

R: RIGOR R: RELEVANCE R: RELATIONSHIP**BAPTIST HILL MIDDLE HIGH SCHOOL**

HOME OF THE BOBCATS
CHARLESTON COUNTY SCHOOL DISTRICT

SUCCESS BY CHOICE, NOT BY CHANCE

Mrs. Janet Hadley

Calculus

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843-889-2276 Ext. 28560

Tutoring Hours: Thursdays 2:30-3:30

Office Hours: Mon to Fri / 12:55 – 2:25 pm

Instructional Philosophy: I believe that every student has the ability to succeed at math, although at different academic levels and with different learning styles. Therefore, my responsibility as a teacher is to assess at what level and with what style of instruction each student learns best, and then to use different teaching techniques to reach each student in my classroom. I also believe that part of my teaching responsibility is to encourage and motivate each student to achieve to his/her highest potential.

Course Description

This course involves the continued study of functions, rates, and accumulation. Students will study limits, continuity, derivatives, applications of derivatives (related rates, curve-sketching, and optimization), integrals, and applications of integrals. This course provides depth in rigor, complexity, challenges, and creativity beyond the standard level course as outlined in the **Profile of the South Carolina Graduate**. Be more challenging than standard level courses in order to foster growth for advanced learners. Offer a differentiated program of study that provides an array of opportunities for all students based on their aptitudes, achievement, and interests. This Calculus course, known as the AB part, is equivalent to a first semester college Calculus course. This course will be challenging and demanding, but exciting and rewarding at the same time. If you score a 3, 4, or 5 on the AP Exam at the end of the year, you can earn college credit for this course.

Honors Calculus Unit Overviews

Unit Title	SCCCR Standards	
Unit 1 Limits and Continuity	C.LC .1	Understand the concept of a limit graphically, numerically, analytically, and contextually. <ol style="list-style-type: none"> Estimate and verify limits using tables, graphs of functions, and technology. Calculate limits, including one-sided limits, algebraically using direct substitution, simplification, rationalization, and the limit laws for constant multiples, sums, differences, products, and quotients. Calculate infinite limits and limits at infinity. Understand that infinite limits and limits at infinity provide information regarding the asymptotes of certain functions, including rational, exponential and logarithmic functions.

	C.LC .2	<p>Understand the definition and graphical interpretation of continuity of a function.</p> <p>a. Apply the definition of continuity of a function at a point to solve problems.</p> <p>b. Classify discontinuities as removable, jump, or infinite. Justify that classification using the definition of continuity.</p> <p>c. Understand the Intermediate Value Theorem and apply the theorem to prove the existence of solutions of equations arising in mathematical and real-world problems.</p>
Unit 2 Derivatives Rules and Graphs	C.D. 1	<p>Understand the concept of the derivative of a function geometrically, numerically, analytically, and verbally.</p> <p>a. Interpret the value of the derivative of a function as a slope of the corresponding tangent line.</p> <p>c. Approximate the derivative graphically by finding the slope of the tangent line drawn to the curve at a given point and numerically using the difference quotient.</p> <p>d. Understand and explain graphically and analytically the relationship between differentiability and continuity.</p> <p>e. Explain graphically and analytically the difference between the average rate of change and the instantaneous rate of change.</p> <p>f. Understand the definition of the derivative and use this definition to determine the derivatives of various functions.</p>
	C.D. 2	<p>Apply the rules of differentiation to functions.</p> <p>a. Know and apply the derivatives of constant, polynomial, radical, and rational functions.</p> <p>b. Use the constant multiple, sum, difference, product, quotient, and chain rules to find the derivatives of functions.</p>
	C.D. 3	<p>Apply theorems and rules of differentiation to solve mathematical and real-world problems.</p> <p>b. Write an equation of a line tangent to the graph of a function at a point.</p>
Unit 3 Derivatives of Special Functions and Applications	C.D. 1	<p>Understand the concept of the derivative of a function geometrically, numerically, analytically, and verbally.</p> <p>b. Interpret the value of a derivative as an instantaneous rate of change in a variety of real world contexts such as velocity and population growth.</p> <p>e. Explain graphically and analytically the relationship between average rate of change and instantaneous rate of change.</p> <p>f. Understand the definition of the derivative and use this definition to determine the derivatives of various functions.</p>

	C.D. 2	<p>Apply the rules of differentiation to functions.</p> <p>a. Know and apply the derivatives of trigonometric, exponential, and logarithmic functions.</p> <p>b. Use the constant multiple, sum, difference, product, quotient, and chain rules to find the derivatives of functions.</p>
	C.D. 3	<p>Apply theorems and rules of differentiation to solve mathematical and real-world problems.</p> <p>a. Explain geometrically and verbally the mathematical and real-world meaning of the Mean Value Theorem.</p> <p>b. Write an equation of a line tangent to the graph of a function at a point.</p> <p>e. Solve a variety of real world problems involving linear approximation and rates of change.</p>
Unit 4 Implicit Differentiation and Related Rates	C.D. 2	<p>Apply the rules of differentiation to functions.</p> <p>a. Know and apply the derivatives of inverse trigonometric functions.</p> <p>c. Understand and apply the methods of implicit and logarithmic differentiation.</p>
	C.D. 3	<p>Apply theorems and rules of differentiation to solve mathematical and real-world problems.</p> <p>e. Solve a variety of real world problems involving related rates.</p>
Unit 5 Graph analysis and optimization	C.D. 3	<p>Apply theorems and rules of differentiation to solve mathematical and real-world problems.</p> <p>a. Explain geometrically and verbally the mathematical and real-world meanings of the Extreme Value Theorem.</p> <p>c. Explain the relationship between the increasing/decreasing behavior of f and the signs of f'. Use the relationship to generate the graph of f given the graph of f' and vice versa, and to identify relative and absolute extrema of f.</p> <p>d. Explain the relationship among the concavity of the graph of the graph of f, the increasing/decreasing behavior of f', and the signs of f''. Use those relationships to generate graphs of f given any one of them and identify the points of inflection of f.</p> <p>e. Solve a variety of real-world problems involving optimization.</p>

Unit 6 Integrals	C.1.1	Understand the concept of the integral of a function geometrically, numerically, analytically, and contextually. a. Explain how the definite integral is used to solve area problems. b. Approximate definite integrals by calculating Riemann sums using left, right, and midpoint evaluations, and using trapezoidal sums. c. Interpret the definite integral as a limit of Riemann sums. d. Explain the relationship between the integral and derivative as expressed in both parts of the Fundamental Theorem of Calculus. Interpret the relationship in terms of rates of change.
	C.1.2	Apply theorems and rules of integration to solve mathematical and real-world problems. b. Explain graphically and verbally the properties of the definite integral. Apply these properties to evaluate basic definite integrals. c. Evaluate integrals using substitution.
Unit 7 Integral Applications	C.1.2	Apply theorems and rules of integration to solve mathematical and real-world problems. a. Apply the Fundamental Theorems of Calculus to solve mathematical and real-world problems.

South Carolina College and Career-Ready Mathematical Process Standards

1. Make sense of problems and persevere in solving them.
2. Reason both contextually and abstractly.
3. Use critical thinking skills to justify mathematical reasoning and critique the reasoning of others.
4. Connect mathematical ideas and real-world situations through modeling.
5. Use a variety of mathematical tools effectively and strategically.
6. Communicate mathematically and approach mathematical situations with precision.
7. Identify and utilize structure and patterns.

Web Sites that will be used: IXL.com, ALEKS.com, KHAN Academy

Make-Up Policy: Students have 5 days to contact their teacher and make up any missing work (IF THE ABSENCE WAS EXCUSED) when they return from being absent. It is the **student's responsibility**. There will be no makeup work accepted after the 5 days. There will be an exception made for students with chronic illness or valid circumstances for which they were absent. Their makeup period will be decided by collaboration with guidance, the teacher, parent(s), and administration when necessary.

Grading Procedures: Students' grades will be based on a percent system:

- Home Work 10%
- Class Work 20%
- Quizzes 30%
- Tests 40%

GRADE SCALE

A = 90-100 B = 80-89 C = 70-79 D = 60-69 F = 0-59

Categories that compile your quarter and semester grade:

Classwork: Everything that we do in class will not be graded. Some grades will be participation only / some classwork assignments will be graded for correctness. Anytime that we do a project in class, that grade will count in this category. You will earn a classwork grade of some type almost every day we meet. These will be averaged and entered in power school at the end of the week.

Homework: This grade will really be a “journal” grade, combined with any homework that is assigned in the course. I will provide each of you with a journal, which will stay on the bookshelf in my room. You will put your daily bell ringers in this journal, being careful to follow the directions on the board. I will grade them at the end of each week. The good news is, if you follow directions, this part of your grade will always be a 100%! 😊

Quizzes: These are informal assessments, on which you can use your notes. Quizzes may be announced or unannounced. Sometimes you will be allowed to work with classmates on quizzes, and sometimes you will work alone. Quizzes will generally be given once a week.

Tests: These are formal assessments. Usually, there will be no notes allowed on a test. Sometimes there will be formula sheets given for a test, or you will be allowed to construct a note card with information that you think will be helpful on the test. Tests will generally be given every two weeks.

Re-Test Policy: If you make below a 70% on a test, you can get help on the material that you did not understand and then retake the test. The two scores will be averaged together, regardless of which one is higher or lower. It is your responsibility to request a re-test and schedule a time with me to take it.

Tutoring Opportunities: I will be available to help you at the following times:

- during class / more than half of each class will involve you working on assignments or projects while I circulate around the classroom to answer your questions and help you
- at lunch, if you tell me that you are coming and I don't have lunch duty that day
- after school on any Thursday, unless I have a schedule conflict (which will be rare and always announced beforehand)
- after school on some other day, if you tell me you are coming and I don't have a schedule conflict



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Algebra II

Probability and Statistics

Pre - Calculus (H)

AP Calculus

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Please return this form with the appropriate signatures. This form is proof that you have received, read and understood the requirements for this course as well as some of the school policies for making up assignments, tests, quizzes, etc.

If you have any questions or concerns, please contact Mrs. Hadley by email, phone and/or conference.

I have received, read and understand the course requirements and procedures for these courses: Algebra II, Prob/Stats, Pre-Calculus, and AP Calculus

Parent Signature

Date

Student Signature

Date

Printed Student Name: _____