

# COURSE OVERVIEW

# Mathematics

Course Number: 445

Course Name: AP Calculus AB

Content ID Code: MA

## Course Description

AP Calculus is an advanced placement course with a syllabus that is congruous to the recommendations of *The College Board*. The class is offered at the level of expectation necessary for a student to receive at least "recommended" on the *College Board's Calculus AB* placement exam. Students should realize that this class is not being offered as a college preparatory course, but that students should expect the amount of out-of-class work and comprehension to be similar to nearly a full-year of college calculus. Student grades are mostly awarded on the basis of demonstrated mastery with respect to the *College Board's* goals and objectives for this course. Exams are timed and have calculator and non-calculator portions.

Credits:

Course Creation Date:

Local Course #:

## Instructional Time

Minutes:

Periods per Cycle

Cycles:

Clock Hours:

## Methods of Assessment

- |   |   |   |  |
|---|---|---|--|
| <input checked="" type="checkbox"/> 3-D Projects        | <input type="checkbox"/> Debates                | <input type="checkbox"/> Plays                    | <input type="checkbox"/> Simulations                   |
| <input type="checkbox"/> Anecdotal Records              | <input type="checkbox"/> Demonstrations         | <input type="checkbox"/> Portfolios               | <input type="checkbox"/> Speeches                      |
| <input type="checkbox"/> Benchmarks                     | <input type="checkbox"/> Diary/Journals         | <input checked="" type="checkbox"/> Presentations | <input type="checkbox"/> Standardized Tests            |
| <input type="checkbox"/> Chapter Tests                  | <input type="checkbox"/> Final Tests            | <input checked="" type="checkbox"/> Projects      | <input type="checkbox"/> Student Self Evaluation       |
| <input type="checkbox"/> Checklists                     | <input checked="" type="checkbox"/> Group Work  | <input type="checkbox"/> Publisher Tests          | <input checked="" type="checkbox"/> Teacher Made Tests |
| <input checked="" type="checkbox"/> Class Participation | <input type="checkbox"/> Interviews             | <input checked="" type="checkbox"/> Quizzes       | <input type="checkbox"/> Visuals                       |
| <input type="checkbox"/> Computer Products              | <input type="checkbox"/> Laboratory Experiences | <input type="checkbox"/> Research Projects        |  |
| <input type="checkbox"/> Conferences                    | <input type="checkbox"/> Observations           | <input type="checkbox"/> Role Play                |  |
| <input type="checkbox"/> Criterion-referenced Tests     | <input type="checkbox"/> Performance Tasks      | <input type="checkbox"/> Rubrics                  |  |

## Possible Adaptations

- |  |   |   |  |
|--|---|---|--|
| <input type="checkbox"/> Large Print Books               | <input type="checkbox"/> Hands on Activities    | <input type="checkbox"/> Peer Tutors        | <input type="checkbox"/> Independent Study |
| <input type="checkbox"/> Audio Taped Tests               | <input type="checkbox"/> Individual Aide        | <input type="checkbox"/> Word Banks         | <input type="checkbox"/> Contracts         |
| <input type="checkbox"/> Extended Time                   | <input type="checkbox"/> Manipulatives          | <input type="checkbox"/> Visual Cues        | <input type="checkbox"/> Mentorships       |
| <input checked="" type="checkbox"/> Preferential Seating | <input type="checkbox"/> Flash Cards            | <input type="checkbox"/> Key Words          | <input type="checkbox"/> Telescoping       |
| <input type="checkbox"/> Advanced Organizers             | <input type="checkbox"/> A Notetaker            | <input type="checkbox"/> Acceleration       |  |
| <input checked="" type="checkbox"/> Additional Practice  | <input type="checkbox"/> Wait Time              | <input type="checkbox"/> Tiered Assignments |  |
| <input type="checkbox"/> Alternate Assessments           | <input type="checkbox"/> Computation Aids       | <input type="checkbox"/> Expansions         |  |
| <input type="checkbox"/> Visualize the Auditory          | <input checked="" type="checkbox"/> Study Guide | <input type="checkbox"/> Learning Centers   |  |

# COURSE OBJECTIVES

## AP Calculus AB

Total Objectives: 11

Course Objective #	Course Objective	Month
Cognitive Level		
<b>The student will</b>		
445-01	The student will create functions in a numeric, symbolic, or graphic form to model numeric relationships. The student will establish restrictions on the domain of these functions through manipulative methods or by using technology. The student will identify values in the domain of the function that map to a set of corresponding values from the range.	
Analysis		September
445-02	The student will analyze and evaluate a limit given a table of values, a graph, or a symbolic function. The student will alter a piecewise function with an unknown constant to ensure continuity. Lastly, the student will validate if a function is continuous.	
Analysis		September
445-03	The student will find average and instantaneous rates of change given symbolic functions, tables of values, and also graphs. Given a function in a symbolic form, student will extend rates of changes noted at specific values to a general formula that describes rates of change for all domain values.	
Synthesis		October
445-04	The student will find the derivative of functions given in a symbolic form or graph the derivative of a function given in a graphed form. The student will develop the equations of tangent lines to curves for approximation purposes.	
Application		November
445-05	The student will be able to evaluate the derivative of symbolic functions involving logarithmic and exponential functions. The student will be able to develop the relationship between related rates of change.	
Analysis		November
445-06	The student will determine intervals of increasing/decreasing and concave up/down given a function rule or the graph of the function. The student will formulate characteristics of a function $f$ given the derivative of $f$ . The student will identify relative extrema of a function $f$ given $f$ , $f'$ , or the graph of $f$ and $f'$ . The student will collect evidence in making a sketch of a function $f$ .	
Analysis		December
445-07	The student will extend his/her experiences with critical numbers and relative extrema to find absolute extrema. The student will find the $c$ guaranteed by the Mean Value Theorem. The student will analyze the movement of a particle exhibiting rectilinear motion.	
Analysis		January
445-08	The student will use Riemann Sums to approximate certain applications involving the sum of products (as in multiplication). The student will know methods to improve Riemann Sum approximations and how to represent these methods symbolically.	
Analysis		January
445-09	The student will find the antiderivative $F(x)$ of a function $f(x)$ given that $F(x)$ is a function that the student knows how to take the derivative of based on previous objectives.	
Application		February

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## AP Calculus AB

Total Objectives: 11

Course Objective #	Course Objective	Month
	<b>The student will</b>	
445-10	The student will use the interconnection between areas trapped by curves and the integral to resolve a problem to an easier analysis. The student will estimate definite integral using the Trapezoidal Rule. The student will develop applications of the 2nd Fundamental Theorem of Calculus. The student will determine the average value of a function over an interval.	
Application		March
445-11	The student will find displacement and distance of a particle exhibiting rectilinear motion when given the velocity function. The student will set up an integral and compute the volume of solids with known cross-sections. The student will find the solution to a differential calculus by beginning techniques or by constructing a slope field. The student will make predictions about growth/decay situations.	
Application		April/May