** CABRILLO HIGH SCHOOL**

*Home of the Conquistadores*

**Math/AP Calculus AB: 2019-2020/Semester 1 and 2**

**Mrs. Phillips**

*e-mail: phillips.tracy@lusd.org*

phone: 742-2900

Office Hours: Before School: 7:20 – 7:40

 7th Period and after school: 1:45 – 3:00

**Introduction**

AP**®** Calculus is concerned with developing the student’s understanding of the concepts of calculus and providing experiences with its methods and applications. The course emphasizes a multi-representational approach to calculus, with concepts, results, and problems being expressed graphically, numerically, analytically, and verbally. The connections between these representations are important. Broad concepts and methods are emphasized, not memorization and manipulation.

Calculus is fundamentally different from the mathematics studied previously. Calculus is less static and more dynamic. It is concerned with change and deals with quantities that approach other quantities. This is a very useful form of mathematics and is utilized daily in activities as varied as determining satellite orbits, forecasting weather, and calculating interest rates and earnings. In this course, along with learning the basics of calculus, students will explore many of these applications.

**Course objectives/key learning outcomes**

Upon completion of this course students will be able to:

1. Understand the major problems of differential and integral calculus.
2. Understand the importance of linear functions in mathematics.
3. Understand and recognize other important classes of functions (such as trig and rational functions), and be able to use calculus fluidly with these functions.
4. Appreciate how calculus allows us to solve important practical problems in an optimal way.

**Sequence of topics/units**

Unit 1: Pre-calculus Review (2-3 weeks)

Lines/ Functions and graphs/ Exponential and logarithmic functions/ Trigonometric functions

Unit 2: Limits and Continuity (3 weeks)

 Rates of Change/ Limits at a point/ Limits involving infinity/ Continuity/ Instantaneous rates of change

Unit 3: The Derivative (5 weeks)

Definition of the derivative/ Differentiability/ Derivatives of algebraic functions/ Derivative rules when combining functions/ Applications to velocity and acceleration/ Derivatives of trigonometric functions/

The chain rule/ Implicit derivative/ Derivatives of inverse trigonometric functions/ Derivatives of logarithmic and exponential functions

Unit 4: Applications of the Derivative (4 weeks)

 Extreme values/ Using the derivative/ Analysis of graphs using the first and second derivatives/

Optimization problems/ Linearization models/ Related Rates

Unit 5: The Definite Integral (3 weeks)

 Approximating areas/ The Fundamental Theorem of Calculus / Definite integrals and antiderivatives

Unit 6: Differential Equations and Modeling ( 3 weeks)

Antiderivatives/ Integration using u-substitution/ Separable differential equation

 Unit 7: Applications of Definite Integrals (3 weeks)

Summing rates of change/ Particle motion/ Areas in the plane/ Volumes

**Assignments/Projects**

Within each unit there will be at least one quiz and exam. There will also be a cumulative final exam at the end of the semester. In addition, the AP Exam will be administered in May by the College Board.

**Instructional Materials**

Pencil, pen, highlighter, lined paper and graphing calculator. \*All students have a textbook that should be kept at home. We have a class set that will be used at school\*

**Instructional Structure of the Class**

During each class the previous night’s homework will be reviewed and new material presented. Tests and/or quizzes will be given during and at the end of each instructional unit. Students are encouraged to work cooperatively on both class work and homework.

**Progress Monitoring**

Grades will be based on the total points earned on test (70%), quizzes (15%), and class and homework (15%). The grading scale is as follows:

 90 - 100 % A

 80 – 89 % B

 70 – 79 % C

 60 – 69 % D

Grades will be updated weekly and posted on the LUSD Q website as well as in the classroom.

**Homework Policy**

Homework will be assigned daily. The intent of homework is not to keep students busy but to provide the necessary practice to master a difficult subject. Students are expected to turn in their own work (not “borrowed” work from other students or from the internet). Students will not be graded based on “right or wrong” answers but on effort. Late work will be accepted if submitted with a ticket.

**Support/Intervention**

I am available before school or after school for help. In addition, all class notes and assignments can be accessed from my faculty page on the Cabrillo website ( [www.lusd.org/chs](http://www.lusd.org/chs) ).

**Classroom Norms**

As this is a lab class, all lab safety rules outlined in class must be strictly adhered to. In addition, students are expected to follow the classroom norms listed below:

Be Prompt – in your seat when the bell rings

 Be Prepared – bring materials to class EVERYDAY

 Be Productive – turn **cell phones off**, follow directions, and do not leave the room without

 permission

 Be Positive – have a good attitude

 Be Polite – be kind to others

Five tickets will be issued to each student at the beginning of the semester. Tickets will be forfeited for tardiness, to turn in late work, or for behavioral infractions. Tickets remaining at the end of the semester can be redeemed for extra credit. Tickets will be taken from students who fail to meet these expectations.

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**Student Signature Date**

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**Parent Signature Date**