

# Advanced Placement Calculus BC (MTH 540)

Ms. Weires

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## COURSE DESCRIPTION

AP Calculus BC is the most advanced course in the mathematics curriculum offered in high school. It is a full-year course in the calculus of functions of a single variable and is comparable to calculus courses in colleges and universities. Topics include all Calculus AB topics plus additional topics such as series and parametric, polar and vector calculus. This course will prepare students to take the Advanced Placement Exam in May. Students may earn college credit depending on the results of the examination. The content is designed to qualify the student for placement and credit in a course that is one course beyond that granted for Calculus AB. A graphing calculator is necessary.

## STANDARDS

As recommended by the College Board, this course will take a multi-representational approach to calculus. Concepts will be represented graphically, numerically, analytically and verbally. Students will solve problems both with and without the use of technology.

## ASSESSMENTS

Students will complete both formative and summative assessments throughout the year. These may include quizzes, tests, homework assignments, in-class activities, or other means of measuring progress.

## CONTENT

<u>Topics to be covered</u>	<u>Entry Level Skills</u> (a.k.a. "You should already know this.")
Functions, Graphs, and Limits (Some of this is included as part of your independent review for the beginning of the year.) <ul style="list-style-type: none"><li>• Analysis of graphs</li><li>• Limits of functions (include one-side limits)</li><li>• Asymptotic and unbounded behavior</li><li>• Continuity as a property of functions</li><li>• Parametric, polar and vector functions</li></ul> Derivatives <ul style="list-style-type: none"><li>• Concepts of the derivative</li><li>• Derivative at a point</li><li>• Derivative as a function</li><li>• Second derivatives</li><li>• Applications of derivatives</li><li>• Computation of derivatives</li></ul> Integrals <ul style="list-style-type: none"><li>• Interpretations and properties of definite integrals</li><li>• Applications of integrals</li><li>• Fundamental Theorem of Calculus</li><li>• Techniques of antidifferentiation</li><li>• Applications of antidifferentiation</li><li>• Numerical approximations to definite integrals</li></ul> Polynomial Approximations and Series <ul style="list-style-type: none"><li>• Concept of series</li><li>• Series of constants</li><li>• Taylor series</li></ul>	Background in functions <ul style="list-style-type: none"><li>• Linear</li><li>• Polynomial</li><li>• Rational</li><li>• Exponential</li><li>• Logarithmic</li><li>• Trigonometric</li><li>• Inverse trigonometric</li><li>• Piecewise defined</li></ul> Values of trig functions <ul style="list-style-type: none"><li>• <math>0, \pi/6, \pi/4, \pi/3, \pi/2</math></li></ul> Basic knowledge of trig identities Basic algebraic manipulation-rational expressions and exponents Expertise on TI-83+, TI 84+ or TI NSpire Limits <ul style="list-style-type: none"><li>• Evaluating limits</li><li>• End behavior models</li><li>• Continuity</li></ul>

## INSTRUCTIONAL STRATEGIES

A variety of strategies will be used, including (but not limited to) group work, individual work, teacher-led activities, and problem-based activities.

## CORE MATERIALS/RESOURCES

**Textbook** – Calculus: Graphical, Numerical, Algebraic, 5<sup>th</sup> edition, by Finney, Demana, Waits, Kennedy and Bressour, copyright 2016

**Calculator** – You will need to own or have access to a graphing calculator. I recommend a TI-84+ or a TI NSpire CX CAS. Let me know if you have a different calculator. A graphing calculator is **REQUIRED** for the AP Calculus Exam that you will be taking in the spring. Calculators with a QWERTY keyboard are not allowed.

**Notebook** (with clean paper – OK, not a big issue right now, but in about 3 months some of you will be trying to cram notes onto the back cover or in unused margins, etc.) - Keep your notes neat and organized. They should be kept separate from your homework.

**Pencil** (with an eraser – because we all make mistakes).

## ACADEMIC/BEHAVIORAL EXPECTATIONS

I expect you to behave as mature, responsible, respectful students. Remember to show your Mustang PRIDE! I will follow the conduct policies outlined in your student planner. This includes responsible use of electronic devices. Should a problem arise I may contact your parents and/or pursue assistance from the office. Any form of cheating (this includes plagiarism) will not be tolerated. Consequences may include, but are not limited to, a score of zero on the work, contacting your parents and/or Assistant Principal, or an F in the course.

### **Absences**

- If you miss class FOR ANY REASON it is your responsibility to get the assignment and class notes. Assignment sheets will be given to you at the beginning of each chapter and are posted on my website. Extra copies of all handouts will be available on the bookshelf in the room. Be sure to pick up any that you may have missed when you were absent.
- If you miss class on a test/quiz day, you will be expected to take the test/quiz on the day you return to school. If you miss the day before a previously announced test/quiz, you will be expected to take the test/quiz with the rest of your class. If you miss more than one day I will work with you to make other arrangements.
- Try not to miss this class. Most people find it difficult to make up calculus. If you know you will be gone, be sure to get the assignment before you leave.
- Problems with absences (excused or unexcused) or tardies will be handled according to the Hempstead attendance policy.

### **AP Exam**

The AP Calculus exam will be administered the morning of Tuesday, May 15, 2018. Scoring well on the AP exam may earn you up to 2 semesters of college credit and placement into the third semester of calculus at the college level. It is my expectation that everyone enrolled in this course will take the AP test. Information regarding exam registration will be given to you second semester.

## **Finding Calculus Help**

If you are having trouble with calculus you need to get help IMMEDIATELY. Working together is strongly encouraged. You will find that you can learn a lot from each other. (Remember - working together and copying are different!) I will be available after school most days, and before school on days when I have no meetings scheduled. Let me know when you want to meet so I can be sure I'm in my room when you need me to be. You may also come in without an appointment, but it may take a few minutes to find me.

Online resources are provided with your textbook. In addition, there are several websites with helpful calculus tutorials. Links can be found on our Canvas homepage.

## **GRADING**

Your grade will be based on the following:

**Tests** – Tests will always be announced in advance. Chapter tests may be retaken. Your final test score will be calculated by taking 2/3 of your retake score and adding 1/3 of your original score. We will be covering nine chapters in the book plus a few supplemental topics. This means that there will not be many chapter tests in a semester. Take the tests seriously and do a good job the first time!

**Quizzes** – These may be announced or unannounced. There will not be any retakes on quizzes.

**Homework** – Most homework assignments will be collected. Due dates will be given at the time the assignment is made. We will also have homework learning checks (see below). Homework handed in late (including late but on the same day) will be penalized 10% per day late.

**Homework Learning Checks (HLCs)** – These short assessments will consist of problems similar to those on recent homework assignments. All work must be shown.

**Semester Exam** – You will be given a semester test during exam days at the end of the first semester. There will be a final, cumulative exam at the end of second semester, but it will be given over 2 days of class time. Each will be 20% of your semester grade.

**Extra Credit** - I may make small amounts of extra credit available at various times during the year – but don't count on it. Extra credit will not be available during the last week of each semester. When extra credit is assigned a due date, none will be accepted late.

**Note:** Assessments for this course are designed to be completed within an allotted time and in a single sitting. You will not be given additional time to complete assessments, nor will you be allowed to begin an assessment, leave and then return to it later.

**Grading Scale:** Grades are determined by the total number of points earned divided by the total number possible.

93.0 – 100%	A	83.0 – 86.99	B	73.0 – 76.99	C	63.0 – 66.99	D
90.0 – 92.99	A-	80.0 – 82.99	B-	70.0 – 72.99	C-	60.0 – 62.99	D-
87.0 – 89.99	B+	77.0 – 79.99	C+	67.0 – 69.99	D+	Below 60%	

## **COMMUNICATION PLAN**

PowerSchool will be updated frequently so you can keep track of your grade. If you have any questions now or in the future, feel free to email me at [kweires@dbqschools.org](mailto:kweires@dbqschools.org) or call me at 552-5352.