

NOUVEL CATHOLIC CENTRAL HIGH SCHOOL

AP CALCULUS AB

COURSE SYLLABUS

COURSE DESCRIPTION:	<p>AP Calculus consists of a full high school academic year of work that is comparable to a Calculus I course at the collegiate level. The AP Calculus course is an extremely rigorous class that calls on the skills and information acquired from previous math courses to perform limits, derivatives, anti-derivatives, integrals and differentials with major emphasis on applications. The course emphasizes a multi-representational approach to calculus, with concepts, results, and problems being expressed geometrically, numerically, analytically, and verbally. It is expected that students who take AP Calculus will seek college credit through the AP Calculus exam given by the College Board each spring.</p> <p>Grades offered: 11 and 12</p> <p>Prerequisite: “B” average or higher in Honors Pre-Calculus or “A-” or higher in Regular Pre-Calculus</p>
MAJOR COURSE GOALS:	<p>The goal is to provide students with the critical thinking skills and mathematical know-how needed to succeed in college or any endeavor. The goal includes graphing technology skills. Student’s goal is to develop an in depth understanding of calculus that they can apply to college calculus courses and the AP Calculus exam. Topics covered include:</p> <ul style="list-style-type: none">I. Pre-calculus Review<ul style="list-style-type: none">a. Functions and Graphsb. Exponential Functionsc. Parametric Functionsd. Logarithm Functionse. Trigonometric FunctionsII. Limits and Continuity<ul style="list-style-type: none">a. Rates of Change and Limitsb. Limits Involving Infinityc. Continuityd. Rate of Change and Tangent LinesIII. Derivatives<ul style="list-style-type: none">a. Derivative of a Functionb. Differentiabilityc. Rules for Differentiationd. Velocity and Other Rates of Changee. Derivatives of Trigonometric Functionsf. Chain Ruleg. Implicit Differentiationh. Derivatives of Inverse Trigonometric Functionsi. Derivatives of Exponential and Logarithmic Functions

	<p>IV. Applications of Derivatives</p> <ol style="list-style-type: none"> a. Extreme Values b. Mean Value Theorem c. Connecting derivatives to function graphs d. Modeling and Optimization e. Linearization and Newton's Method f. Related Rates <p>V. Integrals</p> <ol style="list-style-type: none"> a. Estimating with Finite Sums b. Definite Integrals c. Definite Integrals and Antiderivatives d. Fundamental Theorem of Calculus e. Trapezoidal Rule <p>VI. Differential Equations, Math Modeling, Integral Applications</p> <ol style="list-style-type: none"> a. Slope Fields and Euler's Method b. Antidifferentiation by Substitution c. Exponential Growth and Decay d. Integral as Net Change e. Areas in Planes f. Volumes of Solids
<p>COURSE ASSESSMENT PLAN:</p>	<p>The student will demonstrate their attainment of the course goals through a variety of assessments. Each chapter will have at least one summative assessment (chapter test). Chapter assessments will include show-your-work problems and short answer conceptual questions. Frequent formative assessments such as quizzes, homework problems, in class activities, will be used throughout the course to measure student progress towards the course goals.</p> <p>Course grades will be calculated on a percentage basis as follows:</p> <p>80% Assessments (chapter tests, quizzes and other assessments)</p> <p>20% Assignments (problem sets, lesson reflections, class activities, etc...).</p> <p>A comprehensive exam will be given at the end of each semester. Semester exams will count as 20% of the semester grade.</p>
<p>RECOMMENDED SUPPLIES AND MATERIALS:</p>	<ul style="list-style-type: none"> • 3-ring binder with dividers OR spiral notebook and folder combination • Lined paper and graph paper • Post-it Notes • Pencils and erasers (ink is not allowed) • Graphing or scientific calculator (TI-83, TI-84 or TI-34)

	Textbook: Finney, Demana, Waits and Kennedy. <i>Calculus—Graphical, Numerical, Algebraic</i> . Third edition. Pearson, Prentice Hall, 2007.
EXTRA HELP:	Before and after school extra help can be arranged by appointment. Students are encouraged to come in for extra help as soon as the need arises. All make-up tests and quizzes must take place before or after school. Students are also encouraged to email the teacher or post questions to the online learning platform at any time for assistance
INSTRUCTIONAL PHILOSOPHY:	<p>Student participation is at the core of every teaching strategy used in the course. This course utilizes lecture, video lessons, discussion, demonstration, and student centered investigations. In doing so, the purpose is to maximize learning by branching across many learning and teaching styles and therefore helping all students gain a deeper understanding of mathematics.</p> <p>Learning is a two sided relationship where both the student and the teacher need to put forth their best effort. Communication is key. Students will be asked to reflect upon and communicate on the progress of their learning on a regular basis.</p>
INSTRUCTIONAL ACTIVITIES AND COURSE PROJECTS:	<p>There will be a combination of individual, group and partner work in this class to challenge all students towards their absolute potential. AP Calculus is a rigorous course that requires students to think deeply and will be expected to be able to explain Calculus concepts both algebraically and in written responses to clearly communicate knowledge.</p> <p>A whole understanding of mathematics is key to success in AP Calculus and is beneficial for success on the AP Calculus exam. Throughout the course, students will be asked to express knowledge of material, both written and verbally, through questions during instruction, group work, and especially during quizzes and tests. Simply knowing the answer is not enough.</p> <p>Within the presentation of a lesson, the learner will have time each class time to try out assigned problems and ask questions if necessary. Students who use their time wisely will be able to finish many of the assigned problems in class.</p> <p>The learner will also participate in projects and class investigations in order to achieve the most out of his/her learning experience. A graphing calculator will be utilized throughout the course to help students identify characteristics of functions, identify and determine mathematics concepts relating to the graphs of functions (derivatives, integrals, rate of change, etc.) as well as investigating calculus concepts to develop a deeper understanding of calculus and other mathematics concepts. Students should expect to become “experts” in utilizing a graphing calculator to: enhance their understanding of concepts, support conclusions determined algebraically or graphically, interpret results and make conclusions from the data, as well as using calculators to experiment and explore calculus concepts.</p>

CLASSROOM EXPECTATIONS:	<p>The student is expected to...</p> <ul style="list-style-type: none"> • Be fully prepared for class and in their seats when the bell rings. • Participate fully in all class activities. • Show respect toward each other, the teacher, and school property at all times. • Take responsibility for their performance by asking questions and seeking additional help when needed. • Refrain from using any personal electronic device in the classroom unless directed by the teacher. • Be familiar with and adhere to all policies outlined in the Student Handbook
HOMEWORK POLICY AND GRADING SCALE:	<p>Practice is essential to success in Calculus. Each problem is different. The more exposure to calculus problems, the better you get at solving them. Homework practice problems or online tutorials are assigned almost every day and must be completed by stated deadlines. Incomplete assignments are not accepted. Every problem assigned should be attempted and all work must be shown. Homework will be graded by a combination of completeness and correctness. Course letter grades are determined by the grading scale listed in the Student Handbook.</p>
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