; acknowledge limitations such as perspective and bias; and
c. develop well-reasoned (logical) arguments to form judgments and/or draw conclusions.

Course SLO(s):

1 Analyze mathematical equations from descriptions and/or graphs
2 Explain the derivative and calculate the derivative for any function.
3. Apply the derivative in multiple ways, including finding the equation of a tangent line, graphing a function accurately, calculating related rates, and minimizing and maximizing area, volume, surface area, and cost.
4. Explain the anti-derivative/integral and calculate the exact area under the curve.

☐ INFORMATION LITERACY - Students will:

a. locate information effectively using tools appropriate to their need and discipline; evaluate information with an awareness of authority, validity, and bias; and demonstrate an understanding of the ethical dimensions of information use, creation, and dissemination.

☒ SUNY GENERAL EDUCATION KNOWLEDGE AND SKILLS AREA(s): **Mathematics (and Quantitative Reasoning)**
For courses that are approved to meet one (or more) of the ten SUNY General Education Knowledge and Skills Areas, indicate which area the course fulfills, and which outcome(s) are aligned with the SUNY outcomes for that area:

SUNY SLO: Students will demonstrate the ability to interpret and draw inferences from mathematical models such as formulas, graphs, tables, or schematics

Course SLO(s):

1. Analyze mathematical equations from descriptions and/or graphs
3 Apply the derivative in multiple ways, including finding the equation of a tangent line, graphing a function accurately, calculating related rates, and minimizing and maximizing area, volume, surface area, and cost.

SUNY SLO: Students will demonstrate the ability to represent mathematical information symbolically, visually, numerically or verbally as appropriate.

Course SLO(s):

1. Analyze mathematical equations from descriptions and/or graphs
2. Explain the derivative and calculate the derivative for any function.
3. Apply the derivative in multiple ways, including finding the equation of a tangent line, graphing a function accurately, calculating related rates, and minimizing and maximizing area, volume, surface area, and cost.
4. Explain the anti-derivative/integral and calculate the exact area under the curve.

SUNY SLO: Students will demonstrate the ability to employ quantitative methods such as arithmetic, algebra, geometry, or statistics to solve problems.

Course SLO(s):

1. Analyze mathematical equations from descriptions and/or graphs
2. Explain the derivative and calculate the derivative for any function.
3. Apply the derivative in multiple ways, including finding the equation of a tangent line, graphing a function accurately, calculating related rates, and minimizing and maximizing area, volume, surface area, and cost.
4. Explain the anti-derivative/integral and calculate the exact area under the curve.

☐ This course does not address any of the above Tompkins Cortland ILOs, PLOs, or SUNY General Education Competencies or Knowledge and Skills Areas.

V. Essential Topics/Themes

1. Review of functions, graphs, and trigonometry
2. Limits and Continuity
3. Derivatives as Slopes and Rates of Change
4. Rules of Differentiation, Product and Quotient Rule, Writing the Equation of a Tangent Line
5. Chain Rule and Implicit Differentiation
6. Related Rates
7. Extrema and the Mean Value Theorem
8. First and Second Derivative Tests, Limits at Infinity, Curve Sketching
9. Optimization Problems
10. Differentials, Anti-Derivatives/Integration, Area, and Riemann Sums
11. The Fundamental Theorem of Calculus and the Mean Value Theorem for Integrals
12. Exponential Differentiation and Integration

13. Logarithmic Differentiation and Integration
14. Trigonometric and Inverse Trig Differentiation and Integration

VI. Methods of Assessment/Evaluation

Method	% Course Grade
1. Homework /Quizzes	15 - 30%
2. Exams	40– 50%
3. Final Exam	15 – 25%
4. Other (attendance, group work, projects, participation)	0 – 10%

VII. Texts – ☐ Required ☒ Recommended ☒ Used for more than one course (list courses)

MATH 201, 202, & 203 (Calculus I, II, and III)

High school instructors may consult with staff in the CollegeNow office for additional information and guidance.

	OER
1. Calculus, Larson, Hostetler, Edwards. 10th Edition, 2014, Houghton Mifflin	☐
2. Lumen Calculus I https://courses.lumenlearning.com/calculus1/	☒
3. Open Stax Calculus Volume I https://openstax.org/details/books/calculus-volume-1	☒

Editions listed are current as of date of syllabus. More recent editions may be used.

VIII. Bibliography of Supplemental Materials – None specified

IX. Other Learning Resources

Audiovisual: None specified
Electronic: None specified
Other: None specified

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for academic adjustments. All course materials are available in alternate formats upon request.*

Revised 02-23/D. Bethoney

Academic Integrity: *Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of his or her academic work: in writing papers and reports, in taking examinations, in performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.*

Any written work submitted by a student must be his or her own. If the student uses the words or ideas of someone else, he or she must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.

Several degree programs offer student learning opportunities (such as internships, field work, and clinical experiences) outside the standard classroom setting. As part of the learning process, students must understand and engage in conduct that adheres to principles guiding employment within the professional workplace. These behaviors include, but are not limited to, academic integrity, accountability, reliability, respect, use of appropriate language and dress, civility, professional ethics, honesty, and trustworthiness. Disciplinary action may be initiated for inappropriate conduct occurring while participating in any course-related project or event.