Physics I offers a curriculum that emphasizes students' understanding of fundamental physics concepts while helping them acquire tools to be conversant in a society highly influenced by science and technology.

The course provides students with opportunities to learn and practice critical scientific skills within the context of relevant scientific questions. Topics include the nature of science, math for physics, energy, kinematics, force and motion, momentum, gravitation, chemistry for physics, thermodynamics, electricity, magnetism, waves, nuclear physics, quantum physics, and cosmology.

Scientific inquiry skills are embedded in the direct instruction, wherein students learn to ask scientific questions, form and test hypotheses, and use logic and evidence to draw conclusions about the concepts. Lab activities reinforce critical thinking, writing, and communication skills and help students develop a deeper understanding of the nature of science.

Throughout this course, students are given opportunities to understand how physics concepts are applied in technology and engineering. Practice activities provide additional opportunities for students to apply learned concepts and practice their writing skills. Exploration activities challenge Honors students to deconstruct scientific claims, analyze scientific articles, and suggest follow-up experiments or topics for further research. Finally, Project activities allow Honors students to use scientific process skills to delve deeper into topics.

This course is built to state standards, the American Association for the Advancement of Science (AAAS) Project 2061 benchmarks, and the National Science Education Standards (NSES).

Length: Two Semesters

Unit 1: Introduction to Physics

- The Process of Science
- Math in Physics
- Math for Motion
- Doing Science: Introduction to Physics
- Introduction to Physics Wrap-Up

Unit 2: Energy

- Energy and Forces
- Conservation of Energy
- Useful Energy
- Doing Science: Energy
- Energy Wrap-Up

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Unit 3: Kinematics

- Displacement, Velocity, and Acceleration
- Nonlinear Motion
- Doing Science: Kinematics
- Kinematics Wrap-Up

Unit 4: Dynamics

- Force and Motion
- Calculations with Forces
- Doing Science: Dynamics
- Dynamics Wrap-Up

Unit 5: Momentum and Gravitation

- Momentum
- Harmonic Motion
- Planetary Physics
- Doing Science: Momentum and Gravitation
- Momentum and Gravitation Wrap-Up

Unit 6: Semester 1 Review and Exam

- Semester 1 Review and Exam

Unit 7: Chemical Physics

- Chemistry for Physics
- Introduction to States of Matter
- Doing Science: Chemical Physics
- Chemical Physics Wrap-Up

Unit 8: Thermodynamics

- Laws of Thermodynamics
- Energy Change
- Doing Science: Thermodynamics
- Thermodynamics Wrap-Up

Unit 9: Electricity and Magnetism

- Electricity
- Electrical Circuits
- Magnetism and Electromagnetism
- Doing Science: Electricity and Magnetism
- Electricity and Magnetism Wrap-Up

Unit 10: Waves

- Introduction to Wave Motion
- Sound and Light
- Optics
- Doing Science: Waves

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- Waves Wrap-Up

Unit 11: Modern Physics

- Nuclear Physics
- Quantum Physics
- Cosmology
- Doing Science: Modern Physics
- Modern Physics Wrap-Up

Unit 12: Semester 2 Review and Exam

- Semester 2 Review and Exam

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