AP Calculus AB
Synopsis 2024 - 2025

Description

Differential Calculus is the mathematical study of change. It uses the concept of "limits" to take a sequence of approximations called average rates of change, over smaller and smaller intervals, and analyzes if this sequence is approaching a specific definite value; if so, this value is defined to be the "instantaneous rates of change". This process is known as differentiation, and is critical in the study of Physics, Engineering, Economics, Finance, and many other fields.

Integral Calculus is the mathematical study of continuous accumulation. It uses the concept of "limits" to take a sequence of sums of increasing numbers of average values over smaller and smaller intervals, and analyzes if this sequence is approaching a specific definite value; if so, this value is defined to be the "definite integral". This process turns out to be the inverse of the operation of differentiation.

Course Information

Teacher: Dr. Paul Bailey

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Text: *Thomas' Calculus*, Weir, Hass, Giordano, 11$^{\text{th}}$ edition

Grading Scale

ALL students are expected to take the AP End of Course Examination. Students should not expect to pass this class unless they are able to pass the AP Exam. Letter grades are targeted to reflect the students projected AP Exam Score.

AP Score	Letter Grade
5	A
4	B
3	C
2	D
1	F

Grade Components

Classwork:	20%
Homework:	10%
Quizzes:	20%
Examinations:	50%

Classwork consists of attendance and participation in discussion, and activities such as team quizzes, worksheets, and other group work. Classwork activities are normally be graded on a scale of zero to ten.

Homework will be assigned routinely, to be completed at home. These will not be collected, but will be graded using short (ten minute) assessments wherein students demonstrate that they have done the reading and practiced the exercises.

Quizzes are about twenty minutes long and occur weekly on Friday, and may cover recent or accumulated material. These will be graded on a scale of zero to ten.

Examinations are hour long written assessments. As the year progresses, these will become increasingly similar to actual AP exams. They will be graded on a scale of zero to one hundred points. Examinations may be categorized as tests or projects.

Tests (30 %) will not allow calculators. *Projects* (20 %) will be calculator active. A graphing calculator is required for the course and for the AP examination. We strongly recommend the TI NSpire CAS.

Course Outline

This course outline is an approximation and is subject change as we proceed.

Semester	Week	Monday	Topic	Section
1	1	07/29/24	Sets and Numbers	Notes
1	2	08/05/24	Real Line and Cartesian Plane	1.1, 1.2
1	3	08/12/24	Real Valued Functions	1.3 - 1.5
1	4	08/19/24	Trigonometry and Calculators	1.6
1	5	08/26/24	Limits	2.1 - 2.3
1	6	09/02/24	Infinite and Sided Limits	2.4 - 2.5
1	7	09/09/24	Continuity and IVT	2.6 - 2.7
1	8	09/16/24	Derivatives	3.1 - 3.3
1	9	09/23/24	Trigonometric Derivatives	3.4
1	10	09/30/24	Chain Rule	3.5 - 3.6
1		10/07/24	Fall Break	
1	11	10/14/24	Related Rates	3.7
1	12	10/21/24	EVT and MVT	4.1 - 4.2
1	13	10/28/24	Monotonicity and Concavity	4.3 - 4.4
1	14	11/04/24	Optimization and L'Hopital's Rule	4.5 - 4.6
1	15	11/11/24	Antiderivatives	4.8
1	16	11/18/24	Sums and Sigma Notation	5.1 - 5.2
1		11/18/24	Thanksgiving Break	
1	17	12/02/24	Definite Integral	5.3
1	18	12/09/24	Fundamental Theorem of Calculus	5.4
1	19	12/16/24	Short Week	
		12/23/24	Winter Break	
		12/30/24	Winter Break	
2	1	01/06/25	Substitution	5.5
2	2	01/13/25	Area between Curves	5.6
2	3	01/20/25	Volumes	6.1 - 6.2
2	4	01/27/25	Arclength and Work	6.3, 6.6
2	5	02/03/25	Inverse Functions	7.1
2	6	02/10/25	Natural Logarithms	7.2
2	7	02/17/25	Exponential Functions	7.3 - 7.5
2	8	02/24/25	Inverse Trigonometric Functions	7.7
2	9	03/03/25	Hyperbolic Functions	7.8
2		03/10/25	Spring Break	
2	10	03/17/25	Integration by Parts	8.1 - 8.2
2	11	03/24/25	Partial Fractions	8.3
2	12	03/31/25	Slope Fields and Separable Diff Eqs	9.1
2	13	04/07/25	First Order Linear Diff Eqs	9.2
2	14	04/14/25	Review	
2	15	04/21/25	Review	
2	16	04/28/25	Review	
2	17	05/05/25	Review	
2	18	05/12/25	Review	
2	19	05/19/25	Short Week	