AP Calculus AB Syllabus 2011-2012

You have brains in your head. You have feet in your shoes. You can steer yourself, any direction you choose. ~ Dr. Seuss ~

TEXTBOOK:

* **Calculus of a Single Variable: Eighth Edition c 2006**
  + Larson, Hostetler, Edwards

Supplemental Book

* **Cracking the AP Calculus AB & BC Exams, 2010 Edition**
  + David S. Kahn

COURSE OBJECTIVES/GOALS

This year long course is intended to help students develop an understanding of the concepts of calculus, including but not limited to, limits, differentiation, integration, and approximation. The course will expose the students to a variety of applications and modeling of calculus concepts. Students will learn to analytically support data, read and understand mathematical text, communicate mathematics effectively, both in a written and oral format, and use technology to support conclusions.

INSTRUCTION

Students will be instructed on a daily basis using a variety of instructional methods. Notes will be provided by the instructor consistently throughout the course and students will have opportunity to collaborate with each other during class, as well as with the instructor. Graphing calculators will be used to demonstrate concepts and students will have access to graphing utilities during class. Supplemental instructional material will also be available and utilized when appropriate.

COURSE DESIGN/PHILOSOPHY

The intent for this course is for each student to gain an appreciation and respect for the applications and importance of calculus. The goal is for each student to know both how to solve a problem as well as the reason for doing the problem. When students know and understand the relevance, they can grasp and apply the concept more readily. The course outline following shows the sequential order and the topics that will be covered in the course.

Chapter P – Preparation for Calculus

* Graphs & Models Linear Models and Rates of Changes
* Functions and Their Graphs Fitting Models to Data

Chapter One – Limits and Their Properties

* A Preview of Calculus Finding Limits Graphically and Numerically
* Evaluating Limits Analytically, Continuity, and One-Sided Limits
* Infinite Limits

Chapter Two – Differentiation

* The Derivative and the Tangent Line Problem
* Basic Differentiation Rules and Rates of Change
* Product Rule Quotient Rules
* Higher-Order Derivatives Chain Rule
* Implicit Differentiations Related Rates

Chapter Three – Applications of Differentiation

* Extrema on an interval, Rolle’s Theorem and the Mean Value Theorem
* Increasing and Decreasing Functions, First Derivative Test / Second Derivative Test
* Concavity Limits at Infinity
* Optimization Differentials

Chapter Four – Integration

* Anti-derivatives Indefinite integration
* Area Riemann Sums
* Definite Integration Fundamental Theorem of Calculus
* Integration by Substitution Numerical Integration

Chapter Five – Logarithmic, Exponential and Other Transcendental Functions

* Differentiation of Natural Logarithmic Functions, Integration of Natural Logarithmic Functions
* Inverse Functions Differentiation of Exponential Functions
* Integration of Exponential Functions Bases other than e
* Differentiation of Inverse Trigonometric Functions, Integration of Inverse Trigonometric Functions

Chapter Six – Differential Equations

* Slope Fields Growth and Decay
* Separation of Variables

Chapter Seven – Applications of Integration

* Area of a Region Between Two Curves Volume, Disk & Shell Method

Materials for Class

All students are expected to have the following with them in class each day:

* Textbook
* Pencil/eraser
* 3-ring binder
* Calculator (preferably a TI-83 or TI-84)
* Attitude ready to learn

Grades

Students will be graded as follows:

* Homework, which will be given daily and will constitute approximately 15% of the grade
* Quizzes, which will be given after each subunit and will constitute approximately 35% of the grade
* Tests, which will be given at the end of each unit and will constitute approximately 35% of the grade
* In class assignments, which will be given randomly and will constitute approximately 15% of the grade

Other Useful Information

All students in this class should have successfully completed the pre-requisite courses needed to be successful in calculus as outlined on the college board website ([www.collegeboard.com](http://www.collegeboard.com)). Additionally, students should expect to have a demanding calculus work load, both inside and outside of class. Students will be required to do independent reading and research throughout the course and communicate their findings in formats of choice. It is imperative that students recognize the difference between collaborative work and individual work. Academic honesty is crucial and any unethical behavior will not be tolerated. Regular class attendance is extremely important for success. Any student who is absent from class will be responsible for all missed work. All grades will be updated weekly and parents are encouraged to contact me at anytime regarding student’s progress.

I am extremely excited to work with you this school year! I absolutely love calculus and I’m honored to be able to teach it to you and show you the beauty of mathematics! Please know my door is always open should you have a concern. Let’s make it a great year!