Wayland High School

Mathematics Department
BC Calculus
Curriculum Guide

Unit 1: Limits and Continuity
- Limits
- The Squeeze theorem
- Limits involving infinity and asymptotes
- Continuity at a point

Unit 2: Derivatives
- The definition of the derivative
- Differentiability
- Rules of differentiation
- Velocity and other rates of change
- Derivatives of functions
- Implicit differentiation
- The Chain Rule

Unit 3: Applications of the Derivative
- Existence Theorems
- Function analysis
- Optimization
- Related Rates of Change
- Linearization and Newton's Method

Unit 4: Introduction to Integration
- Estimating with finite sums
- Definite integrals
- Indefinite integrals and antidifferentiation
- Fundamental Theorem of Calculus (parts I and II)
- Slope fields

Unit 5: Integration
- Integration using substitution
- Integration by parts
- Integration using other methods, including completing the square, long division and partial fractions
- Exponential growth and decay
- Logistic growth
- Numerical methods including Euler's method

Unit 6: Applications of Integration
- Integration as net change
- Area and volume including the disk method
- Arc length
- L'Hôpital's Rule
- Relative rates of growth
- Improper integrals

Unit 7: Infinite Series
- Power Series
- Taylor and Maclaurin Series
- Convergence tests
- Taylor's Theorem and LaGrange error bounds

Unit 8: Polar and Parametric Functions
- Vectors in the plane
- Vector valued functions
- Modeling projectile motion
- Polar coordinates and graphs
- Calculus of polar curves
- Area of polar curves

Unit 9: Review