AP Calculus AB

(MVCC Dual Credit Course MA151)
Course Syllabus and Class Expectations

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AP Calculus consists of work in Calculus and related topics comparable to courses in colleges and universities. This course is intended for students who have a thorough knowledge of analytic geometry and elementary functions in addition to college preparatory algebra, geometry, and trigonometry. The purpose of this course is to prepare the students for advanced placement in college calculus. It is expected that students who take the AP Calculus class will seek college credit and/or placement by taking the AP Calculus Examination in May.

This course is intended for students who are capable of doing college-level work in high school. Students should be motivated to learn and do well. This will be a challenging course taught at the college level that will require time and effort on the students' and teacher's parts. Completion of nightly assignments, preparation for tests and quizzes, and active participation will be necessary. Seeking extra help when necessary is also very important.

The Advanced Placement Calculus AB course follows the Advanced Placement syllabus. Students will explore graphs, functions, limits, derivatives and integrals. The main topics in the course are differentiation and integration of algebraic, exponential, and trigonometric functions.

Clinton High School is teaming with Mohawk Valley Community College to offer the opportunity to receive SUNY credit for successful completion of their course requirements. The requirements to receive credit include an appropriate placement exam result and a grade of C or above for the course. If these requirements are met, at the end of the school year the student can obtain a transcript from MVCC showing the completion of Calculus I. More information will follow about scheduling time to sit for the placement exam, if you have not taken it already.

COURSE OUTLINE: See Attached (subject to change)

THE AP CALCULUS EXAM- May 15, 2018, 8 am
About the exam:
- The exam is 3 hours and 15 minutes long.
- Section I has two parts:
    - Part A consists of 30 multiple-choice questions for which 60 minutes are allowed. The use of calculators is not permitted in Part A.
    - Part B has 15 multiple-choice questions for which 45 minutes are allowed. Some of the questions in Part B require the use of the calculator.
- Section II has two parts:
    - Part A consists of two questions and requires a graphing calculator for some questions or parts of questions. After 30 minutes, however, calculators are not permitted.
    - Part B consists of 4 questions and is allotted 60 minutes, but students are not allowed a calculator. Students may use some of this time to work further on questions in Part A.

STUDENT RESPONSIBILITIES:

The student is responsible for his/her own success in the learning process. He/she should be actively involved in the learning process and should behave appropriately for a learning environment.

- The student is responsible for attending class every day. In the event that you are absent, any handouts given in your absence will be located in a folder near the door.
- The student is responsible for arriving to class on time.
- The student is responsible for remaining quiet and on task during class time so as not to disrupt the learning of other students. (This includes NOT using your cell phone for any reason, other than when instructed by the teacher.)
- The student is responsible for bringing to class all necessary materials (handouts, paper, pencil, calculator, etc.)
- The student is responsible for completing all assignments, including quizzes and tests.
- The student is responsible for participating in all class discussions and question-and-answer sessions.
- The student is responsible for arranging to take make-up quizzes and tests in a timely manner.

CLASSROOM RULES
1. **Be Polite**
2. **Be Prepared**
3. **Be Prompt**
4. **Be Positive**
5. **Be Productive (Try first, then ask questions)**

MATERIALS:
- The textbook: *Calculus of a Single Variable – Larson, Hostetler and Edwards.* In general, the textbook will not be needed in class and may remain at home. Copies of the text will be available for use during class and after school.
- 3-ring binder for notes and handouts
- Loose-leaf filler paper.
- **PENCIL** and good eraser
- Graphing calculator – As mandated by The College Board, graphing calculators will be required for this course. Owning a TI-84 Plus or better will be an asset to you. If you do not own a calculator you may make arrangements to use a classroom calculator during lunch or study hall in my classroom. You will still be responsible for homework requiring a calculator.
- SUGGESTED STUDY GUIDES FOR THE AP EXAM:
  - Barron's AP Calculus
  - 5 Steps to a 5: AP Calculus AB/BC (McGraw Hill)
  - Princeton Review

GRADING POLICY
You will receive points for tests, quizzes, homework, and classwork. When quarter grades are calculated your total points earned will be divided by total possible points.

Daily homework will be checked regularly, either by collecting or on-the-spot quiz taken directly from the homework. Any classwork packets assigned will be collected and graded for accuracy.

The 2nd quarter will include the midterm examination grade, which will be counted as 1/3 of the 2nd quarter grade. The final grade for the class (in June) will consist of the average of 5 parts – the four (4) quarter grades plus the final examination grade. There will be a final exam in this course, in addition to the AP examination. The final will be administered in June.

REMIND

I am asking all students to sign up to my Remind account. This will give me the ability to send you messages via your cell phone. This is a one-sided correspondence and you will not be able to reply to any message I send. This will be used to give updates to any assignments or special messages, for example, if I decide to postpone a quiz/test. I will be handing out instructions on how to sign up during class. Your parents will also be able to sign up to receive these same messages.

ADDITIONAL HELP AND GUIDANCE

It is your responsibility to make sure that you understand the assigned homework problems. That means seeking out other classmates, the instructor, or others as needed. Because new material generally builds off previous topics, *do not wait until it is too late to seek help.*

If you need or want extra help, you are encouraged to make arrangements to meet with me. I am available during planning periods (periods 2, 3 or 9) and after school. Please let me know ahead of time so that I will expect you. If you are coming from a study hall, you are required to get a pre-signed pass from me so your study hall teacher knows I will be waiting for you.

COURSE OUTLINE

I. Algebra Review
   a. Distance
   b. Slope
   c. Equations of Lines and Circles
   d. Absolute Value Equations and Inequalities
   e. Function Notation
   f. Composite Functions

II. Limits
   a. Definition
   b. Properties
   c. Continuity

III. Derivatives
   a. Difference Quotient
   b. Proof of Power Formula
   c. Properties of Derivatives
   d. Product and Quotient Rules
   e. Chain Rule
   f. L'Hopital's Rule
   g. Higher Order Derivatives
   h. Implicit Differentiation
   i. Derivatives: Trigonometric, Exponential, and Logarithmic Functions

IV. Applications of Derivatives
   a. Related Rates
   b. Maxima/Minima Problems
   c. Rolle's Theorem/ Mean Value Theorem
   d. Increasing/Decreasing Functions
   e. Curve Sketching
   f. Optimization

V. Integration
   a. Indefinite Integral
   b. Area Under a Curve
   c. Definite Integrals
   d. Area Under a Curve
   e. Fundamental Theorem of Integral Calculus
   f. Integration by Substitution
   g. Transcendental functions
      1. Logarithmic/exponential
      2. Trigonometric/inverse trigonometric
   h. Numerical Integration
      1. Riemann Sums
      2. Trapezoidal Rule
      3. Simpson's Rule

VI. Applications of the Definite Integral
   a. Area Between Two Curves
   b. Volumes
      1. Disk Method
      2. Washer Method
      3. Shell Method
   c. Differential Equations
      1. Slope Fields
      2. Growth and Decay Models
      3. Separation of Variables
      4. First-order Linear