



## Marine Science Magnet High School

130 Shennecossett Road ⚓ Groton, CT  
860.446.9380  
www.msmhs.com

### **MTH0179 – AP Calculus BC**

2019-2020

B Day, **Period 7**, Room U101

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#### **Course Description:**

This course includes all topics covered in Calculus AB plus additional topics focusing on the calculus of functions of single variable. AP Calculus BC is the study of limits, derivatives, definite and indefinite integrals, polynomial approximations and infinite series. Though this is considered a study of single variable calculus, parametric, polar, and vector functions will be studied. Consistent with AP philosophy, concepts will be expressed and analyzed geometrically, numerically, analytically, and verbally. Students taking this course must take the corresponding national Advanced Placement Exam in May.

#### **Student Learning Expectations and Outcomes:**

*The following MSMHS Learning Expectations are the focus of the Mathematics Program, however, there are several other learning expectations aligned with various assignments within the courses offered in the Mathematics Program.*

- 1. Read and write effectively for a variety of purposes.***
- 2. Speak effectively with a variety of audiences in an accountable manner.***
- 3. Make decisions and solve problems independently and collaboratively.***
- 5. Contribute to a positive learning environment with respect and responsibility.***

#### **Materials Needed:**

Three Ring Binder, 7 Tab Dividers (one for each unit of study), Pens/Pencils, Paper, TI-84 Calculator, MSMHS Laptop

### **Advanced Academic Programs**

The Advanced Placement (AP) Program and the Early College Experience (ECE) program at the Marine Science Magnet High School are intended to challenge and prepare students for the rigors of college. Students enrolled in courses designated as both AP and ECE must be enrolled in both programs and pay both fees associated with the courses to receive MSMHS credit. AP and ECE classes are assigned a higher weight to the GPA scale, assist students with earning college credit, and strengthen student transcripts during the college admissions process. Furthermore, students must take the Advanced Placement exam in order to receive credit for an AP or AP/ECE course. In order to receive these added academic benefits, it is expected that students will subscribe to the understanding that the academic rigor and teacher expectations will be higher than that of the Honors level. Students must obtain and fully complete the summer assignments which may be distributed while being self-motivated to study and prepare over and above scheduled course meetings.

### **Advanced Placement (AP) Program**

Students who are enrolled in an AP class must register and take the Advanced Placement Exam in the spring. Students must be enrolled in the AP course in order to take the AP exam. Payment for the AP tests must be completed by the second week of September, 2020. Advanced Placement exams are administered at MSMHS and are scheduled as follows:

Calculus AB - Tues., May 4, 2021; 8 a.m.

Calculus BC - Tues., May 4, 2021; 8 a.m.

English Literature & Composition- Wed., May 5, 2021; 8 a.m.

United States History- Thurs., May 6, 2021; 8 a.m.

Art History- Thurs., May 6, 2021; 12 p.m.

Chemistry- Fri., May 7, 2021; 8 a.m.

Spanish Lang. & Culture- Tues., May 11, 2021; 8 a.m.

Psychology- Tues., May 11, 2021; 12 p.m.

English Language & Composition- Weds., May 12, 2021; 8 a.m.

Microeconomics- Weds., May 12, 2021; 12 p.m.

Computer Science Principles- Thurs., May 13, 2021; 8 a.m.

Statistics- Thurs., May 13, 2021; 12 p.m.

Biology- Fri., May 14, 2021; 8 a.m.

### **Classroom Behavior and Rules:**

Students, teachers, and administrators have the right to expect mutual courtesy, fair and equitable treatment and to be informed of their rights and responsibilities. The goal of the Marine Science Magnet High School is to assist students in developing self-direction, self-discipline, and self-management and to provide opportunities for responsible decision-making. However, in the pursuit of these goals, those students who infringe on the rights of others, or who violate school policies and regulations, will be subject to discipline. The constitutional rights of students and staff shall be preserved and protected.

The conduct of students in school has an important effect on the student's academic achievement, and others in the classroom and the greater school learning environment. While ultimate responsibility for student behavior rests with the parents and the students themselves, the school has an obligation to provide leadership in this respect and to insure that appropriate standards are maintained when students are under school supervision. When anyone's rights are violated or when someone violates the rules and regulations, we must all be concerned. MSMHS is committed to providing a safe, respectful, and nurturing environment in which all students can learn.

### **Tardy Policy**

“Tardy” is defined as being late to school, class or activity without permission of school personnel. Students who arrive to school after 7:30 a.m. must report to the main office. Teachers will not allow students admittance to class after 7:30 without a tardy pass from the office. Oversleeping or missing the bus are not acceptable excuses. Tardies will be dealt with as follows, per semester:

- *1<sup>st</sup> tardy – pass will be given*
- *2<sup>nd</sup> tardy – pass will be given*
- *3<sup>rd</sup> tardy – Final warning - student will have a tardy conference with the Assistant Principal; parent/guardian notified to discuss consequences of continued tardies*
- *4<sup>th</sup> tardy - office detention*
- *5<sup>th</sup> tardy – office detention*
- *6<sup>th</sup> tardy – parent/guardian and student meeting with the Assistant Principal, double office detention, parking privileges revoked and late arrival/early dismissal privilege removed for the remainder of the semester*
- *7<sup>th</sup> tardy – two office detentions*
- *8<sup>th</sup> tardy – two office detentions*
- *9<sup>th</sup> tardy – parent/guardian and student meeting with the Assistant Principal; possible referral to proper authorities; notification of loss of credit*
- *10<sup>th</sup> tardy – loss of 0.5 credit in appropriate class*

### **Homework and Absences**

**Students are responsible for obtaining and completing all homework assignments during the time they are absent, as well as obtaining any materials needed to complete the assignments. Any exceptions must be discussed with the classroom teachers. Students are expected to communicate with their teachers about their absences and expected work.**

### **Make-Up Work**

Students who have been absent are required to consult their classroom teachers about work missed as a result of absence. Students will need to make up missed assignments in a timely manner or in the time specified by the classroom teachers. When absent, the student is responsible for work previously assigned and due on the day he/she returns (unless excused by the teacher). Students who receive discipline for cutting class must make up the work but may not receive credit for the completed work. Students returning from suspension must complete missing work and/or tests/quizzes within the same number of days as the suspension served. For example, a student suspended for three days has three days in which to make up the work.

### **Late Work**

All teachers will accept late work one week prior to the end of the appropriate quarter as listed on the school calendar available in the Parent-Student Handbook; 50% is the maximum penalty for a late submission. In order to be accepted, the work must be complete and meet all assignment requirements.

### **Assignments and Grading:**

Grading of student performance in courses is based on a fifty-point scale. Overall evaluation in a course is measured in a number of ways: class participation, homework, written work, performance assessments and subjective and objective testing at intervals during the course.

MSMHS teachers create common syllabuses that contain specific policies and procedures specific with to their department's PLCs. Grading is scaled in a uniform manner which allows for a simplistic approach for students and parents to follow. Below is the breakdown of the grading scales for assignments and assessments:

<i>Homework:</i>	<i>10 pt. increments</i>
<i>Classwork:</i>	<i>10 pt. increments</i>
<i>Quiz:</i>	<i>100 pts.</i>
<i>Test:</i>	<i>200 pts.</i>
<i>Lab/Lab Reports:</i>	<i>100 to 200 pts.</i>
<i>Papers/Projects:</i>	<i>100 to 200 pts.</i>
<i>Unit Tasks:</i>	<i>100 to 200 pts.</i>
<i>Midterms &amp; Finals:</i>	<i>400 pts.</i>

Teachers may adjust the amount of points per assignments based upon the rigor, complexity, or time needed to complete the task. Teachers may also announce that homework assignments are worth additional points the day the assignment is due as a "pop quiz." These pop homework assignments are used to ensure that students are putting maximum effort into their homework and classwork assignments.

### **Extra Help:**

Students interested in receiving extra help from teachers, or in meeting with their teacher before or after school, need to schedule a mutually agreed upon time to meet with their teacher. Teachers may require specific procedures for requesting appointments for extra help. Please know that teachers will only be able to meet with students on Wednesdays for a limited time due to regularly scheduled faculty or Professional Learning Community (PLC) meetings beginning at 2:30 pm. All teachers will explain the desired procedures in their course syllabus.

### **Retakes/Extra Credit Policy**

The MSMHS Mathematics Department follows a common policy and will allow retakes at the discretion of the teacher.

**Retake Policy:** The Mathematics Department will allow retakes on assessments provided the student creates a learning plan that is approved by the teacher. The student must reach out to the teacher with the plan if they would like to retake the assessment. The retake score will replace the original score.

### **Cell Phones**

Cell phones are permitted in school, however, while in class all cell phones must remain in their backpack and on "silent" unless requested to be turned off by the teacher or administrator. Cell phones may be used in class if authorized by the teacher or staff member in the delivery of curriculum and instruction. If a teacher determines a student's phone needs to be taken away due to the student not adhering to the classrooms rules, the phone will be taken by the teacher and kept in a secure location in the classroom until it is returned to the student. If the student refuses to give up his/her phone, the student will be referred to administration as being insubordinate. Cell phones may be used before, during lunch, or after school hours.

### **Grade/Grade Reporting:**

Grading of student performance in courses is based on a fifty-point scale. Overall evaluation in a course is measured in a number of ways: class participation, homework, written work, performance assessments and subjective and objective testing at intervals during the course. Course grades are an average of quarter grades that includes final exams.

The following table shows the letter grades equivalent to numerical grades and GPA.

<b>Letter</b>	<b>Numerical Equivalent</b>	<b>GPA Equivalent</b>	<b>Honors Weighting</b>	<b>AP/ECE Weighting</b>
A+	97-100	4.3	4.52	4.73
A	93-96	4.0	4.20	4.40
A-	90-92	3.7	3.89	4.07
B+	87-89	3.3	3.47	3.63
B	83-86	3.0	3.15	3.30
B-	80-82	2.7	2.84	2.97
C+	77-79	2.3	2.42	2.53
C	73-76	2.0	2.10	2.20
C-	70-72	1.7	1.79	1.87
D	65-69	1.0	1.05	1.10
F	50-64	0.0	0.0	0.0
P	65-100	-----	-----	-----

## **Academic Integrity:**

To support academic integrity, MSMHS may use a technology tool for plagiarism prevention such as Turnitin.com. Students are required to submit major papers to this service and receive guidelines and training in its use if requested by the teacher. All work submitted by students should be a true reflection of their effort and ability. If submitted work or tests are not, then the student has manifested unacceptable academic behavior.

### **Plagiarism**

Plagiarism is defined as intentionally or unintentionally presenting another's work as your own. Any source material (electronic, written, verbal) accessed to complete an assignment must be cited. Plagiarism includes the following:

- Copying verbatim or blending source material with your own without proper attribution,
- Paraphrasing source materials or borrowing ideas, terms, or concepts without acknowledging the source,
- Inventing sources or false attributions for sources,
- Supplying/selling your work to another or purchasing/copying another's work.

### **Cheating**

Cheating is defined as copying all or part of an assignment or assessment or allowing another to copy your work. It is also doing someone's work or having someone else do your work. Cheating includes the following:

- Using unauthorized materials, devices, or assistance of any kind to complete your work or assessment, including on-line transfers,
- Collaborating on a task without the teacher's authorization, as well as providing or receiving information so as to give/gain an unfair advantage,
- Aiding another in cheating.

### **Other Academic Misconduct**

Other forms of serious academic misconduct include:

- Altering grades,
- Stealing or obtaining test/assessment materials or answers,
- Submitting the same (or nearly the same) work for more than one class without disclosure or approval,
- Falsifying information on school related documents and forms.

ANY behavior that can be defined as cheating/plagiarism represents a violation of mutual trust and respect essential to education at MSMHS. Students suspected of cheating should expect to be questioned by their teacher. Students violating this rule are subject to the following penalties:

- A "zero" on the submitted work; notification of parents; written summary of event and action taken placed in the student file.
- If a student is found to have cheated/plagiarized a second time or is involved in a particularly serious act of cheating/plagiarism, the student will be referred to administration for appropriate penalties beyond those listed above. Additional penalties include such consequences as notification to award and scholarship committees; suspension from class or school and notification to the student's prospective colleges; loss of or disqualification from honors/privileges and positions (e.g. NHS, school leadership position).

## **Course Unit Outline - Enduring Understandings and Tentative Dates:**

*Note: Teacher has discretion to change throughout the year.*

### **Unit I – Limits, Continuity and Derivatives**

September 2020

#### **Enduring Understandings**

- A concept of a limit allows you to determine the value of a function by getting really close to a specified value.
- A function's continuity at a given point affects its limit.
- Derivatives can be used to analyze curves and model rates of change.
- Finding the derivative of a function may require the use of several rules, including rules for: sums, products, quotients, powers.
- The derivative of the composition of functions can be found using the chain rule.
- Implicitly defined functions can be differentiated

### **Unit II – Application of Differentiation**

September - October 2020

#### **Enduring Understandings**

- The physics concepts of position, velocity and acceleration are related mathematically by the derivative
- Rates of change of certain functions can be determined by other rates of change
- Every function has extrema and critical points
- The graphs of  $f$ ,  $f'$ , and  $f''$  are related in many ways
- Derivatives and Antiderivatives are used in optimizing situations in mathematics, business, and economics

### **Unit III – Integration and Accumulation of Change**

October – November 2020

#### **Enduring Understandings**

- Finite sums can be used to estimate distance traveled and displacement
- Riemann Sums can be used to estimate areas under the curve
- The area under a curve can be found by hand using the Fundamental Theorem of Calculus.
- There are several methods to evaluating integrals by hand.

### **Unit IV – Differential Equations**

November – December 2020

#### **Enduring Understandings**

- Slope fields can give an approximation of a curve using slopes at different points.
- Differential equations can be solved to find the original function.
- There are many natural phenomena when quantities grow or decay at a rate proportional to their size.

### **Unit V – Application of the Definite Integral**

January 2021

#### **Enduring Understandings**

- The average value of a function can be found using integrals.
- Integrals are used to determine net change.
- The area between two curves can be found by subtracting their integrals.
- When curves are revolved around an axis, they create 3 dimensional figures.

## **Unit VI – Parametric Equations and Polar Coordinates**

February 2021

### Enduring Understandings

- There is a distinct relationship between function, parametric and polar modes for presenting functions and their graphs.
- Methods for calculating derivatives and integrals of real-valued functions can be extended to vector-valued function
- There are specific methods to finding the derivative and integral of parametric and polar equations.

## **Unit V – Infinite Sequences and Series**

March - April 2021

### Enduring Understandings

- Sequence and series are a useful way to study patterns and functions.
- Power series represent functions and encode their coefficients which are a sequence.
- There are several tests that can be performed on series to determine convergence or divergence.