Calculus I Syllabus

College of the Atlantic

Course Name: Calculus I
Course Number: ES1024I
Textbook: Hughes-Hallet, et al, *Calculus: Single Variable*, J Wiley. Instructor: David Feldman
Frequency: Offered Every Other Year
Times: Meets three times a week for one hour. Several optional weekly problem-solving sessions.
Evaluation: Weekly problem sets, two take-home exams

Topics Covered:

- **Review of Functions**

    - Linear functions
    - Exponential functions
    - Logarithmic functions
    - Trigonometric functions
    - Powers, polynomials, and rational functions
    - Compositions and other combinations of functions

- **The Derivative**

    - Instantaneous velocity
    - Limits
    - The derivative at a point
    - The derivative function
    - Interpretations of the derivative
    - The second derivative
    - Differentiability

- **Techniques of Differentiation**

    - Powers and polynomials
    - Exponential functions
    - Product and quotient rules
    - Chain rule
    - Trigonometric functions
    - Chain rule and inverse functions, logarithms
    - Implicit differentiation
    - Local linearization

- **Applications of the Derivative**

    - Families of curves
    - Introduction to optimization
    - Economics and marginality
    - Optimization and modeling
    - Related rates