AP Calculus AB

Mr. Solis

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*“The difference between a successful person and others is not a lack of strength, not a lack of knowledge,*

*but rather a lack of will.”*

*Vince Lombardi*

***CLASS GOALS:*** *All students will score a 3 or higher on the class’ final exam in May.*

**COURSE DESCRIPTION:**

This yearlong course is equivalent to a one-semester college course in Calculus. Students will explore the following topics: functions and their graphs, limits and continuity, the derivative and its applications, definite and indefinite integrals, and logarithmic, exponential, and trigonometric functions. The course is intended for students who have a thorough knowledge of algebra, geometry, trigonometry, and analytic geometry, and who both enjoy and seek a challenge that will help them grow as mathematical thinkers. The graphing calculator will be used extensively to help students gain an insight into the principles of calculus and the relationships among the graphical, algebraic and numerical representations of concepts.

**COURSE OUTLINE:**

This course will consist of six main units in which students will continuously build on prior knowledge to investigate an essential unit question. Each unit will conclude with a summative test that is designed to reflect the rigor and expectations of a college-level course. Units include:

0. **Functions** - How do transformations on parent graphs compare to one another and how can one rewrite an absolute value function as a piecewise function?

1. **Limits and Continuity** - How can one evaluate limits algebraically, numerically and graphically? How can continuity be expressed in terms of limits and how can asymptotes help us better understand limits to infinity?

2. **Derivatives** - What is the definition of a derivative in terms of limits? How are a graph’s tangent line at a point and its derivative related and what is the relationship between differentiability and continuity of a function?

3. **Applications of Derivatives** - What does the graph of a function’s derivative represent? Can we construct a graph of a function when given the graph of its derivative and one solution? What is optimization in terms of a graph’s absolute and local extrema?

4. **Integrals** - What can integration help me calculate in a function’s graph? How are derivatives and integrals related?

5. **Applications of Integrals** - What is the difference between Average Value Function and the Average Rate of Change?

What is implied by “rate of change” when describing a graph? What is implied by “average” when describing a graph?

6. **Differential Equations** - How can one apply derivative and integration rules to separable differential equations?

How are slope fields and solution curves for differentiable equations related?

**THE AP EXAM:**

The 2017 AP Calculus AB exam is scheduled for **Tuesday, May 9th**! A countdown can be found on our class’ website!

The AP Calculus AB exam will be about three hours long and is broken up into four sections that cover the previously listed unit topics.

**2 multiple-choice sections (both with and without a calculator)**

**2 free-response questions (both with and without a calculator)**

Saturday tutoring will be available staring in **January 2017** and we will take our first full-length practice exam in ***December 2016***!

**COURSE TEXTS:**

Major course practices and homework will be drawn from the following sources:

* Finney, Ross L., Franklin Demana, Bert Waits, and Daniel Kennedy. Calculus: Graphical, Numerical, Algebraic,

3rd ed. Addison-Wesley Longman, 2007.

* Larson, Ron, Edwards, Bruce. Calculus of a Single Variable, 10th ed. Brooks/Cole, 2014.

**INSTRUCTIONAL GOALS AND ROUTINES: *tajimasolis.weebly.com***

Most all of our resources can be found on our class website. We will work extensively with graphing calculators and our assessments will be designed so that students become proficient with and without the device. Each lesson is designed to allow us to practice new skills and conceptually understand the reasoning behind them. Each lesson cycle will follow the pattern below

LAUNCH 🡪 EXPLORE 🡪 SUMMARIZE 🡪 SHARE

**HOMEWORK:**

Review Homework will be assigned **every Friday** and checked after the weekend. Its purpose is to provide consistent practice and preparation for our unit assessments AND the AP test in May.

**REQUIRED MATERIALS:**

Every day, students must have

1. A pocket folder
2. Two spiral notebooks
   1. Notes
   2. Practice
3. Writing utensil (pencil is preferred)

**CLASSROOM EXPECTATIONS:**

1. **Follow teacher and staff directions at all times.**
2. **Be on time, on-task, in dress code, and prepared to learn EVERY DAY.**
3. **Respect our classroom**: No vandalism, tagging, or destruction of school property.
4. **Use appropriate language**: No cursing, teasing, or bullying.
5. **Focus on learning**: No food, drinks, or electronics.
6. **Respect others’ workspace and belongings**: Keep hands, feet and objects to yourself.