D. Perez
2011-2012

AP Calculus AB

Course Overview:
This course will cover all the topics included in the *Calculus AB Course Description* as it appears on the AP Central website. The main objectives of this class are to prepare students for the Advanced Placement exam and for subsequent college courses in mathematics.

Text:
Larson, Hostetler and Edwards *Calculus: Early Transcendental Functions*: 4th Edition. Houghton Mifflin College Publishing, 2007.
Student Companion Site:
http://college.cengage.com/mathematics/larson/calculus_early/4e/instructor_home.html

Course Planner:

1st SEMESTER AP Calculus AB

Section	Topic	Timeline (approx.)
Preparation for Calculus		
1.1	Graphs and Models	
1.2	Linear Models and Rates of Change	
1.3	Functions and Their Graphs	2.5 weeks
1.4	Fitting Models to Data	
1.5	Inverse Functions	
1.6	Exponential and Logarithmic Functions	
Limits and Their Properties		
2.1	A Preview of Calculus	
2.2	Finding Limits Graphically and Numerically	
2.3	Evaluating Limits Analytically	2 weeks
2.4	Continuity and One-Sided Limits	
2.5	Infinite Limits	
Differentiation		
3.1	The Derivative and the Tangent Line Problem	
3.2	Basic Differentiation Rules and Rates of Change	
3.3	The Product and Quotient Rules and Higher-Order Derivatives	
3.4	The Chain Rule	4 weeks
3.5	Implicit Differentiation	
3.6	Derivatives of Inverse Functions	
3.7	Related Rates	
Applications of Differentiation		
4.1	Extrema on an Interval	
4.2	Rolle's Theorem and the Mean Value Theorem	
4.3	Increasing and Decreasing Functions and the First Derivative Test	
4.4	Concavity and the Second Derivative Test	
4.5	Limits at Infinity	
4.6	A Summary of Curve Sketching	4 weeks
4.7	Optimization Problems	
4.8	Differentials	

Integration		
5.1	Antiderivatives and Indefinite Integration	
5.2	Area	
5.3	Riemann Sums and Definite Integrals	
5.4	The Fundamental Theorem of Calculus	4 weeks
5.5	Integration by Substitution	
5.6	Numerical Integration	
5.7	The Natural Logarithmic Function: Integration	
5.8	Inverse Trigonometric Functions: Integration	
Review for Final		1 week

2nd Semester AP Calculus AB

Differential Equations		
6.1	Slope Fields and Euler's Method	
6.2	Differential Equations: Growth and Decay	2 weeks
6.3	Differential Equations: Separation of Variables	
Applications of Integration		
7.1	Area of a Region Between Two Curves	
7.2	Volume: The Disk Method	2 weeks
7.3	Volume: The Shell Method	
Integration Techniques, L'Hôpital's Rule, and Improper Integrals		
8.1	Basic Integration Rules	
8.2	Integration By Parts	
8.3	Trigonometric Integrals	
8.4	Trigonometric Substitution	3 weeks
8.5	Partial Fractions	
8.6	Integration by Tables and Other Integration Techniques	
8.7	Indeterminate Forms of L'Hôpital's Rule	
Preparation for AP Exam (May 6, 2009)		3-4 weeks
Preparation for Final Exam		4 weeks

Teaching Strategy:
Class will usually begin with a warm-up on the previous days' material and corrected as a class to reinforce the material. Lessons will be presented on the board along with handouts (extra notes written in friendly terms and step-by-step solutions to problems similar to homework problems). Problems will be presented and solved in four distinct ways: analytically, numerically, graphically, and verbally. As a class, students respond to questions asked by the instructor to help make connections between different material. Students also pick problems from the textbook to have solved and explained on the board. Students will be asked to explain calculus problems and techniques verbally and in writing. Students will work on assignments that require analytical, numerical, graphical, and verbal skills. Homework will be given daily and practice tests before exams. Students will work collaboratively in groups on homework and practice tests and present solutions on the board.

Technology:
Students will be provided with a TI-84+ graphing calculator to use throughout the year. Calculators will be checked out and can be taken out of the class and use as needed. Instructor will use the TI-84+ graphing

calculator to do presentations. Training on all aspects of the calculator will be part of the curriculum. When graphing techniques are presented, students are given step-by-step instructions and work through the problems together. Students will be taught how to use the calculator to help solve problems, experiment, interpret results, and support conclusions. The graphing calculator will be needed for presentations, classwork, homework, and on some but not all tests, and is a requirement for parts of the Advanced Placement exam.

Parents and Students are recommended to check students' progress and the most updated class information throughout the semester via internet by visiting my website at www.thepowerofmath.com . Grades are updated many times a week and should be checked often.

Grading Policy

Assignments (i.e. homework, *projects)	12%
Participation (attendance and cooperation; including *warm-ups)	10 %
Tests/Quizzes	61 %
Final	17%

The Final Grade for the semester will be on a standard percentage scale.
A: 100%-90%; B: 89%-80%; C: 79%-70%; D: 69%-60%; F: 59% or below

**may or may not be assigned*

Homework is assigned homework every day and is due the next school day at the beginning of class (before the bell). Each homework assignment is worth 5 points and graded on percent completed (20% = 1 pt.; 40% = 2 pts. ; 60% = 3 pts. ; 80% = 4 pts. ; 100% = 5 pts.) with proper work shown. Note: homework may be worth more points when given as review

Project(s) may be assigned throughout the semester. A student portfolio that includes a collection of all the work related to this class including notes will be due at the end of the semester.

Participation points are earned on a daily basis by attending, participating, cooperating in class and arriving on time. (This includes warm-ups.) Students will receive 5 points for each day of participation. Students will also receive participation points for getting their graded tests signed by a parent or guardian and turned in within one week from the day the graded tests are returned to them.

Tests will be given with at least with one day notice (see semester plan online). Tests will always be similar to the homework problems assigned. The number of possible points of a test may vary.

Quizzes can be given at any time. The number of possible points of a quiz may vary.

Extra Credit can be offered at any time. Extra credit can be offered as a bonus problem on a test or as student participation on the board (where a student completes a problem on the board and explains it to the class for two points extra credit) or answering a question that no other student can answer. Extra credit points are always one to two points.

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Make-up work: Only assignments that are missed due to an excused absence will be accepted late.

- If a *test/quiz* is missed due to an excused absence the student must notify the teacher immediately upon their return otherwise 0 (zero) credit will be given. A maximum of two exams can be made up
- due to excused absences. There are no make-ups for pop-quizzes, but may be excused (see teacher)
- *Homework assignments* can be made up if it they are missed due to an excused absence and will be due on the second day of the students return but homework that was due the day of the absence will be due the on their first day back to class.

A **cumulative final** will be given.

I reserve the right to change the class policy to suit the best interest of the students.