



# Calculus

Calculus is a fourth-year mathematics course option for students who have completed Precalculus. The course provides students with the opportunity to develop an understanding of the derivative and its applications, as well as the integral and its applications. Throughout the course, there is a focus on notational fluency and the use of multiple representations. Calculus includes the study and analysis of limits and continuity as applied to a variety of functions; the derivative as related to limits and continuity; various derivative rules such as product, quotient, and chain; applications of the derivative including curve analysis, applied max/min situations, related rate problems, and use of Mean Value Theorem; the definite integral as a limit of Riemann sums; properties of definite integrals; the Fundamental Theorem of Calculus as it relates derivatives and integrals; techniques of integration including u-substitution; and applications of the integral including solving separable differential equations, finding a particular solution curve given an initial condition, area between curves on a coordinate plane, and average value situations. Topics are analyzed in multiple ways, including verbal and written, numerical, algebraic, and graphical presentations. Instruction and assessment include the appropriate use of technology.