

Columbus State Community College

Mathematics Department Syllabus

Course and Number: MATH 1151 – Calculus I **Credits:** 5 **Class Hours Per Week:** 5

Prerequisites: MATH 1149 or 1150 with a C or higher

COURSE DESCRIPTION: Introduction to differential calculus: functions, limits, continuity, derivatives, differentiation rules, derivatives of the trigonometric, exponential, and logarithmic functions, related rates, extrema, curve sketching, and optimization. Introduction to integral calculus: antiderivatives, definite integral, Riemann sums, area under a curve, Fundamental Theorem of Calculus, numerical integration, integration by substitution, and derivatives and integrals of inverse trigonometric, hyperbolic, and inverse hyperbolic functions. Applications to problems in science and engineering.

COURSE GOALS: To introduce the student to the concepts, methods, and applications of differential and integral calculus necessary for further study in calculus, science, and engineering; to promote the further development of the student's algebraic, numerical, graphical, and communication skills; to develop student's mathematical thinking and problem solving ability; and to facilitate student's progression from a procedural/computational understanding of mathematics to a broader understanding encompassing logical reasoning, generalization, abstraction, and formal proof.

INSTITUTIONAL LEARNING GOALS: Critical Thinking and Quantitative Skills

TEXTBOOK, MANUALS, REFERENCES, AND OTHER REQUIRED MATERIALS

- Calculus: Early Transcendental Functions, 7th Edition, Larson/Edwards, Cengage Learning, 2019.
- A graphing calculator is recommended. The TI-89, TI-92, TI-Nspire CAS, and other Computer Algebra Systems (CAS) are never allowed during proctored assessments.

UNITS OF INSTRUCTION

- Limits and Continuity (Sections 2.2-2.5, 4.5)
- The Derivative and Methods of Differentiation (Sections 3.1-3.6)
- The Derivative in Graphing and Applications (Sections 3.7, 3.8, 4.1-4.4, 4.6-4.8, 5.6)
- Integration (Sections 5.1-5.5, 5.7-5.9, 8.6)

GENERAL INSTRUCTIONAL METHODS: Instructional methods may include face-to-face or video lectures or demonstration, face-to-face or virtual discussion, individual or group activities including the use of visual aids, computers and/or other technologies. Students may be expected to participate in these activities during class and/or outside of class. Instructors may require class participation, collaborative learning, and peer review.

STANDARDS AND METHODS FOR EVALUATION: The final examination will be weighted between 25% and 33% (inclusive) of the course grade. The remainder of the course grade will be determined by the instructor.

GRADING SCALE:

Letter grades for the course will be awarded using a 90% - 80% - 70% - 60% scale. Grades will NOT be curved, skewed, or otherwise inflated.