

# Advanced Placement Calculus

## Course Expectations and Policies

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#### Introduction and Content Overview

Calculus is the study of change in quantities. Developed over millennia and formalized by Isaac Newton and Gottfried Leibniz to support their studies of motion, calculus forms the framework for physics, chemistry, engineering, economics, and other quantitative fields. Calculus is the language of science, and itself represents an elegant body of mathematical ideas.

The outline for Advanced Placement Calculus is defined by the College Board. We will cover all topics in the AP Calculus AB curriculum: limits, derivatives, integrals, and differential equations. All students will take the AP Calculus AB Exam in the spring to demonstrate their knowledge of the topics in the AP curriculum. To enrich and expand our study, we will cover additional topics, such as advanced integration, Taylor polynomials, and approximation methods.

By electing AP Calculus, you are committing yourself to a college-level course that will require your full investment. The pace will be fast, and the workload intense. We will devote minimal time to review, and you will often be expected to master new concepts independently. AP Calculus will push you to develop your mathematical reasoning skills and problem solving abilities. It will be among the most demanding courses you have ever taken, but it will also be one of the most rewarding and useful.

#### What do I Expect of You?

I **expect** that every student taking AP Calculus:

- brings a strong interest in, and motivation to learn, mathematics
- seeks the rigorous preparation needed to enter a mathematically-oriented field (pure math, the physical sciences/engineering, economics, etc.) in the future
- carries a desire to learn the subject “beyond the textbook” and “beyond the AP test”
- possesses a strong background in precalculus, geometry, algebra, and the sciences
- is willing to acknowledge areas of weakness and take prompt action to address them
- has developed the time-management skills needed to handle a college-level workload
- will invest the time needed for success in the course
- will wrestle with challenging concepts and possesses the resiliency needed to pursue success, even when initially stymied by difficult material

## What Should You Expect of the Course?

- **AP Calculus is a demanding course.** You will need to devote a considerable amount of time to Calculus during the year, and you should expect to struggle upon your first exposure to some topics. Your attitude about the subject will go a long way in determining your success.
- **You will be graded on your ability to do Calculus.** Certain behaviors (homework completion, organization, note-taking, time management, bringing materials to class, etc.) will help you reach this goal. However, an “A” in AP Calculus is only earned through an outstanding mastery of the material, as demonstrated by your work on tests, quizzes, and projects.
- **Class time will be used to introduce new Calculus concepts.** We won’t spend time going over homework or reviewing ground that has already been covered. It is your responsibility to stay on top of the homework, check your solutions, and seek assistance when needed. Class time is valuable – please protect this asset by arriving on time and avoiding distracting behaviors.
- **You will need to think critically.** On homework assignments, quizzes, tests, and projects, you will be expected to reach beyond the basics covered in class and apply your knowledge. Complete each assignment with understanding as your goal, rather than simply “getting it done.” Your work is not truly “done” until you understand the material thoroughly.
- **AP Calculus is a team effort.** As a class, our ultimate goal should be that every student be well-prepared for the AP exam and for future work in calculus. Collaboration, participation, respect, and discussion aid the class’s learning, and are strongly encouraged.
- **You will be well-prepared for the AP Calculus AB Exam.** This spring, you will be expected to take the AP Calculus AB exam. We will cover all topics on the AP curriculum in preparation for this. If you take the course seriously, you will be well-prepared.
- **The primary focus of this course is not the AP Calculus Exam.** Despite the exam on the horizon, the first priority of the course is to teach the concepts and skills needed for college-level study in mathematics and the sciences. This will often mean going beyond the content of the exam.
- **The course does not end after the AP exam.** There is nearly a full month of classes after the AP exam. We will relax our pace, but will cover new material after the exam.

## Course Website

Updated information about the course is provided at my website, [www.stachemistry.com](http://www.stachemistry.com). If you cannot access it from home, you may use the classroom computer lab at any time.

## Course Materials

- **Textbooks:** *Calculus: Early Transcendental Functions* (3<sup>rd</sup> Edition) by Larson, Hostetler, and Edwards.
- **Binder:** You need a binder for class notes, handouts, and returned work.
- **Calculator:** A TI-83, TI-84, TI-89, or TI-nSpire calculator is needed to solve numerical problems. The TI-89 offers a slight advantage in the class and a considerable advantage in the “real world”.
- **Computer:** Because the course is held in the computer lab, you should make sure your student access privileges are up to date, because we may utilize these machines occasionally. You may also bring a laptop computer to class if you wish.

## Grading

This course is graded on a “total points” scale, which means that there are no separate categories for tests, quizzes, homework, etc. Instead, each assessment is worth a specific number of points, and your overall grade in the course is determined by the percentage of possible points that you earn. In general, your grade will consist of:

- **Tests** – These one-day (or longer) assessments will be held every two to three weeks. These tests will include problems that will require extension and application of the material covered in class. All tests are cumulative over any material covered throughout the entire year. Tests will be timed and calculators will not be permitted on some test questions.
- **Quizzes** – Quizzes will occur on a frequent basis, and will range from 2 minutes to a full period in length. They may be announced or unannounced.
- **Graded Assignments** – In addition to regular homework (see below), there will be graded assignments throughout the year. The emphasis in the grading of these assignments will be on your ability to explain your reasoning, and the processes used to solve problems.
- **Homework** – At the start of each unit, I will assign a set of textbook problems. Please carefully write up solutions to the chapter’s problems and keep all of each chapter’s problems in a single packet in your binder. Occasionally (usually the day of a quiz or test), the homework assignment will be checked and graded based on progress on the assigned problems. Solutions to homework problems are always available online and in the classroom. *I reserve the right to institute additional homework requirements (handing in work daily, etc.) to aid students who are performing poorly.*

Daily time invested in keeping on top of assignments is directly correlated with success on tests and quizzes and inversely correlated with the stress level of students. Never complain that you “had a lot of calculus to do over the weekend, so you didn’t finish,” because you will have had several weeks to complete the assignment. ***Don’t procrastinate – you CANNOT complete Calculus assignments on the night before the due date.***

The difficulty level of the material will often justify the scaling of grades on tests, quizzes, etc. A scale is never guaranteed; no scale will be applied if the general level of effort and mastery of the class does not meet my expectations.

## Absences

Attendance is essential to your success in AP Calculus. While legitimate conflicts may arise, please make an effort to prioritize academics during your senior year. In planning your extracurricular activities, understand that even school-related absences (sports, music, field trips, etc.) may impede your academic performance due to the volume of material covered each day. If you feel that a given school-related absence will compromise your performance in class, please communicate with me, and I will work with the teachers/coaches involved to resolve the conflict.

As a courtesy to your classmates and to me, please make a genuine effort to make up all work promptly. In cases of absence of a single day, make up work should be completed on the day of your return to school. Work that is missed due to scheduled absences (sports, music, field trips, etc.) must be made up *prior to* the absence. Make up for extended absences will be arranged on a case-by-case basis. Small quizzes and assignments will not need to be made up.

## Extra Help

I am generally available at school at 6:30 am, until at least 3:30 pm, and during periods A, B, E, and F of the school day. If you know in advance that you need extra help, check with me to ensure my availability. Check the second and fourth floors if you are looking for me.

In a cumulative course like Calculus, it is essential that you seek help immediately if you find yourself confused, particularly at the start of the year. Often, a small misconception, which is correctable with a few minutes of extra help, can hamper your understanding of future topics, developing into a major issue later in the year. Seek extra help early and often.

## E-mail / Electronic Communication

Electronic communication can be a valuable tool. Although I check my email frequently, it is not an effective medium for extensive extra help in math (eg. “How do you do #22?”). Instead, use it to schedule face-to-face extra help or to keep me informed (eg. “I’m sick, and will be missing school tomorrow; what should I do about the test?”). If you find yourself unable to complete an assignment on time due to extenuating circumstances, a quick email will go a *long* way towards gaining an extension.

Any electronic communication methods (forums, chats, listservs, etc.) set up for the course should be used strictly for conducting course business, and all postings must remain appropriate.

## Tutoring

The school’s motto calls all to be *Lux in Tenebris* by sharing talents with the STA community, to the benefit of others. All students taking AP Calculus possess considerable talent in mathematics, and it is expected that all will be willing to tutor and assist underclass students who require assistance in mathematics. Stay tuned for opportunities to do so!

## Acceptable Collaboration and Academic Honesty

I strongly encourage collaboration on AP Calculus assignments. Often, a group of students can bounce ideas off each other and help each other to master the material quickly. We will frequently work in groups in class. However, there are some limitations:

- Collaboration doesn’t mean “one person does all the work” – no real learning occurs this way. A true collaborative effort is one where everyone progresses in their understanding. Ask yourself: “Is everyone in the group learning a given skill well enough that they can later perform it on their own?”
- Collaboration doesn’t exempt you from writing up your own unique set of answers. It’s fine for a group to discuss and agree on an approach, but it’s not appropriate for the group to agree on a word-for-word solution.
- Collaboration or use of unauthorized aids on individual tests/quizzes is cheating. Cheating is a serious offense. All cheating incidents will result in a grade of zero and referral to the Dean of Students for further disciplinary action.

*If you are struggling, and feel that you need to cheat in order to succeed in the class, ask for help. Cheating will not help you learn the subject, and it will prevent me from recognizing your need for extra help. Don’t give in to the temptation!*