Iona Prep
Course Syllabus

Physics Honors
2019-2020

Instructor: Br. R.W. Harris
Email: Br.Harris@ionaprep.org
Phone: 914-632-0714 x278

Extra Help Schedule: 3:05-3:45 pm; by appointment

Course description: In this Honors Physics class, we will investigate the physical laws of nature, matter and energy. The focus will be on developing an understanding of the qualitative and quantitative aspects of physics. Throughout this course, emphasis will be placed on observation, interpretation, and reasoning. We will use these to model physical interactions using algebra, geometry, and trigonometry. This is a lab-based course, and many of the objectives are aligned with the New York State Physical Settings / Physics Core Curriculum.

LEARNING GOALS

After a successful completion of this course, a student will be able to:

- Understand how to complete and report a laboratory investigation
- Analyze experimental data, noting trends and comparing with expected results
- Understand how motion is relative, describe different types of motion (1-d, 2-d, free-fall, circular, etc.)
- Distinguish between vector quantities and scalar quantities
- Calculate components of vectors
- Describe horizontal and vertical components of projectile motion
- State and apply Newton's Laws of Motion
- Understand and describe the role friction plays in the interaction of materials
- State and apply the law of conservation of momentum
- Describe work, power, energy and efficiency
- State and apply the law of conservation of energy
- Understand how objects behave when their motion is in a circular path
- Describe and model gravitational interactions
- Describe and model waves
- Understand the properties of sound and factors which effect its velocity
- Describe characteristics of light and light interactions
- Understand the concept of electric charges and the flow of electricity
- Understand simple electric circuits and the relationships among voltage, current, resistance and power

(Coverage of the following optional topics will depend upon the amount of time available.)

- Describe magnetic and electromagnetic interactions, and forces associated with them
- Describe the quantum nature of the atom
- Predict and give examples of radioactive decay
- Explain the uses of radioactive isotopes
- Understand chain reactions and uses of radioactive substances (fission/fusion)
- Understand mass-energy equivalence
- Predict behavior of objects moving at relativistic speeds

TEXTS & MATERIALS

Required Text

Walker, Physics, Pearson, 2014

Materials

Notebook
Binder or folder for returned and current paperwork
Scientific calculator and laptop computer
Pencils and black Pens

QUARTER 1

Reading assignments will come from the text and selected sources. Your text will normally be left at home, other readings will be provided.

Text or Article…….	**Pages to be Read**
Chapter 1 – Introduction to Physics	**2-34**
Chapter 2 – Introduction to Motion	**43-65**
Chapter 3 – Acceleration	**73-101**
Chapter 4 – Vectors	**113-140**
Chapter 5 – Newton's Laws	**151-176**
Chapter 6 – Work and Energy	**189 – 216**

QUARTER 2

Text or article	**Pages**
Chapter 7 - Linear Momentum & Collisions	**229-256**
Chapter 8 – Rotation and Equilibrium	**267-296**
Chapter 9 – Gravity and Circular Motion	**307-332**
Chapters 10,11 – Temperature, Heat, Thermodynamics*	**343-406**

QUARTER 3

Text or Article…….	**Pages**
Chapter 13 - Oscillations and Waves	**453-482**
Chapter 14 – Sound	**493-518**
Chapter 15 – Light	**529-553**
Chapter 16 - Reflection and Mirrors	**565-586**
Chapter 17 - Refraction and Lenses	**597-627**
Chapter 18 - Interference and Diffraction *	**637-664**

QUARTER 4

Text or Article…….	**Pages**
Chapter 19 – Electric Charges and Forces	**675-694**
Chapter 20 – Electric Field and Energy	**705-734**
Chapter 21 – Electric Current and Circuits	**745-770**
Chapters 22,23 – Magnetism and EM Induction *	**Parts of 783-840**
Chapters 24-27 - Quantum Theory, The Atom, Relativity *	**Parts of 851-966**

*Optional topics, will be covered as time permits

ASSESSMENT

Students at Iona Prep are to be prepared for class each and every day. Formative assessment takes place and may include a quiz, a "Do Now" activity, or the collection and correction of homework. In addition, each marking period includes summative assessment which may include unit tests, projects, presentations, or longer writing projects. During each quarter the following summative assessments are planned:

# of	**Assessment…….**	**% of the Quarter Grade**
2 – 4	*Tests, projects, presentations*	*50%*
	Quizzes, Homework and Labs	*50%*
		100%

RUBRIC

Generally, assignments (homework, labs and projects) are graded with three factors: completeness, accuracy, and neatness. An assignment may have a specific, individualized rubric.

	Beginning 1	Developing 2	Accomplished 3	Exemplary 4
Completeness	Most tasks were not completed	Less than 50% of lab tasks / write up completed	Most of tasks completed	All tasks completed, no omissions
Accuracy	Presents illogical explanation of findings	Presents an illogical explanation for findings and addresses few questions	Presents a logical explanation for findings and accurately addresses some questions	Presents a logical explanation for findings and accurately addresses most questions
Neatness	Illegible writing, loose items	Legible writing / typed, many typos	Legible writing / typed, few typos, charts and pictures provided	Extreme care taken. All elements correctly placed and well thought out

ATTENDANCE AND LATE WORK

In order to be successful in this class regular attendance is mandatory. Missing class time makes it much more difficult for the student to keep up with the material. It is the responsibility and expectation of the student to check my web page (ionaphysics.org) for assignments and to complete assignments on time. Normally, no credit will be allowed for late assignments. In the case of an absence, work is due the day the student returns to school.

Absent for a class test

It is good practice to return and review graded tests as soon as possible after the test has been administered. For that reason, if a student is absent on a day when a test is given, he will normally be expected to take the missed test on the day he returns to school. That way, after all tests have been administered, they may be graded, returned and reviewed.

Academic Integrity Policy

Iona Prep's Academic Integrity Policy is simple: Cheating, in any guise **whether giving or receiving information**, is morally wrong and will not be tolerated. As a Catholic community, it is vital that each member appreciates and practices a strong code of ethics.

Cheating (includes, but is not limited to)

- **Giving or receiving** information about the content of a quiz, test, exam, or other assessment

- **Giving or receiving** answers during a quiz, test, or exam
- Consulting with others or outside resources when instructed not to do so
- Manufacturing or changing data, inventing outside sources, falsely attributing quotations, or making up quotations and crediting them to a real or fictitious source
- Doing someone else's work, or claiming ownership of someone else's work
- Submitting the same paper, or largely the same paper, in more than one course
- Referring to notes, outlines, timelines, calculators, or translators during quizzes, tests, essays, and exams, unless told to do so by the teacher
- Using a calculator or any other electronic device in a manner inconsistent with guidelines provided by the teacher

Plagiarism (includes, but is not limited to)

- Intentionally or unintentionally using words, images, or ideas without proper citation
- Paraphrasing a source without proper citation
- Misrepresenting in any way someone else's intellectual property

The student has the responsibility of conducting himself in a manner that is above suspicion. This same responsibility applies to all classroom performance, daily and weekly quizzes and tests, homework assignments, outside readings, papers, and final examinations.

Should a teacher find that a student has cheated or plagiarized on an exam, test, quiz, homework assignment, or plagiarized a paper, **he or she should contact the Dean of Academics immediately.** The following repercussions are consistent with school policy:

- **1st offense** - The student may or may not have the opportunity to redo the assignment/assessment for partial credit. The teacher will contact the student's parents regarding the incident and the consequences.
- **2nd offense** - At the discretion of the Administration, the student may receive no credit for assignment/assessment; teacher will confer with Dean of Students. The parents/guardians will be contacted by the Dean of Academics and the student will be referred to the Dean of Students and to the School Counselor.
- **3rd offense** - The student will receive no credit for assignment/assessment and meeting with parents and Administration is mandatory.

Progressive egregious offenses will lead to further disciplinary action that may result in dismissal.

Midterms and Finals

Students found cheating on a midterm or final exam will receive an automatic zero for that midterm or final, which will result in a 0 on their report card. Infractions include:

- Operating any electronic device once the exam has started
- Accessing any website away from their exam module
- Using any notes or cheat sheet

- Any other action used to gain an unfair advantage

The aforementioned policy applies to a **student's career at Iona Prep;** it is not per class or academic year.