The mission of Hermon High School is to prepare students for personal success in college, career, and community.

AP Calculus AB

Instructor:
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This course is designed to give students more than one semester of college Calculus. An understanding of limits, trigonometry and functions is necessary. An in-depth study of limits, derivatives, integrals and the applications of each will be the focus of the course. Test preparation will be the central focus in the spring. Following the AP exam, students will be exposed to extended topics in precalculus that will be beneficial to further study in mathematics. Students are expected to take the AP Exam in the spring. Optional USM credit requires a $75 USM registration fee. The AP Exam has a required College Board exam fee of approximately $95. A graphing calculator is required for the completion of the course. 1 Credit HHS (optional USM 4 credit hrs)

Graduation Standards (the number of the standard is referenced in the performance indicators listed in each unit):

1: Reason and model quantitatively, using units and number systems to solve problems.
3: Interpret, analyze, construct, and solve linear, quadratic, and trigonometric functions.

Unit 1 Limits

Summary	Concepts of limits will be covered in detail as limits are what distinguish calculus from algebra. Students will understand the concept of a limit, be able to find limits through graphical, numerical, and algebraic techniques and explain why some limits do not exist. Limits will be used to determine continuity. Precalculus topics will be reviewed as needed.
Performance Indicators Assessed in Unit	1F. Compute within the real number system. 3C. Analyze functions using different representations. 3K. Understand limits and apply to determining continuity of a function

Unit 2 Derivatives & Applications

Summary	Concepts of derivatives will be covered in detail. The unit begins with using the definition of a derivative to find instantaneous rates of change. This is followed with a discussion of what it means for a function to be differentiable. Students then learn rules for differentiation and go one to find velocity and other rates of change. Derivatives of trigonometric, logarithmic, exponential and inverse trigonometric functions are learned and applied. Students learn to take derivatives of composite functions through the use of the chain rule and implicit functions through implicit differentiation. Once all derivative techniques have been learned, students begin using the derivative to determine extrema, concavity, and to graph functions. Students learn and apply the Mean Value Theorem. Modeling and optimization are emphasized as students solve min/max problems and related rate problems.
Performance Indicators Assessed in Unit	1F. Compute within the real number system. 3L. Find derivatives of functions and apply in problem solving.

Unit 3 Integrals & Applications

Summary	We begin our study of 'accumulation' through estimating with finite sums and define the

	definite integral as a lim of Riemann sums. We extend our knowledge of integration to antiderivatives and use the Fundamental Theorem of Calculus to connect derivatives with integrals. When given numerical data, we use trapezoidal approximations to find accurate estimates of integrals. We will explore methods of rebuilding from derivative to original functions by using slope fields and Euler's method. We perform algebraic integrations using substitution, partial fractions, and integration by parts. We look at specific applications of the derivative/integral relationship in exponential growth and decay, and logistic growth. Finally, we use integration to accumulate volumes of rotation and volumes of solids with known cross sections.
Performance Indicators Assessed in Unit	1F. Compute within the real number system. 3D. Build a function that models a relationship between two quantities. 3M. Find integrals of functions and apply in problem solving.
Unit 4	**AP Exam Preparation**
Summary	Students will remove all material, units 1-3 through AP style multiple choice and free response questions. Timed practice exams and scoring with AP rubrics will be a focus of this unit.
Performance Indicators Assessed in Unit	1F. Compute within the real number system. 3C. Analyze functions using different representations. 3D. Build a function that models a relationship between two quantities. 3K. Understand limits and apply to determining continuity of a function 3L. Find derivatives of functions and apply in problem solving. 3M. Find integrals of functions and apply in problem solving.
Unit 5	**Post-Exam Studies in Precalculus**
Summary	Topics in precalculus, central to Calculus II will be covered, as time allows. Potential topics: vectors, polar coordinates, series & sequences.
Performance Indicators Assessed in Unit	1F. Compute within the real number system.

Summative Assessments Retake

- Students have the opportunity to retake summative assessments.
- The student must submit a retake form to the teacher within five (5) school days of the date that the summative assessment score is reported to the student.
- The highest score a student can receive on a retake or late assessment is a 75.
- The score achieved on a retake will replace the current score (even if the score is lower).
- If a student is making up a test from an absence, that assessment will be graded up to 100.

Grading of Formative Assessments

- Formative assessments will count as 20% of the grade.
- Formative assessments may be scored on either a 0-100 scale or a 0-4 scale.
- The 0-4 scale will be represented in Power School as 4=100, 3=87, 2=77, and 1=67.

- The method of scoring of formative assessments will be determined by assignment.