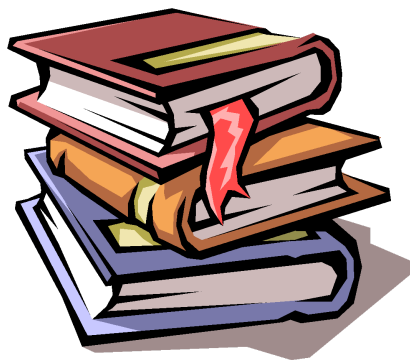




CALCULUS BC
2026 – 2027
BREA OLINDA HIGH SCHOOL
MRS. COLLIER
ROOM 142

INTRODUCTION:

Calculus BC is a two-semester course whose purpose is to teach students about the following four Big Ideas: Limits, Derivatives, Integrals, and Series. The course will provide opportunities for students to:

- 1) Reason with definitions and theorems
- 2) Connect concepts and processes
- 3) Implement algebraic and computational processes
- 4) Engage with graphical, numerical, analytical and verbal representations and demonstrate connections among them
- 5) Build notational fluency
- 6) Communicate mathematical ideas in words, both orally and in writing
- 7) Use calculators to solve problems
- 8) Use a graphing calculator to explore and interpret calculus concepts

EDUCATIONAL MATERIALS:

The textbook is Calculus for AP with CalcChat and CalcView by Ron Larson and Paul Battaglia (board approved; district adopted textbook). A graphing calculator, sufficient writing supplies, a binder, flash cards, and plenty of paper is needed every day. You will also need a school Gmail account to join the Google classroom and sign up for REMIND through text or email.

STUDENT EVALUATION:

Students will be evaluated in four areas:

- 1) Homework/Classwork/Labs (20%),
- 2) Quizzes (20%),
- 3) Tests (40%),
- 4) Final (20%).

Grading scale (no exceptions):

A = 89.5-100%

B = 79.5-89.4%

C = 69.5-79.4%

D = 59.5-69.4%

F = 0-59.4%

COURSE OUTLINE:

Unit 1: Limits (1 week)

- Find limits graphically and numerically.
- Evaluate limits analytically.
- Continuity and one-sided limits
- Intermediate Value Theorem
- Infinite limits and vertical asymptotes
- Limits at Infinity (horizontal asymptotes)

Unit 2: Differentiation (2 weeks)

- The derivative and the tangent line problem
- Differentiability and continuity
- Basic differentiation rules and rates of change (average and instantaneous)
- Product and Quotient Rules and Higher Order derivatives
- The Chain Rule
- Implicit differentiation
- Related Rates

Unit 3: Applications of Differentiation (3 weeks)

- Extrema on an interval
- Rolle's Theorem and the Mean Value Theorem
- Increasing and decreasing functions
- The First Derivative Test
- Concavity and points of inflection
- The Second Derivative Test
- Summary of Curve Sketching (including monotonicity)
- Optimization problems
- Differentials

Unit 4: Integration (3 weeks)

- Antiderivatives and indefinite integration
- Area
- Riemann Sums and Definite Integrals
- The Fundamental Theorem of Calculus
- Integration by Substitution
- The Natural Logarithmic Function: Integration
- Inverse Trigonometric Functions: Integration

Unit 5: Differential Equations (2 weeks)

- Slope Fields and Euler's Method
- Growth and Decay
- Separation of Variables
- Logistic Equation

Unit 6: Applications of Integration (2 weeks)

- Area of a Region Between Two Curves
- Volume: The Disk and Washer Methods
- Volume: The Shell method
- Arc Length and Surfaces of Revolution

Unit 7: Integration Techniques and L'Hopital's Rule (4 weeks)

- Basic Integration Rules
- Integration by Parts
- Partial Fractions
- Integration by Tables and Other Integration Techniques
- Indeterminate Forms and L'Hopital's Rule
- Improper Integrals

1st Semester Final Exam: The final exam includes problems from past AP exams that test the students' abilities to connect concepts graphically, analytically, numerically, and verbally. This exam determines 20% of the student's semester grade. This test will be given over two days. The first day will be Multiple Choice with Calculators (50 minutes), second day will be Multiple Choice and FRQ with no Calculators (75 minutes).

Second Semester

Unit 8: Infinite Series (6 weeks)

- Sequences
- Series and Convergence
- The Integral Test and p-Series
- Comparison of Series
- Alternating Series
- The Ratio and Root Tests
- Taylor Polynomials and Approximations
- Power Series
- Representation of Functions by Power Series
- Taylor and Maclaurin Series

Unit 9: Parametric Equations, Polar Coordinates, and Vectors (4 weeks)

- Conics and Calculus
- Plane Curves and Parametric Equations
- Parametric Equations and Calculus
- Polar Coordinates and Polar Graphs
- Area and Arc Length in Polar Coordinates
- Vectors in the Plane
- Vector- Valued Functions
- Velocity and Acceleration

Unit 10: AP Review (3 weeks)

- Fast Track to a 5
- Practice Released tests: 2000 to present

Unit 11: Projects/Final (4 weeks)

- Final will consist of 30 questions multiple choice with a calculator (75 min)
- Applying Calculus to Real Life Project and Presentation

RULES:

1. Respect every member of the class, by using appropriate language, by paying attention when another person is speaking, and by raising his/her hand to speak.
2. There is a zero tolerance cell phone policy in my classroom. In order to have a fulfilling classroom experience complete with verbal communication, eye contact, and an opportunity to work on listening and speaking skills, cell phones should be stored for the entirety of each class period. From bell to bell, cell phones and ear buds should remain in bags, purses, and pockets.
3. Be in the classroom when the bell rings.
4. Always come prepared to learn with the book, paper, pencil, and other necessary mathematical tools.
5. Pay attention and follow directions.
6. Learn and think independently.

Thank you in advance for respecting my decision to establish a healthier and more engaging learning environment.

ATTENDANCE/TARDY POLICY:

- Mrs. Collier will enforce the school policy on attendance.

CLASSWORK/HOMEWORK POLICY:

Homework will be assigned daily. Students will be expected to **show all work** necessary to demonstrate understanding of the problems. Each homework assignment should have a proper heading with the student's name, date, and period on the right side and the assignment number and assignment on the left side.

Late work will be worth less everyday it is not turned in unless there is an excused absence.

You have 5 school days to turn it in for credit. Each homework assignment must be legible, if not you will have to redo it for late credit.

MAKE-UP WORK:

All make-up work from an excused absence is accepted for full credit only two school days after the absence took place. All make-up work will be turned in on my desk in the bin. If you are absent please refer to the weekly calendar posted on the side wall for all make-up work. If handouts are needed ask Mrs. Collier, this can be done before or after class, during lunch, or after school.

ROUTINES AND PROCEDURES:

- All students should ask to leave their seats for any reason. (Example: to go to the restroom, sharpen your pencil, throw away garbage, etc.)
- If students need extra individual help they should communicate to the teacher.
- Every student should bring paper, pencils, erasers, calculators, books, and other necessary tools everyday NO EXCEPTIONS.
- All students should take notes while the teacher is lecturing and ask questions when confused.
- When students are placed in groups they should use their inside voices, respect others opinions, and keep on task.
- Students are only excused to leave the classroom when the teacher excuses them not when the bell rings!
- Mrs. Collier will not tolerate any cheating or dishonest behavior and will follow the school rules and consequences if a student chooses to go down that road.

BOHS MISSION STATEMENT:

The Brea Olinda High School community believes that education is the cornerstone of a better world. Our mission is to provide an effective, comprehensive education for every student which fosters high academic achievement, positive self-worth and responsible citizenship in an environment of mutual respect, trust and cooperation among students, staff and parents.

ACADEMIC DISHONESTY, CHEATING & PLAGIARISM:

Academic dishonesty or cheating is defined as the act of obtaining or attempting to obtain credit for work by dishonest, deceptive, fraudulent, or unauthorized means.

- Mrs. Collier will enforce the school policy

CONTACT INFORMATION:

Mrs. Collier

Room Phone: (714) 990-7850 x2142

Email: jcollier@bousd.us

Students must initial each statement:

- 1) I understand the Cell Phone/Ear Buds policy. _____
- 2) I understand the Tardy policy. _____
- 3) I understand that no grades will be rounded outside of the grading scale. . _____
- 4) I understand that all assignments will not be accepted after 5 school days. _____
- 5) I understand that Mrs. Collier is very easy to communicate with outside of school hours. I can email her or send a message through Remind.

- 6) I understand that my homework must be readable or I will have to redo it and get late credit.

- 7) I understand that when I am absent that I am responsible to get my make-up work and watch the Google classroom video of the lesson.

Student's Name: _____ Signature: _____

Parent's Name: _____ Signature: _____

I have read the curriculum paper and understand the course requirements. If you need to consult with me regarding my child,

Please call this daytime # _____

or email at _____.