

Course Syllabus

Description:

Comparable to college and university calculus, this course will help prepare you for the Calculus AB Advanced Placement exam. This course meets one required math credit for high school graduation.

Estimated Completion Time: 2 segments / 32-36 weeks

Major Topics and Concepts:

Segment I:

Module 00 Getting Started

- 00.01 Things to Know
- 00.02 Navigation
- 00.03 Lessons and Assessments
- 00.04 Course Specifics
- 00.05 Online Learning 101
- 00.06 Pace
- 00.07 Academic Integrity

Module 01: Functions

- 01.00 Module One Checklist and Pretest
- 01.01 Course Introduction
- 01.02 Introduction to Calculus
- 01.03 Review of Function Terminology and More
- 01.04 Graphing Calculators
- 01.05 Compositions and Transformations of Functions
- 01.06 Some Common Functions
- 01.07 Discussion-Based Assessment or Collaborative Lesson
- 01.08 Module One Practice Test
- 01.09 Module One Test Part 1
- 01.09 Module One Test Part 2

Module 02: Limits and Continuity

- 02.00 Module Two Checklist and Pretest
- 02.01 Introduction to Limits
- 02.02 Properties of Limits
- 02.03 Limits Involving Infinity
- 02.04 Continuity
- 02.05 Applications of Limits
- 02.06 Discussion-Based Assessment or Collaborative Lesson
- 02.07 Module Two Practice Test
- 02.08 Module Two Test Part 1
- 02.08 Module Two Test Part 2

Module 03: Differentiation

- 03.00 Module Three Checklist and Pretest

- 03.01 The Derivative
- 03.02 Rules of Differentiation
- 03.03 Trigonometric Derivatives and the Chain Rule
- 03.04 Inverse Functions
- 03.05 Exponential and Logarithmic Functions
- 03.06 Derivatives of Exponential, Logarithmic, and Inverse Trig Functions
- 03.07 Implicit Differentiation
- 03.08 Discussion-Based Assessment or Collaborative Lesson
- 03.09 Module Three Practice Test
- 03.10 Module Three Test Part 1
- 03.10 Module Three Test Part 2

Module 04: Applications of Derivatives

- 04.00 Module Four Checklist and Pretest
- 04.01 Analyzing Functions Part I: Curve Sketching
- 04.02 Analyzing Functions Part II: Maximums and Minimums
- 04.03 Applied Maximum and Minimum Problems
- 04.04 Distance, Velocity, Acceleration, and Rectilinear Motion
- 04.05 Related Rates
- 04.06 The Mean-Value Theorem and L'Hôpital's Rule
- 04.07 Linearization
- 04.08 Discussion-Based Assessment or Collaborative Lesson
- 04.09 Module Four Practice Test
- 04.10 Module Four Test Part 1
- 04.10 Module Four Test Part 2
- 04.11 Segment One Practice Exam
- 04.12 Segment One Exam Part 1
- 04.12 Segment One Exam Part 2

Segment II

Module 05: Integration

- 05.00 Module Five Checklist and Pretest
- 05.01 Area Approximation and Riemann Sums
- 05.02 Introduction to the Definite Integral
- 05.03 The Fundamental Theorem of Calculus
- 05.04 Integrals and Antiderivatives
- 05.05 Integration by Substitution
- 05.06 The Definite Integral
- 05.07 Discussion-Based Assessment or Collaborative Lesson
- 05.08 Module Five Practice Test
- 05.09 Module Five Test Part 1
- 05.09 Module Five Test Part 2

Module 06: Application of Integrals

- 06.00 Module Six Checklist and Pretest
- 06.01 Finding the Area Under and Between Curves
- 06.02 Volume by Discs (Slicing)
- 06.03 Average Value of a Function and Rectilinear Motion Revisited
- 06.04 Discussion-Based Assessment or Collaborative Lesson
- 06.05 Module Six Practice Test

- 06.05 Module Six Practice Test
- 06.06 Module Six Test Part 1
- 06.06 Module Six Test Part 2

Module 07: Differential Equations and More Riemann Sums

- 07.00 Module Seven Checklist and Pretest
- 07.01 Differential Equations—An Introduction
- 07.02 Initial Value Problems and Slope Fields
- 07.03 Numerical Approximation Methods with Integrals
- 07.04 Discussion-Based Assessment or Collaborative Lesson
- 07.05 Module Seven Practice Test
- 07.06 Module Seven Test Part 1
- 07.06 Module Seven Test Part 2

Module 08: Supplemental Topics

- 08.00 Module Eight Checklist and Pretest
- 08.01 Exploring the Graphs of f , f Prime, and f Double Prime
- 08.02 Relative Rates of Growth
- 08.03 Using Calculus with Data in a Table
- 08.04 Functions Defined by Integrals
- 08.05 Discussion-Based Assessment or Collaborative Lesson
- 08.06 Module Eight Practice Test
- 08.07 Module Eight Test Part 1
- 08.07 Module Eight Test Part 2
- 08.08 Segment Two Practice Exam
- 08.09 Segment Two Exam Part 1
- 08.09 Segment Two Exam Part 2

Module 09: Exam Preparation

- 09.00 Module Nine Checklist
- 09.01 Test Format—MC Part A
- 09.02 Using a Calculator—MC Part B
- 09.03 The Free Response Section
- 09.04 Common Mistakes. How Is the Exam Scored?

Course Assessment and Participation Requirements:

To achieve success, students are expected to submit work in each course weekly. Students can learn at their own pace; however, “any pace” still means that students must make progress in the course every week. To measure learning, students complete self-checks, practice lessons, multiple choice questions, projects, discussion-based assessments, and discussions. Students are expected to maintain regular contact with teachers; the minimum requirement is monthly. When teachers, students, and parents work together, students are successful.

