Statistics (MTH 240) and Calculus II (MTH 176) 2013-2014

Mark D. King

Course Description:
In the fall semester students will be introduced to statistical methods with particular emphasis on their application to marine and environmental science. There will be a significant lab component in which students will be required to apply statistical methods to phenomenon that they might encounter in the field. Calculus II will begin with a review of the rules for differentiation and several new applications of the derivative. Students will then be introduced to the concept of integration and its many applications, such as determining the area between curves and the volume of solids of revolution. Differentiation and integration of transcendental functions will also be covered, as well as differential equations.

Text:
Bluman, Allan G. *Elementary Statistics: A Step by Step Approach: A Brief Version*.
    4th ed. Boston, MA: McGraw-Hill, 2008.
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: 6 credits (3 per semester)

Contact Information:
Office: (804) 333–1306   E-mail: mking@cbgs.k12.va.us
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Required Materials:
Students will need a notebook (or 3-ring binder), pencils, erasers, graph paper, and a graphing calculator.

Schedule of Topics Covered:

Statistics:

Unit 1 (Chapters 2 and 3):
- Course Introduction
- Distribution
- Measures of Central Tendency

Unit 2 (Chapter 5, Select Topics from Chapter 3):
- Measures of Variation
- Variance
- Standard Deviation
- Standard Error

Unit 3 (Chapter 6):
- Properties of a Normal Distribution
- The Standard Normal Distribution

Unit 4 (Chapter 7):
- Confidence Intervals

Unit 5 (Chapter 8):
- Hypothesis Testing

Unit 6 (Chapter 8):
- t-Tests

Unit 7 (Chapter 10):
- Correlation
- Regression

Unit 8 (Chapter 11):
- Analysis of Variance

Calculus II:

Chapter 2: Differentiation
- 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
- Limits at infinity
- Curve sketching
- Optimization problems
- Newton's method

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

Chapter 7: Applications of Integration
- Determining the area between two curves
- Volume
  - Disk method
  - Shell method

Additional topics may be covered if time permits.

Course Information and Policies:

Assignments:

> **Statistics:** Rather than a traditional quiz-test format, assignments in Statistics
> will consist entirely of **labs** and **projects**. Students will be expected to apply their

knowledge of statistical methods to data sets much like those they might encounter working in the field as marine and environmental scientists.

Calculus: 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. Students may also be assigned worksheets and projects periodically.

Grading:

Statistics: Labs and projects will constitute the entirety of graded assignments.

Calculus: Quizzes, tests, and projects will constitute the majority of graded assignments. Homework 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. I will regularly post grades online.

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 before class starts. Students may not use their phones as calculators. The 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.