Chesapeake Bay Governor's School
For Marine and Environmental Science
Warsaw Campus

Calculus with Analytic Geometry I (MTH 173)

Fall 2015 – Spring 2016

Mark D. King

Course Description:
This course is taught over both semesters of the senior year and can be divided conceptually into two parts. In the first part, Students will determine limits both graphically and numerically, which will be used to establish a conceptual understanding of the derivative. We will then focus on differentiation and its applications, including related rates and curve sketching. The second part will introduce the concept of integration and the many applications of integrals, such as determining the area under or between curves and calculating volumes of solids of revolution. Differentiation and integration of transcendental functions will also be covered.

Text:
Larson, Ron, Robert Hostetler, and Bruce Edwards. *Calculus of a Single Variable*. 8th ed**.** Boston, MA: Houghton Mifflin, 2006.
*Your textbook is the property of CBGS. Please **cover** your textbook and keep it covered all year!*

Course Credit: 5 credits

Contact Information:
Office: (804) 333–1306 E-mail: mking@cbgs.k12.va.us
Cell: (804) 313–1920

Required Materials:
Students will need a notebook (or 3-ring binder), pencils, erasers, graph paper, and a graphing calculator.

Schedule of Topics Covered:

Chapter 1: Limits and Their Properties

- Limits graphically and numerically
- Evaluating limits analytically
- Continuity and one-sided limits
- Infinite limits
- Limits at infinity (Chapter 3)

Chapter 2: Differentiation

- Secants, the tangent line problem, and the derivative
- Basic rules of differentiation and rates of change
- The product and quotient rules for differentiation
- Higher order derivatives
- The chain rule
- Implicit differentiation
- Related rates

Chapter 3: Applications of Differentiation

- Extrema on open and closed intervals
- Rolle's theorem and the mean value theorem for derivatives
- Increasing and decreasing functions
- The first derivative test
- Concavity
- The second derivative test
- Curve sketching
- Optimization problems
- Newton's Method
- Differentials

Chapter 4: Integration

- Estimating area under a curve
- Riemann sums
- Definite integrals
- Antiderivatives and indefinite integrals
- The Fundamental Theorem of Calculus (I)
- The Fundamental Theorem of Calculus (II)
- Integration by substitution
- Numerical Integration

Chapter 5: Logarithmic, Exponential, and Other Transcendental Functions

- Natural logarithmic function
    - Differentiation
    - Integration

- Exponential functions
    - Differentiation
    - Integration
- Bases other than e and their applications

Chapter 7: Applications of Integration
- Determining the area between two curves
- Volume
    - Disk method
    - Shell method
- Arc length
- Area of a surface of revolution

Additional topics may be covered if time permits.

Course Information and Policies:

Assignments:
Students will be assigned homework in MathXL on a regular basis. Projects, worksheets, and problems from the textbook will also be periodically assigned.

Students should expect short **weekly quizzes** covering material learned during the previous week. There will be a **test** at the end of each chapter and at the midpoint of longer chapters. These tests will be announced in class at least one week prior to the test to ensure that you have time to prepare.

Grading:
MathXL assignments will be graded based on the student's final score upon submission. There will be many of these assignments, so it is crucial to keep up with them in order to do well in the course. Homework from the textbook will **not** be graded unless I indicate otherwise.

Assignments will be graded on a point system. Each assignment has a specific number of points available. Your grade for that assignment can be found by dividing the points received by the total points available. Tests will be worth considerably more points than other assignments.

I will regularly post grades on Blackboard.

Letter Grade:
90 – 100%: A 80 – 89%: B 70 – 79%: C 60 – 69%: D 0 – 59%: F

Make-up work policy:
If you miss a class, you are responsible for discovering what work you missed. If you are absent on the day of a test or quiz you will be required to make it up on the day that you

return to class as they are scheduled well in advance. You will not be allowed to make up tests or quizzes missed due to an unexcused absence.

Attendance:
Class attendance is required. The course attendance policy can be found in the Student Handbook. I will record absences and tardiness each class.

Academic Dishonesty:
As set forth in the student handbook, students are required to abide by the CBGS Student Honor Code. If academic dishonesty is discovered, the honor code mandates severe and specific penalties that *will* be enforced.

Cell Phones:
Students are required to **turn off** and **put away** their cell phones once class begins. Students may use their phones in class only as instructed by the teacher. Playing games, taking photos, or texting friends is never acceptable. The official CBGS cell phone policy can be found in the Student Handbook.

Emergency Evacuation Plan:
In each classroom, laboratory or other places where students are assembled for the purpose of instruction, a fire evacuation plan will be posted indicating the direction of travel from the room in the event it becomes necessary to evacuate the building as a result of fire or other emergency. This plan will be posted in a conspicuous place near the exit from the room. Whenever the fire alarm sounds, the building will be evacuated. The instructor will ensure the fire door is closed upon leaving the area (doors with automatic closures on them). Instructors are also responsible for assisting disabled students. If a classroom does not have an evacuation plan posted, the student or instructor should notify the academic dean.

CBGS Statement on Safety:
What to know and do to be prepared for emergencies at CBGS/RCC:
- Sign up to receive RCC text messaging alerts and keep your information up-to-date <https://alert.rappahannock.edu/index.php?CCheck=1>
- Know the safe evacuation route from each of your classrooms. Emergency evacuation routes are posted in campus classrooms.
- Listen for and follow instructions from CBGS/RCC or other designated authorities.
- Know where to go for additional emergency information.
- Report suspicious activities and object

Statement on Americans with Disabilities Act:
Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 require Schools to provide an 'academic adjustment' and/or a 'reasonable accommodation' to any qualified individual with a physical or mental disability who self-identifies as having such. Students should contact/ inform CBGS faculty for appropriate academic adjustments or accommodations.