

AP® Calculus AB, Form IV

Course Description

AP® Calculus AB covers the material included in the first semester of a college calculus course. The course is fast-paced and intensive and requires a solid commitment of time from each student. The first few weeks of the course solidify fundamental mathematical concepts that are required in calculus. The remainder of the course addresses the topics that are on the AP® Calculus AB Exam.

Technology is used regularly in this course in various forms. Students will learn how to use their graphing calculators for calculus-related functions and for the AP® exam. Students will use a variety of web-based applications and free software to explore calculus topics. Finally, students will complete several assignments and projects using Maple® mathematical software so that they begin to understand the power and capabilities of computer algebra software.

Students are expected to visit my website (<http://home.fuse.net/jmeb96>) regularly. The website contains the class calendar, all homework assignments, links to all of the free software and web applets used in class, and links to helpful websites and practice problems/tests.

Course Goals:

To cover course content in a way that meets the following goals (as defined by CollegeBoard®):

- Students should be able to work with functions represented in a variety of ways: graphical, numerical, analytical, or verbal. They should understand the connections among these representations
- Students should understand the meaning of derivative in terms of a rate of change and local linear approximation and should be able to use derivatives to solve a variety of problems
- Students should understand the meaning of the definite integral both as a limit of Riemann sums and as the net accumulation of change and should be able to use integrals to solve a variety of problems
- Students should understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus
- Students should be able to communicate mathematics both orally and in well-written sentences and should be able to explain solutions to problems
- Students should be able to model a written description of a physical situation with a function, differential equation, or an integral
- Students should be able to use technology to help solve problems, experiment, interpret results, and verify conclusions
- Students should be able to determine the reasonableness of solutions, including sign, size, relative accuracy, and units of measurement
- Students should develop an appreciation of calculus as a coherent body of knowledge and as a human accomplishment
- To prepare students for the AP® Calculus Exam

- To expose students to a variety of technology (graphing calculators, web applications, Maple, etc.) so that they learn how and when to use technology to solve both “contrived” and real-world problems, what to watch out for when using technology, and how to interpret the answer(s) that technology provides.