

Aviation High School 2025-2026

AP Calculus BC Syllabus

MCN11XBC

September 04, 2025 to June 26, 2026
AP Calculus AB Exam Date: Thursday, May 21, 2026

Teacher Information

Teacher	Email
Mr. Bohdanowycz	rbohdanowycz@schools.nyc.gov

General Information

Course Description

AP Calculus BC is an introductory college-level calculus course for high school seniors/upperclassmen. In AP Calculus BC, students cultivate and hone their understanding of differential and integral Calculus. Students will apply differential and integral Calculus to real-world problems represented graphically, numerically, analytically, and verbally. Students will apply definitions and theorems to build arguments and justify conclusions as they explore concepts like change, limits, and the analysis of functions. Topics covered in the course include but are not limited to: limits and continuity, differentiation, applications of differentiation, integration and accumulation of change, applications of integration and differential equations.

Prerequisites

Before studying Calculus, all students must complete the equivalent of four years of secondary mathematics designed for college-bound students: Algebra 1, Geometry, Algebra 2 and Pre-Calculus. Students enrolled in AP Calculus BC should have a strong foundation in reasoning with algebraic symbols, working with algebraic structures, be familiar with the properties of functions, the composition of functions, the algebra of functions, and the graphs of functions. In addition, students must also understand the language of functions (domain and range, odd and even, periodic, symmetry, zeros, intercepts, and descriptors such as increasing and decreasing). Students should also know how the sine and cosine functions are defined from the unit circle and know the values of the trigonometric functions.

Course Credits

Classes are 45-minutes daily for **two high school credits**. College credits are contingent on the student's AP exam score and the higher learning institution the student attends. Please visit <https://tinyurl.com/3s6t2mue> to use the College Board AP Credit Policy Search.

Expectations and Goals

Students are expected to arrive to class prepared and on time, actively participate during independent practice and in small group and whole class discussions, complete and submit assignments in a timely manner, prepare and study for formative and summative assessments, utilize technological tools as directed by their teacher (that

includes graphing calculators and geometry software), and adhere to academic integrity by avoiding cheating and plagiarism. The goal is for students to apply and build on the skills they acquired in their high school math career and Pre-Calculus to master and apply the techniques learned in Calculus.

Course Information and Materials

Course Objectives (Aligned to the College Board Course Framework)

AP Calculus AB course units and their corresponding objectives are outlined below:

Unit 1: Limits and Continuity (AP Exam Weight 4-7%)

Main Objectives:

- Estimating & determining an exact limit from different modalities: graphically, tabular and analytically
- Testing continuity and justifying continuity/discontinuity using appropriate definitions
- Justifying arguments with the Squeeze Theorem and the Intermediate Value Theorem (IVT)

Unit 2: Differentiation: Definition and Fundamental Properties (AP Exam Weight 4-7%)

Main Objectives:

- Distinguishing between average and instantaneous rate of change, and estimating derivatives
- Connecting Differentiability and Continuity
- Determining derivatives using limit definitions
- Determining derivatives with the use of rules: power, product & quotient rules
- Determining the derivative of trigonometric and logarithmic functions
- Writing Equations of Tangent lines

Unit 3: Differentiation: Composite, Implicit, and Inverse Functions (AP Exam Weight 4-7%)

Main Objectives:

- Determining derivatives with the chain rule
- Determining the derivative of implicit functions
- Determining the derivative of Inverse Functions
- Determining higher-order derivatives
- Writing Equations of Tangent lines

Unit 4: Contextual Application of Differentiation (AP Exam Weight 6-9%)

Main Objectives:

- Applying differentiation to particle motion problems, nonmotion problems, time related problems (related rates)
- Applying equations of tangent lines to approximate values (linear approximation)
- Applying L'Hôpital's Rule to determine indeterminate limits

Unit 5: Analytical Applications of Differentiation (AP Exam Weight 8-11%)

Main Objectives:

- Applying the Mean Value Theorem (MVT) in analytical problems and apply MVT to justify arguments
- Applying the Extreme Value Theorem (EVT) in analytical problems and apply EVT to justify arguments
- Applying differentiation (1st & 2nd derivative) to determine the features (inc/dec, relative and absolute extrema, concavity) of a function analytically and graphically
- Connecting the graph of a function, its first derivative & its second derivative
- Applying EVT to solve optimization problems

Unit 6: Integration and Accumulation of Change (AP Exam Weight 17-20%)

Main Objectives:

- Determining antiderivatives of polynomial, trigonometric & logarithmic functions using rules and special techniques (e.g. u-substitution, long division)
- Approximating the area under a curve with Riemann Sums

- Riemann Sums, summation notation & definite integral notation
- Determining the exact area under a curve with geometric formulas and using the Fundamental Theorem of Calculus
- Properties of Definite Integrals
- Applying the Fundamental Theorem of Calculus Parts 1 & 2
- Determining the average value of a function
- Determining improper integrals

Unit 7: Differential Equations & Slope Fields (AP Exam Weight 6-9%)

Main Objectives:

- Solving differential equations (general and particular) using separation of variables
- Sketching and reasoning with slope fields
- Using Euler's method to approximate values on a particular solution curve
- Deriving and applying exponential and logistic models

Unit 8: Applications of Integration (AP Exam Weight 6-9%)

Main Objectives:

- Using accumulation functions and definite integrals in applied contexts
- Connecting position, velocity and acceleration of functions using integrals
- Determining the area between curves expressed in terms of x & y
- Determining the volume of solids with known cross sections
- Determining the volume of solids after a revolution (x -axis/horizontal lines and y -axis/vertical lines) with the use of the Disc Method or Washer Methods
- Determining the length of a planar curve using a definite integral

Unit 9: Parametric Function, Polar Coordinates, and Vector Valued- Functions (AP Exam Weight 11-12%)

- Finding derivatives of parametric functions and vector-valued functions
- Calculating the accumulation of change in length over an interval using a definite integral
- Determining the position of a particle moving in a plane
- Calculating velocity, speed, and acceleration of a particle moving along a curve
- Finding derivatives of functions written in polar coordinates
- Finding the area of regions bounded by polar curves

Unit 10: Infinite Sequences and Series (AP Exam Weight 17-18%)

- Applying limits to understand convergence of infinite series
- Types of series: Geometric, harmonic, and p -series
- A test for divergence and several tests for convergence
- Approximating sums of convergent infinite series and associated error bounds
- Determining the radius and interval of convergence for a series
- Representing a function as a Taylor series or a Maclaurin series on an appropriate interval

In addition to the course-specific objectives above, this course will adhere to the mathematical practices outlined by the College Board:

1. Implementing Mathematical Processes: Determine expressions and values using mathematical procedures and rules.
2. Connecting Representations: Translate mathematical information from a single representation or across multiple representations.
3. Justification: Justify reasoning and solutions.
4. Communication and Notation: Use correct notation, language, and mathematical conventions to communicate results or solutions.

Required Materials

All students must come prepared to class every day with at least two blue or black pens, pencils, a graphing calculator and an 8 ½" by 11" notebook or loose-leaf binder for each subject. Students must have a separate notebook or section in their binder dedicated to each class they attend. Notebooks will be checked periodically, so it is important that students be neat and organized.

Attendance Policy

Students must attend class every day. If a student is out for three or more consecutive days, a note must be brought into the student's Counselor on the day they return to class. It is the student's responsibility to make up all missed assignments or exams, even for excused absences.

Aviation High School Grading Policy

- Exams, Quizzes & Projects: 60%
- Classwork: 20%
- Homework: 20%

Assessment Policy

All classes will have a minimum of two assessments per marking period. All classes will have a midterm exam in January and a Final exam in June.

The unauthorized use of "AI" software on any assignment is considered plagiarism and will not be accepted. Students must produce their own work.

Make-Up Work Policy

Students may submit work up to 3 days beyond the assignment deadline. Students who were absent will have 3 days to submit missed assignments from the date they return. Any extension on late assignments beyond 3 days is entirely at the teacher's discretion and will need to be arranged by the student.

Google Classroom

Every class has a Google Classroom that is automatically created. Students must be able to access digital platforms and resources such as Google Classroom daily. Students may be required to complete coursework in Google Classroom, and parents can receive progress reports from Google Classroom to monitor their children's academic progress. We encourage parents to register for these updates.

Course Sessions and Period Length

First Day of Classes – Thursday, September 5, 2024

Last Day of Classes – Thursday, June 26, 2025

Period Length – 45 minutes

Course Specific AP Calculus BC Exam Date

Thursday, May 21, 2026

Aviation High School Bell Schedule

	Monday - Thursday		Friday	
	Start	End	Start	End
Period 0:	7:15	8:00	7:19	7:59
Coat Collection:	8:00	8:08	7:59	8:07
Period 1:	8:11	8:56	8:10	8:50
Period 2:	8:59	9:44	8:53	9:33
Period 3:	9:47	10:39	9:36	10:19
Period 4:	10:42	11:27	10:22	11:02
Period 5:	11:30	12:15	11:05	11:45
Period 6:	12:18	1:03	11:48	12:28
Period 7:	1:06	1:51	12:31	1:11
Period 8:	1:54	2:39	1:14	1:54
Period 9:	2:42	3:27	1:57	2:37
Period 10:	3:30	4:15	2:40	3:20

Additional Information and Resources

College Board AP Calculus AB Course Description: <https://tinyurl.com/5fff5p79>

My AP/AP Classroom: <https://myap.collegeboard.org/login>