

Falmouth High School

Curriculum Guide

Mathematics Department



Course Number 3702
Advanced Placement Calculus
Developed by FHS Math Teachers
2010-2011

Course Rationale

This course provides a fast paced, rigorous curriculum covering all topics needed for students who wish to take the AP Calculus Exam. Students who take this course are expected to take the AP test. Extensive use of graphing calculators is part of this course and part of the AP curriculum (TI-83+ recommended).

Course Description

3702 Advanced Placement Calculus (Year)
Grade 12 4 Credits

Prerequisite: B+ or better in Pre-Calculus Honors

Students will:

- Work with functions graphically, numerically, analytically, and verbally understanding the connections across the representations
- Understand the limiting behavior of functions and its effects on continuity and graphical behavior
- Use derivatives in reaching conclusions about graphical extrema and inflection with emphasis on solving optimization problems from business, industry, and engineering
- Understand the derivative as a rate of change, the concept of local linearity, and the use of derivatives in solving problems involving position, velocity, and related rates of change
- Understand the definite integral as a net accumulation of change through the study of Riemann sums and use the definite integral in solving problems including problems related to the area under the curve and volume of rotational solids
- Understand the relationship between the derivative and definite integral through the Fundamental Theorem of Calculus
- Communicate mathematics in well-written, concise language
- Model a written physical description or situation with a function, differential equation, or integral
- Use technology to help solve problems, experiment, interpret results, and verify conclusions.
- Determine the reasonableness of solutions
- Develop an appreciation of calculus and analytical mathematics as a coherent body of knowledge and as a human accomplishment

Student Audience

This course is for Grade 12 students who wish to take the AP Calculus Exam.

AP Calculus Core Text and Instructional Resources

Calculus of a Single Variable, McDougal Littell 1998 by Larson and Hosteller

Content Specific Essential Questions

Essential Questions

- How do the graphical, analytical, verbal, and mathematical relationships between elementary functions aid in developing a deeper understanding of real-world processes?
- What relationship does the limiting behavior of a function have to characteristics such as continuity, asymptotic behavior, and rates of change?
- How can the derivative be used to analyze the characteristics of functions?
- What is the relationship between the indefinite integral and a family of curves.
- How does the First Fundamental Theorem of Calculus use the limits of Reimann sums to describe net change?
- How does the study of differential and integral calculus relate to solving real-world problems?

Student Learning Goals

Grading Policy

Course	HW %	Tests %	Quizzes %	* Part %	Final Exams %
Algebra I Part I	20	35	30	15	12
Algebra I Part II	20	35	30	15	12
Algebra I CP	25	35	30	10	16
Geometry	20	35	30	15	12
Geometry CP	25	35	30	10	16
Algebra II	20	35	30	15	12
Algebra II CP	25	35	30	10	16
Sr. Adv Topics CP	25	35	30	10	16
Trigonometry CP	20	40	35	5	16
Pre Calculus CP	20	40	35	5	16
Algebra II H	20	45	35	---	16
Pre Calculus H	20	45	35	---	16
Calculus H	20	45	35	---	16
Calculus AP	20	45	35	---	16

Participation will be based on established criteria.

** Projects, journals, portfolios and notebook checks will be addressed in Classroom Management Plans and assigned as Test or Quiz grades.