AP Calculus BC

Bellaire High School

2008 - 2009 Course Guide

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Please read this document carefully. You are responsible for the information contained in it.

Welcome to AP Calculus BC at Bellaire High School!

This challenging course will provide you with the opportunity to greatly expand your mathematical knowledge and prepare you for further studies in mathematics, sciences, engineering, etc. AP Calculus BC covers the first two (typically out of three) semesters of college-level Calculus. Most US colleges and universities grant advanced placement and/or credit for one or two semesters of Calculus for qualifying AP Calculus BC exam scores. To find out a specific institution's policy, consult its catalog or web site. This rigorous course consists of four main components:

- Functions, Graphs, and Limits
- Derivatives
- Integrals
- Polynomial Approximations and Series

The complete AP Calculus BC Course Guide can be found at
http://apcentral.collegeboard.com/apc/public/repository/ap08_calculus_coursedesc.pdf.

Who should take this course?

Students who have earned at least a 90 average in Pre-AP Pre-Calculus (preferably at Bellaire High School and not through a summer course), enjoy learning about challenging math concepts, are highly motivated, and have time to commit to learning outside of class should take AP Calculus BC. Students must be able to apply knowledge and concepts to solve new and unique problems (including during exams). Students must have the self-motivation and discipline needed to complete homework on a regular basis even when it is not graded. It is crucial for students to have mastered all concepts and skills from Algebra 1, Geometry, Algebra 2, and Pre-Calculus. In particular, students must be familiar with the properties of functions, the algebra of functions, and the graphs of functions including linear, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, and piecewise defined. *All students in this class are expected to take the AP Calculus BC exam in May!*

What is the policy for dropping this course?

If you or Mr. Mazzoni decide that moving from "BC" to "AB" would be advantageous, this change can be made either at the end of the first 6-weeks (October 3, 2008) or the end of the fall semester (after taking the final exam). One factor that may lead to a recommendation that you move from "BC" to "AB" is if any of the following are below an 80: first test, second test, first six-weeks grade, or fall final exam. Unless special permission is obtained from your assistant principal and counselor, students must remain in AP Calculus BC until the end of the first six-weeks (October 3, 2008) or the end of the fall semester (including the final exam). If you move to AP Calculus AB at the end of the first six-weeks, your report card and transcript will have the grade you have earned in BC for the 1st 6-weeks, but the course will be listed as AB for the entire year. In other words, your first six-weeks grade earned in "BC" will not be increased if you move to "AB." If the recommendation is made for you to move from "BC" to "AB," please consider this very carefully. Every year there are some students who struggle in AP Calculus BC, but they decide to remain in the class despite the recommendation to move to AP Calculus AB. In most of these cases, these students continue to earn lower grades and even more costly they earn a 1 or 2 on the AP exam. See http://www.bellaire.org/mazzoni/apcalc/bc_results.pdf for score distribution details. One should not view moving from "BC" to "AB" as a failure. Both courses include challenging and rigorous college-level material. More information about the differences between "AB" and "BC" can be found at http://www.bellaire.org/mazzoni/apcalc/notes/00_ab_bc_info.pdf.

What is the approximate work-load for this course?

Students should anticipate about 30 homework problems (about 60 minutes) per class meeting when new material is presented. Only two major tests will be given each six-week grading period. Therefore, retention of knowledge is critical. In fact, most concepts and skills we learn will resurface throughout the entire course and everything will be covered on the AP exam in May.

With whom will you be working in this course?

You will be working with Mr. Mazzoni whose primary goal is to *guide* you as you learn. Mr. Mazzoni earned a bachelor of science degree in Mathematics with a minor in education and has taught AP Calculus BC since 1998. You will also be working with your classmates, each of whom will be making a unique contribution to this class. In turn, you will contribute to the class by sharing your ideas, mistakes, discoveries, inventions, and solutions.

The "classroom"

Your classroom at Bellaire High School is the place where ideas are brought together and formalized. *Our classroom is a place for learning*. However, a significant amount of learning must take place outside of the classroom during individual and group studies. *Successful calculus students spend a significant amount of time outside of class internalizing important concepts by reading the textbook, reviewing class notes, attempting homework, making mistakes on the homework, and getting help during lunch tutorials on mistakes that cannot be resolved at home.*

Online forum

The online forum is intended to provide you with a central place for asking and answering questions about what we are learning in our class. By using this forum, you agree to adhere to the rules outlined in the student code of conduct. Any violations of the student code of conduct will result in the appropriate discipline action and your removal for the forum. Although posting to the forum will not initially be required or graded, I will make note of students who provide genuine and content-rich posts on a regular basis. The internet provides many social opportunities; our calculus forum is for calculus topics relating to our studies only.

Homework

Homework will be assigned daily and should be completed on-time (usually the next day) to keep up with new material. In order to succeed in this course, you must complete all homework. However, homework will *not* be graded on a regular basis since it is part of the learning process and mistakes and follow-up questions are expected. At this level of study, you are afforded more flexibility and freedom. Ideally, you would solve every assigned problem each night; however I know that this is not always possible. With this freedom comes the responsibility to keep up with your work. You should consult your notes, book, and classmates as you learn, but there is no benefit from copying the work of others. As you complete your homework, remember to pay close attention to details, justify your steps, and show all of your work. (You must do all of these on class tests and the free response section of the AP exam.) If you are under a time constraint, you will be better off skipping a few similar homework problems instead of rushing through all of them and then revisit those you skipped at a later date. *Some words of caution: if, in previous math courses, you found it unnecessary to do all of your homework or you rarely asked questions or attended tutorials, it is extremely unlikely that this will be the case for AP Calculus BC.*

Quizzes

Quizzes may be given occasionally and are designed to check your understanding of recent homework assignments. Quizzes are typically worth about 10-30 points, last 10-20 minutes, and are usually not as difficult as a major test since they may be given before concept mastery is expected. Quizzes may or *may not* be announced.

Understanding checks

Time permitting, a very short "quiz" may be given at the beginning or end of a class period to check for understanding of a recent topic. This will typically be unannounced, very short, and may or may not be graded. The key to doing well on this type of assessment is to pay close attention during class, take detailed notes, work on homework regularly, attend lunch tutorials when needed, and ask questions anytime something does not make sense.

Major tests

There are two 100 point tests scheduled for each grading period. Tests will be held on Thursdays preceded by a review day on Wednesdays in most cases. A detailed list of topics to be covered on each test will be provided. To be fully prepared for a test, make sure you understand all class notes, activities, and discussions and complete all homework assignments. Do not limit your study time to the night before the test! Review notes, homework, and previous tests regularly. Practice additional textbook problems not assigned for homework. A few minutes before a test is ***not*** the time to ask questions or to "cram!" I will *not* be able to answer questions the day of a test after 7:30 a.m., between classes, or during lunch. Tests will start promptly when the bell rings and must be turned in when the class ends. *No extra time will be given on tests.* It is possible that some tests may be curved and the curve is based on the assumption that every student has had the same amount of time to complete the test. There will be no opportunities to retake tests or final exams if you are not satisfied with your score.* Students who prepare themselves well for tests should expect them to be quite challenging and to include "AP style" questions. Although a raw test score may be lower than expected, often a curve will be applied to adjust for the difficultly level of the test. This testing philosophy is similar to the actual AP Calculus BC exam where earning less than 70% of the points results in a score of 5 (test curves in-class will not be quite this generous!).

Tests will typically include questions that review previous test topics. Test formats will vary, but can include free response questions of differing lengths and multiple choice questions. *Although some questions will be similar in nature to questions from the text book, other questions may require you to apply the knowledge that you have obtained to solve original and challenging problems.* You will have to think, reason, and make decisions while applying what you have learned! In order to receive full-credit on (non-multiple-choice) test problems, you must *show all of your work*. A correct answer alone will typically not be awarded points. Partial credit may be given on free response questions, but not on multiple choice questions. Tests will generally be returned by the following Monday.

* Except in cases where students have a modification that calls for extra time during in-class tests. If this is the case, please inform Mr. Mazzoni *before* the first test so that accommodations can be arranged.

Absenses and make-up tests

A few notes about attendance on test days: If you know ahead of time that you will miss a major test, please let me know as soon as possible. If your absence is unexpected, please email me that day (if possible). The primary make-up day for tests will be the following Tuesday during lunch. It is your responsibility to confirm the time of the make-up test and to attend the make-up test. It is also your responsibility to attend tutorials to make-up any missed material or review days. Situations involving extended absences will be dealt with on an individual basis.

It always becomes very suspicious after a student accumulates multiple test-day absences. If you have a truly legitimate reason for being absent, I will be happy to work with you to arrange a make-up test. If not, please be aware that the make-up tests are completely different from the test that the rest of the class takes and they may be of a different format. Therefore, specific preparation suggestions I make to the class about particular skills and concepts to emphasize or deemphasize may not apply to a make-up test.

Dishonorable actions will not be tolerated under any circumstances in or out of our classroom.

Presenting solutions

This will become an important component of this course. This is not intended to be a high-pressure exercise; rather it will provide you with the opportunity to occasionally present your work and for us to discuss techniques, procedures, notation, mistakes, etc. You will be assigned to a group of about four students who will be responsible for presenting a solution to a homework problem to the class about once or twice each week. Group members who contribute to finding and presenting the solution receive an automatic 5 points (out of 5 points) each time a solution is presented. Legitimate mistakes will not reduce your score, however a lack of effort or participation will.

Extra credit

There may be a few opportunities to earn extra credit points throughout the year. Extra credit is only available to those students who are in-class (or have an excused absence) on the day it is given. Additionally, you can earn 2 points for returning signed progress reports (up to 4 points per grading period). *In fairness to all, no extra credit will be offered on an individual basis. This includes extra points to raise a semester average that is close to the next letter grade – please, don't ask! An 89.49 rounds to an 89.* ***No extra credit will be awarded to students who accumulate any unexcused absences during a six-week grading period.***

Late work policy

All homework and make-up work should be completed on time. Extra credit will ***not*** be accepted late. On the rare occasions when homework is collected, the maximum percentage of points that can be earned depends on when the work is completed (an example of a 20 point assignment in which 18 of the original points were earned is shown):

on-time	up to 100% of points	18 (max 20) points = 90%
1 day late	up to 85% of points	15 (max 17) points = 75%
2 days late	up to 70% of points	13 (max 14) points = 65%
≥ 3 days late	up to 50% of points	9 (max 10) points = 45%

Grade calculations

Each six-week grade will be calculated by dividing the points you have earned (including extra credit) by the total possible points you could have earned (excluding extra credit) during that grading period. Your semester grade will be the average of three six-week grades and a final exam. ***If you maintain an average below 80, it will be suggested that you transfer to AP Calculus AB if immediate improvement is not shown. Averages below 75 will result in a strong recommendation to transfer.***

Final exams

The Fall final exam is cumulative for the first semester and the Spring final exam is cumulative for the entire year. Review material will be provided for the Fall semester final exam. To prepare for the Spring final exam, use the same material and procedures recommended for preparing for the actual AP exam since the format will be similar and, of course, the topics will the same. It is my hope that all students will be exempt from the Spring final exam. However, only Seniors meeting all of the requirements (85 or above average, 3 or fewer excused absences, no unexcused absences, and at least satisfactory conduct) will be exempt. Non-seniors will also be exempt from the Spring final if they earn a 90 or above average, 3 or few excused absences, no unexcused absences, at least satisfactory conduct, and take the AP Calculus BC exam in May. All non-exempt students must take a cumulative final exam during the scheduled final exam time in May.

Progress reports

Detailed progress reports will be made available online at the midpoint and end of each six-week grading period. Progress reports must be signed by a parent and returned promptly. Two extra credit points will be given to those students who return signed progress reports on-time.

Website

In addition to progress reports, you can find course-related information on my website. Most class notes and handouts will be posted online. If you notice that a recent handout is missing, please email me so that I can upload it. You will also find a section of related links to good calculus sites. If you come across a site that you like, please forward it to me so that I can add it to the list.

Where can I get help when I do not understand something?

Please do ***not*** hesitate to ask questions … there are ***no*** dumb questions in this class! Due to the amount of material we will be covering, there may not always be enough time during a typical class period to answer all of your questions or you may not realize you have a question until days after we cover a particular topic. I will generally be available Tuesdays and Wednesdays 11:45 a.m. - 12:15 p.m. in room 214 and as needed to answer questions. You are also encouraged to use our online calculus forum or email me your questions. Since you will be working with other students in your class on a regular basis, help each other! Communicate online, call someone, or meet for study sessions. Also, consult family members with math backgrounds and other outside reference materials including the internet. *The pace of this course will be* ***extremely rapid*** *at times. This is to ensure that all of the required material is covered.* ***Remember:*** Help does not mean copying work or having someone else do the work for you!

Materials

Bring the following with you to ***every*** class meeting (unless told otherwise):

- Loose leaf paper (or a spiral notebook) and a pencil or pen
- Graphing calculator
- A three-ring binder might be helpful to keep notes, tests, handouts, etc. (1 - 1.5" binders seem to work well)
- All assignments completed

A textbook has been issued to you for this course. You are responsible for maintaining it and returning it in good condition at the end of the year (or if you drop the course). Please note that the textbook for this course was new for 2007-08 and has a high replacement cost.

Calculator use in this class and on the AP exam

I recommend that you use a TI-83 or TI-84 Plus or Plus SE graphing calculator. If enough students have their own calculators, I have TI-83 Plusses that students can check out for the year. *Please bring your graphing calculator to class every day*. Although you will not need your calculator every day, there are many times in which we will spontaneously use the calculator. In fairness to all, TI-89s or any calculator with a computer algebraic system (CAS) will not be allowed for class tests. The AP exam is written so that using a TI-89 does not provide an advantage and therefore it may be used for that exam.

Classroom procedures

Attendance. It is very important that you are present every day. However, if extenuating circumstances arise and you must be absent, I will allow you to make-up any missed work if the absence is excused. *It is your responsibility to obtain material and notes from me or your classmates and to arrange any needed make-up times*. Typically, you will be allowed two nights to make-up work. Consult the *Student Handbook* for consequences of unexcused absences. Skipping will *not* be tolerated and will result in an unexcused absence and a call to your home. If you are aware of an upcoming absence ahead of time, please let me know.

Tardy. Students are expected to be seated and have materials ready when the tardy (second) bell rings. This includes your book, notebook, calculator, and sharpened pencil on your desk. If you will be arriving late, you must obtain a tardy permit. Please enter the room quietly and "tune-in" to the lesson quickly.

Written Excuses / Permits. I will designate an area in your classroom for you to leave permits. *Notes to excuse absences must be given to the attendance office the day you return*. If you must leave campus early or arrive late during my class, you must provide a note signed by a parent and the attendance office. Additionally, you must sign out/in at the attendance office when you leave/arrive. Please do not disrupt the class with notes or permits.

Conduct grades

I expect no conduct problems. Everyone in this class has the right to learn, free from any fears of being intimidated or embarrassed. Any conduct issues that do arise will be dealt with immediately. I have the responsibility to help you and your classmates learn without disruption or interference. Thus, you are expected to adhere to the following rules of conduct:

- Respect everyone and everything - no exceptions
- Participate, concentrate, listen, and follow directions from "bell to bell"
- Do not disrupt the learning process for yourself or others (i.e., talking out-of-turn, sleeping, eating, doing homework for another class, or using any type of electronic device (phone, iPOD, camera, PDA, calculator, game system, etc.))
- Follow the rules and policies of Bellaire High School as listed in the *Student Handbook*

E = 0-1 infractions, S = 2-3 infractions, P = 4 infractions, U = 5 or more infractions. Arrive to class on-time, ready to work when the bell rings. I reserve the right to assign conduct grades according to overall conduct and attitude demonstrated during each grading period.

Tentative test schedule

Although major changes to this test schedule are unlikely, you will be informed of any changes during class.

1st 6-week grading period (August 25 – October 3)

09/11/08	Test #1:	1.1 – 1.6	Limits; Continuity

2nd 6-weeks grading period (October 6 – November 7)

10/16/08	Test #2:	2.1 – 2.9	Differentiation
10/30/08	Test #3:	3.1 – 3.5, 3.7, 3.8	Applications of Differentiation

3rd 6-weeks grading period (November 10 – December 19)

11/20/08	Test #4:	4.1 – 4.8	Area and Integrals; Fundamental Theorem; Integration Techniques
12/11/08	Test #5:	5.1 – 5.4, 5.6	Area between Curves; Solids of Revolution; Work

4th 6-weeks grading period (January 6 – February 20)

01/22/09	Test #7:	6.1 – 6.4, 6.6	Integration Techniques
02/12/09	Test #8:	7.1 – 7.3	Differential Equations

5th 6-weeks grading period (February 23 – April 9)

03/05/09	Test #9:	8.1 – 8.6	Series and Tests for Convergence
03/26/09	Test #10:	8.7 – 8.8	Taylor Series

6th 6-weeks grading period (April 13 – May 28)

04/16/09	Test #11:	9.1 – 9.5, 11.1 – 11.3	Parametric; Polar; Vector-Valued Functions
05/06/09	AP Calculus BC exam		*Everything!*

The AP Calculus BC Exam

Test date: Wednesday, May 6, 2009 at 8:00 AM

Test duration: *3 hours and 15 minutes*

Section I *1 hour and 45 minutes*

- Part A: 28 multiple-choice questions *without* a calculator (55 minutes)
- Part B: 17 multiple-choice questions *with* a graphing calculator (50 minutes)

Section II *1 hour and 30 minutes*

- Part A: 3 free response questions *with* a graphing calculator (45 minutes)
- Part B: 3 free response questions *without* a calculator (45 minutes)

Further details about the exam will be provided during class throughout the year.

What happens after the AP exam?

Since the AP Calculus exam is quite early in May, there are numerous class days remaining after the exam. Many of you will miss some class days while taking other AP and IB exams. Bring materials to our class so that you can study for these other exams. The free response questions are released a few days after the administration of the exam and we will go through those six questions together during class. This allows me the opportunity to obtain feedback from you about specific questions and problem areas and allows you to form a preliminary assessment of your exam performance.

Please note that changes to the information contained in this document may occur at any time. You will be informed of any changes during class.
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