

NOUVEL CATHOLIC CENTRAL HIGH SCHOOL

HONORS PHYSICS

COURSE SYLLABUS

COURSE DESCRIPTION:	Honors Physics is a one year, advanced-level science course for 11 th and 12 th graders with strong backgrounds in mathematics and science. The course aims to prepare students for post-secondary study in fields such as engineering and medicine. Due to the blended learning nature of this course, students should possess the ability to work independently, think critically and communicate effectively both online and in the classroom. Students should have successfully completed Honors Algebra I and Honors Geometry. The course is open to advanced sophomores who have met the pre-requisites with teacher permission.
MAJOR COURSE GOALS:	<ol style="list-style-type: none">I. The learner will deepen their understanding of the nature of science and demonstrate an ability to practice scientific reasoning by applying it to the design, execution, and evaluation of scientific investigations.II. The learner will become proficient at explaining their observations of the physical world in both qualitative and quantitative ways.III. The learner will measure, calculate, graph and analyze the motion of objects in linear, angular, and projectile motion.IV. The learner will apply Newton's Laws to predict and calculate the change in the motion of an object when acted on by forces.V. The learner will describe how force, mass and velocity affect the momentum, calculate impulse, and solve collision problems.VI. The learner will identify and explain forms of energy in mechanical systems and measure and calculate work and changes in kinetic and potential energy.VII. The learner will explain the property of mechanical waves, predicting and calculating their behavior.VIII. The learner will explain the nature of light and predict how it interacts with matter.IX. The learner will explain the properties of electromagnetic waves, predicting their interaction with various media, and explain the relationships electromagnetic waves, communication, and quantum theory.X. The learner will explain how objects become electrically charged and describe how electric force varies between them.

	<p>XI. The learner will identify types of electric circuits, describe and calculate the relationships in current electricity, and explain everyday applications of electric current.</p> <p>XII. The learner will explain transformations from one form of energy to another and calculate thermal energy transfer.</p>
<p>COURSE ASSESSMENT PLAN:</p>	<p>In order to meet the course goals, the content is divided up into approximately 10 units. A formal assessment measuring student mastery of the material will be given at the end of each unit. Some unit assessments will be traditional tests with short answer, multiple choice, and word problems involving calculations. Other unit assessments will be portfolio based involving the use of web 2.0 tools. Frequent in class and online formative assessments will be used in order for the teacher and student to monitor progress. Honors students will be expected to not only demonstrate understanding but also apply understanding to new problems. A comprehensive exam will be given at the end of each semester.</p> <p>Grades are calculated on a percentage basis based on the following categories:</p> <p>60% Assessments (quizzes, tests, projects)</p> <p>20% Laboratory Investigations</p> <p>20% Assignments (problem sets, class activities, reading reflections, etc...)</p>
<p>SUPPLIES AND MATERIALS NEEDED:</p>	<ul style="list-style-type: none"> • 1” or 1.5” binder OR notebook/folder combination (for papers and notes) • scientific calculator (with trig functions) • loose leaf paper and pencils (ink is not allowed on turned-in work) • graph paper
<p>EXTRA HELP:</p>	<p>Before and after school 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, 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>

<p>INSTRUCTIONAL PHILOSOPHY:</p>	<p>Students will be learning in both an online and face-to-face settings. Participation by the student is at the core of every teaching strategy used in the course. The student will discover main ideas through small group laboratory investigations and online simulation activities. Teacher led demonstrations in class and interactive lessons online will solidify concepts. The student regularly reflect on their learning through discussion with other students in class and online. The student will become a successful independent, scientifically-minded problem solver through the modeling of the teacher and the interaction with other students in the class. At the honors level, material is covered with more depth and at a quicker pace than the non-honors level.</p>
<p>MAJOR COURSE PROJECTS AND INSTRUCTIONAL ACTIVITIES:</p>	<p>A variety of learning styles will be met through instructional activities such as interactive lectures, demonstrations, hands-on laboratory investigations, virtual labs, computer simulations, online videos and small group problem solving. Honors level problems sets require a pre-requisite of extensive algebra and geometry skills.</p> <p>Major Course Projects may include:</p> <ul style="list-style-type: none"> • Kinematics/Dynamics Project: The student will formulate a question pertaining to the application of kinematics/dynamics to an area of personal interest. They will use multiple resources to investigate an answer to their question. • Sound and Waves Blended Learning Unit: Through planned face-to-face and online experiences, students will build knowledge and create evidence of that knowledge in the format of their choice. • Light and Optics Blended Learning Unit: Through planned face-to-face and online experiences, students will build knowledge and create evidence of that knowledge in the format of their choice. • Misconceptions Paper: At the end of the year, students will write a paper describing the physics misconceptions that they held at the beginning of the course but have since come to realize were incorrect
<p>CLASSROOM EXPECTATIONS:</p>	<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 proper online etiquette and follow all copyright rules and fair use guidelines.

	<ul style="list-style-type: none"> • Show respect toward each other, the teacher and school property both online and in the classroom. • Refrain from using any personal electronic device in the classroom unless directed by teacher. • Take responsibility for their performance by asking questions and seeking additional help when needed. • Be familiar with and adhere to all policies outlined in the Student Handbook. • Demonstrate an honors level attitude with a desire to truly understand the material and a willingness to be challenged.
HOMEWORK POLICY AND GRADING SCALE:	All assignments are expected to be submitted on time and be of high quality. In alignment with science departmental policy, homework 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.
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