Academic Plan

AP Calculus AB – STEM High School – Fall 2018

Teacher: Mr. Sturtevant E-mail: MSturtevant@lwsd.org

Office Hours:

Mornings: Tues - Friday (6:45 - 7:15 AM)

Afternoons: Every day but Wednesday (2:30 - 3:30 PM)

Course Overview

The content of our AP Calculus AB course is grounded heavily in the course description provided at the APCentral website: https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-calculus-ab-and-bc-course-and-exam-description.pdf. While this document is targeted mainly at instructors, students would benefit from reading pages 1-5 and 7-20. After the start of second semester, pages 44-74 would also be of some instructional benefit.

The focus of the course is to provide students with a solid conceptual understanding of Calculus topics and provide them with a framework for further studies in mathematics. Students are also encouraged to take the AP Exam in May in hopes of earning college credit or accelerated placement when they enter College. Much of our work is done without calculator, requiring students to continue the development of their previously learned algebra skills.

Philosophy

In my experience teaching Mathematics at the high school level, I find that students are often lacking confidence in their basic skills and lack depth of understanding in the topics with which they are familiar. In addition, many students have become far too dependent on technology and formula sheets on test day.

To that end, my goal in teaching mathematics is to go beyond simple presentation of formulas and basic application to out of context problems. We will derive and learn to re-discover many of the formulas that we use by building on simpler rules and using algebraic manipulation. Examples are the derivation of the derivative of a^x and $\log_b x$ using what we know about logarithms and the derivatives of e^x and Ln x. Students are also taught to build the derivatives of their basic trig functions using the quotient rule as opposed to simply memorizing those formulas. Many of our anti-derivative formulas come from understanding our derivative formulas and reverse-engineering. You will also find in reading this syllabus that while I find technology an invaluable tool in many respects, it will not be allowed to replace brain power and be the sole means by which we solve problems.

We will also emphasize the importance of dealing with mathematics presented in several different forms: graphs, equations, tables of data, and verbally. In order to do this, we will supplement heavily from released AP exam questions from previous years made available by the College Board. We must first build a solid foundation of Calculus skills before this will be possible.

Prerequisites

Students entering AP Calculus AB should have finished 4 years of preparatory work in mathematics including Algebra I/II, Geometry I/II, Advanced Algebra, and Pre-Calculus and Trigonometry. The Advanced Algebra and Pre-Calculus courses provide students with a solid foundation in the analysis of the following classes of functions: Linear, quadratic, polynomial, rational, power, exponential, logarithmic, absolute value, piece-wise, step, and trigonometric. Focus surrounds the concepts of domain and range, function arithmetic and composition, as well as asymptotic behavior (vertical, horizontal, and oblique). Students are also introduced to some Calculus concepts (i.e. the difference quotient and basic properties of limits) as part of their Pre-Calculus Curriculum.

Use of Technology in AP Calculus

All AP Calculus students will need regular access to graphing calculators. In general, any graphing calculator with functionality equivalent to the TI-83 is sufficient. Please see the College Board website regarding calculators allowed on the AP exam for questions on specific models: https://apstudent.collegeboard.org/apcourse/ap-calculus-ab/calculator-policy. You may need to register yourself as a user. A few graphing calculators are available in the classroom, but are not available for overnight checkout.

The classroom used for the course has a document camera, Smart board, and TI SmartView software available as well as internet access. While students are encouraged to use technology and are taught the proper use of Calculus functionality on the calculators, students are counseled not to become dependent on technology. In preparation for the AP exam, students understand that the non-arithmetic functionality of the calculator is to be used only for finding intersection between graphs, zeros of a function and to evaluate derivatives at a point and definite integrals over an interval. Calculators are also often used to support conclusions (limits as an example) and do investigations. Answers in our class are most often represented as exact values, but rounded to 3 decimals of accuracy when calculators are used.

Assessment

Formal assessments in the form of Quiz or Chapter Exams attempt to create a balance between multiple choice and Free Response formats. In general, Free Response formats are weighed more heavily in assessment, requiring students to communicate understanding in written form. Multiple choice questions make up no more than approximately 25% of any given assessment. Likewise, calculators are allowed for approximately 30% of assessment tasks, in most cases providing an avenue for students to complete more work in a shorter timeframe. Again, the purpose of this policy is to emphasize the use of brain power and limit student dependence on technology.

Formal assessments may also be made in the form of PowerPoint Presentations and oral presentations to the class. In this format, students are provided the opportunity to show that they are able to communicate their understanding in both written and oral form.

Due to the difficulty and complexity of many of the topics in this course, I recognize that students often do not reach a level of mastery by the time typical “End of Chapter” assessments are given. Some students need more time to process and develop their understanding. To that end, assessments will look different in this class than any of your previous math classes:

To begin, Summative Assessments will be graded with regards to mastery of specific learning objectives. There will be no single test grade, but several grades, representing the level of mastery reached on each of the objectives evaluated via the assessment. Each of these learning objectives will have individual entries in the grade book and will be graded on a 10-point scale, each weighted based on complexity and breadth of the topic. These learning objectives will be listed explicitly on PowerSchool for each Unit.

Because some students may take more time to master particular learning objectives, they will be allowed an additional opportunity at a later date to show their mastery. As such, grades will be somewhat fluid and specific grades on learning objectives will rise and sometimes fall as students are given additional opportunities to show their level of mastery. More on this to follow below.

We will also have smaller quizzes along the way to check on progress toward learning goals and to test specific content knowledge around basic derivatives and integrals that will be graded simply on percentage correct.

Classwork Grades

It is especially important as we raise expectations in the classroom and take on more complex challenges in preparation for post-secondary education or training that students develop a sense of ownership in their education and future and develop more personal responsibility.

They will show this in many ways: Classroom attitude and decorum; Involvement in classroom discussions; working collaboratively with their peers; and sufficient practice/preparation outside of the classroom. Students will be responsible, with proper guidance, for determining the level of practice needed to master learning objectives.

Most days, students will be provided 10 to 12 suggested keystone exercises for practice each day. Students who are able to show mastery on those items are likely prepared on those topics and need not necessarily focus additional practice in those areas. They are encouraged of course to continue to seek new challenges or practice objectives that they are yet to show mastery of. Students who find they are unable to successfully master those keystone exercises are expected to show their level of commitment in other ways, whether seeking additional help during office hours or additional practice beyond the keystone exercises.

In our increasingly digital world, the answers and even detailed solutions to all of the problems in our textbook and many of my additional resources are easily available to students on the web with little effort. Students will not receive grades for their daily practice and practice will not be collected from students. With that said, I am happy to review individual student practice for anyone who would like feedback on their work.

We will have weekly quizzes to assess the quality of students' practice.

Classroom Expectations

Expectations for academic performance and code of conduct are very high in this classroom. We will have a good time and enjoy our time together, but students must learn to recognize when they need to be respectful participants in the classroom. Because I am providing students a great deal of flexibility and ownership of their time outside the classroom, my expectation is that the time spent in the classroom is focused on Calculus and Calculus only. Please be respectful of our time together. Gaming, surfing, and work for other classes is not acceptable.

Calculation of Grade: Points are cumulative throughout the semester. Quarter grades are not averaged to create a final semester grade. Grades will be calculated based on the weighted categories and grading scales below:

Category	Weight
Practice (Weekly Quizzes)	15 %
Summative Quizzes	15 %
Summative Assessments	70 %

Grading Scale			
A	90 – 100%	C+	77 – 79.9%
B+	87 – 89.9%	C	73 – 76.9%
B	83 – 86.9%	C-	70 – 72.9%
B-	80 – 82.9%	NC	Below 70%

- Individual opportunities for extra credit are not available. Do not ask. Any extra credit opportunities will be made available to the entire class.
- Students are encouraged to show all work on quizzes and tests. Partial credit may be rewarded at the teacher's discretion.
- Final Grades will not be rounded.

Dealing with Absences

Tests and Quizzes: If you are gone on the day of a quiz or test, you will be expected to make up that assessment on the day of your return. That will be done during class time unless you are able to arrange transportation to make up the assessment during office hours so that you do not miss any new material in class that day. If the absence was multiple days, you are expected to meet with the instructor upon your return to discuss makeup of what you missed. Exams missed due to an unexcused absence will receive a score of 4 of 10 on all objectives for the exam and cannot be made up.

Retesting on Objectives

Approximately twice a month, students will be given an opportunity to show mastery of objectives they previously had not mastered. These opportunities will happen outside of class time during office hours and will be scheduled 2 weeks in advance.

Process:

- Students wishing to retest will fill out an online form via PowerSchool in advance, listing the objectives they are ready to retest on. The deadline for submissions is usually a week in advance (This is a hard deadline since I have 120+ Calculus students)
- A test specific to the student will be created.
- Student attends on the scheduled date and takes the test.
- The test will be graded and new mastery scores will be awarded, not considering the original test.
- The new grades are entered into the gradebook. Grades may go up, down, or stay the same.

Important Notes:

- Students may retest against any objective only one time. Do not request an objective until you are sure you can increase your score.
- Once you have written the retest, you may ask Mr. S. not to score any particular objective if you feel you have done poorly, however, you will not get another opportunity against that objective.

What about finals?

Because you are being given additional time to master the material, my expectation is that you still have that material mastered at the end of the semester and course. After all, that is the ultimate goal of this course: for you to leave the course having mastered the content.

First semester:

This exam will work much like a retest against objectives. Mr. S. will choose 10 to 15 objectives from 1st semester to retest all students on. This exam will be multiple choice and made up of AP-style questions that test the objectives selected. You will not be told the objectives selected ahead of time. Mastery scores will be awarded based on performance and entered into the grade book. As with the retest system, these grades will cause some objectives to go up, some down, and some will not change.

End of year:

This test will be a full AP exam in the format taken in May and will be completed over 4 days. It will be scored with an official AP rubric. For this reason, the grading categories in 2nd semester will have different weightings than 1st semester and you will receive that breakdown at the beginning of second semester.

Communication (PowerSchool/Email/Conference)

I maintain a PowerSchool site for this course. Students and parents alike are encouraged to make visiting that website a regular part of monitoring progress in this course. Grades are maintained in the Skyward program and are maintained weekly. I encourage you to monitor grades regularly and contact me immediately with any issues or concerns regarding grades. Grades are often updated on weekends so checking grades early on Mondays will provide the most accurate look at your grade.

Students are encouraged to claim ownership of their performance in this class through diligent monitoring of grades and regular communication with the instructor regarding any concerns. Parents are also encouraged to contact me via email whenever concerns arise. I am also available to meet with students and/or parents should you desire a face-to-face conference to discuss any facet of this course or the student's performance.

The preferred method of communication with me is via email and I do my best to always respond within 24 hours. I seldom check voicemail so that is not a reliable way to make contact with me if you have concerns you wish to discuss.

Other Use of Technology in my classroom:

Technology such as personal laptops, tablets, cell phones, MP3 players can be valuable tools in organizing our lives and filling our entertainment needs. However, they can also be a distraction to the learning environment if used at inappropriate times. The single largest hurdle over the last few years for many students has been the lack of personal discipline and understanding appropriate times, so I will spell out my expectations very clearly:

Cell Phones: seldom acceptable out in the classroom unless the teacher includes their use in the lesson. Keep them silenced and put away.

MP3 players/headphones: acceptable during work time only after all group work and instruction is complete.

Personal and School-issued laptops: acceptable at all times for use in the classroom to access lesson resources and note-taking, however I will monitor use.

Test Day policy: No personal electronics of any sort with exception of calculators when needed for the exam. This includes during and after the exam.

I have no desire to play policeman in this class. Students are expected to make adult decisions about their own learning and take ownership of their personal success in this class. I encourage students not to let technology distract them from the focus of this class, Calculus. If I find personal use of technology to be distracting to others, I will intervene.

Some survival tips to help you:

Form a study group	Get to know your book	Get to know your calculator
Take detailed notes	Ask intelligent questions	Put your time in (no short cuts)
Recognize your resources	Look at the big picture	Remember to ask WHY!

Get involved with your learning (don't be a spectator)
Try several methods (table, equation, graph)

Office Hours

I provide a great deal of time before and after school to help struggling students. This is a difficult course and I highly encourage you to take advantage of the hours I make available to assist students both in class and outside of class time. Tutoring is expensive. Make sure that you are doing everything possible to guarantee your success. Note-taking and daily practice are essential. I'm likely to ask to see what you've done so far when you come in for help so I can quickly assess where you are and so we can optimize our time together.

Test Days

- All backpacks should be left out in the hallway next to the door.
- Cellphones should be turned off and placed in backpacks.
- On your desk, you may have writing implements, erasers, water bottle, and calculators when allowed.
- No pencil pouches.
- There are no bathroom breaks once the test is handed out. Take care of this before class.
- Once your test is turned in, you may not access it again.
- Tests are turned in at the table at the front of the class. Once you stand up with your test in hand, you must turn in the test. No returning to your desk to make a last-minute change.
- Cell phones and other electronic devices (other than calculators) are not allowed in the classroom. If seen, it could result in a 0 on the exam.
- Mark all answers clearly by circling or boxing the answer. When multiple answers are given, label them appropriately.
- Answers with no work are seldom appropriate. Supporting work is expected for all answers. An answer with no work may not receive credit. If unsure about a problem, ask.
- Justifications or explanations should be written in complete sentences.

Please sign and return this portion by Friday, September 7

I have read and discussed the grading policy and academic plan for Mr. Sturtevant's 2018-19 AP Calculus AB Class.

_____ Student Name (Printed)

_____Date _____ Student Signature

_____Date _____ Parent/Guardian Signature

Preferred Contact Information

_____ Home Phone #

_____ Work Phone #

_____ Email Address

_____ Any Additional Contact Information