

NOUVEL CATHOLIC CENTRAL HIGH SCHOOL

AP PHYSICS C: Advanced Mechanics

COURSE SYLLABUS

COURSE DESCRIPTION:	AP Physics C: Advanced Mechanics is a course following the college board curriculum for AP Physics C Mechanics. The course is equivalent to one semester of university calculus based physics. The course covers mechanics in full detail, has a strong laboratory component, and emphasizes student problem solving strategies. Introductory differential and integral calculus is used throughout the course. Because the course involves elements of blended learning, students should possess the ability to work independently, think critically and communicate effectively both online and in the classroom. Pre-requisite includes Honors Physics or teacher recommendation. Co-Requisite includes Calculus.
MAJOR COURSE LEARNING OBJECTIVES:	<p>Each student will be provided with a copy of the most current AP Physics learning objectives from the college board. The objectives elaborate on the following content outline for the course:</p> <p>Unit 1: Kinematics</p> <p>Measurement · Motion in a Straight Line · Motion Graph Analysis · Free Fall Motion · Scalars and Vectors · Motion in Two and Three Dimensions · Projectile Motion · Uniform Circular Motion</p> <p>Unit 2: Newton's Laws of Motion</p> <p>Force and Mass · Static Equilibrium · Tension and Normal Force · Friction · Drag Force and Terminal Speed · Centripetal Force · Force Vector Diagrams</p> <p>Unit 3: Work, Energy, Power</p> <p>Kinetic Energy · Work · Work-Energy Theorem · Power · Potential Energy · Conservation of Energy</p> <p>Unit 4: Center of Mass and Linear Momentum</p> <p>Center of Mass · Linear Momentum · Impulse · Conservation of Momentum · Inelastic and Elastic Collisions in 1-D · 2-D Collisions</p> <p>Unit 5: Rotation</p> <p>Angular Motion Kinematics · Rotational Inertia · Rotational Kinetic Energy · Torque and Rotational Statics · Work and Rotational Energy · Rolling Motion · Angular Momentum and its Conservation</p>

	<p>Unit 6: Oscillations</p> <p>Dynamics and Energy of Simple Harmonic Motion · Spring-Mass Systems · Pendulums · Simple Harmonic Motion and Circular Motion · Damping and Resonance</p> <p>Unit 7: Gravitation</p> <p>Newton’s Law of Gravitation · Gravitation Potential Energy · Kepler’s Laws · Planet Motion · Satellites</p>
COURSE ASSESSMENT PLAN:	<p>The student will demonstrate their attainment of course goals through a variety of assessments. Each unit will have one formative assessment in the AP format with a multiple choice section and a free response section. Student comprehension will also be assessed through laboratory write-ups, written reflections, and problem sets. Quarter scores will be calculated on a percentage basis.</p> <p>70% Assessments (tests, quizzes, written assessments, projects)</p> <p>20% Laboratory Investigations</p> <p>10% Problem Sets</p> <p>A comprehensive semester exam will be given at the end of each semester. Semester grades will be calculated according to the student handbook.</p>
SUPPLIES AND MATERIALS NEEDED:	<ul style="list-style-type: none"> • Textbook: <i>Fundamentals of Physics</i> by Halliday, Resnick, Walker 7th edition • Binder with sections for notes, labs, reflections and problem sets • Graphing Calculator, loose leaf paper, graph paper, pencils
EXTRA HELP:	<p>Extra help is offered before school, after school, and during lunch hours. Students are encouraged to come in for extra help as soon as the need arises. All make-up tests, quizzes and labs must take place before or after school. Students are also encouraged to email the teacher or post questions to the online learning platform at anytime for assistance.</p>
INSTRUCTIONAL PHILOSOPHY:	<p>AP Physics is a student-centered learning environment. Students will be primarily build their own knowledge of the subject through readings, online tutorials, and laboratory investigations. The instructor will also facilitate in-class discussions and demonstrations to aid in student understanding of the concepts. Students will be required to both independently and collectively to solve complicated problems on a regular basis.</p>
INSTRUCTIONAL ACTIVITIES:	<p>A variety of learning styles will be met through instructional activities such as interactive lectures, demonstrations, computer simulations, online lessons, small group problem solving and hands-on laboratory investigations. Most labs in the course are designed to</p>

	<p>present students with a problem to be solved or an important concept to verify. Students will conduct labs in a small group setting using Vernier Lab Quest data collections devices and probes as well as standard lab instruments. Some labs will come from the Vernier Advanced Mechanics Laboratory Manual. Other labs will be designed by the students. Students will hypothesize, develop a plan for investigation, collect and organize data, analyze data, draw conclusions, and discuss error.</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. • Work only on physics assignments during independent work days. • Show respect toward each other and the teacher both online and in the classroom. • Take responsibility for their performance by asking questions and seeking additional help when needed. • Demonstrate an advanced placement level attitude with a desire to truly understand the material and a willingness to be challenged. • Use personal electronic devices only when given direct permission and only for the intended purpose.
HOMEWORK POLICY AND GRADING SCALE:	<p>All work is expected to be turned in on time and be of high quality. In alignment with science departmental policy, assignments may be accepted a maximum of one day late for a maximum of half credit. Letter grades are determined by the grading scale listed in the student handbook.</p>
CONTACT INFO:	
Teacher:	Lisa Moore
Email Address:	lmoore@sacschools.org
Phone Number:	989-399-2442

AP Physics Syllabus Statement of Understanding:

- I have read the **Advanced Placement Physics** course syllabus and understand the expectations of the class.
- I understand that it is the student's responsibility to determine and complete work missed due to an absence.
- I understand that the student is to bring all necessary books and materials to class each class period.
- I understand that the student will be marked tardy if they are not in their assigned seat when the bell rings.
- I understand that cell phones and other personal electronic devices will be taken up if used without direct permission or for unintended purposes.

Student Signature: _____ Date _____

Parent Signature: _____ Date _____