

Physics II A/B

Colorado Springs Early Colleges

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Introduction

Physics is the study of matter and energy and their interactions. We will study the main areas of physics and focus on conceptual understanding. *Mathematics will be introduced after students understand the concepts.* * Math is the language of physics. Students will learn how to interpret physical data and apply it to physical science principles.

**This course is algebra-based and students are expected to understand and apply basic algebraic principles including: solving simple equations with one unknown variable; solving multiple equations with multiple unknown variables. Problem-solving methods will be taught and many problems will be demonstrated during class. Students will use some trigonometry (Pythagorean Theorem; sine, cosine, and tangent relationships) to study vectors on a basic level, and these methods will be taught during the course. Students will be required to use exponents.*

Unit Information

Subjects will be covered in units that span one or more chapters in the book, *Conceptual Physics, 9th Edition, Paul Hewitt, 2002 (ISBN: 0321052021)*:

1. **Unit 1 – Scientific method, measurement, science and art, technology, and religion**
 1. Chapter 1 – About Science
2. **Unit 2 – Laws of Motion**
 1. Chapter 2 – Newton’s 1st Law: Inertia
 2. Chapter 3 – Linear motion
 3. Chapter 4 - Newton’s 2nd Law: Force and acceleration
 4. Chapter 5 – Newton’s 3rd Law: Forces and interactions
 5. Chapter 6 – Momentum
3. **Unit 3 – Motion and Energy**
 1. Chapter 7 – Energy, work, and machines
 2. Chapter 8 – Rotational motion
 3. Chapter 9 – Gravity
 4. Chapter 10 – Projectile and satellite motion
4. **Unit 4 – Properties of Matter**
 1. Chapter 11 – Atomic properties
 2. Chapter 12 – Solids
 3. Chapter 13 – Liquids
 4. Chapter 14 – Gases and plasmas
5. **Unit 5 – Heat**
 1. Chapter 15 – Temperature, heat, and expansion
 2. Chapter 16 – Heat transfer
 3. Chapter 17 – Change of phase
 4. Chapter 18 – Thermodynamics
6. **Unit 6 – Sound**
 1. Chapter 19 – Vibrations and waves

2. Chapter 20 – Sound
3. Chapter 21 – Musical sounds
7. **Unit 7 – Electricity and Magnetism**
 1. Chapter 22 – Electrostatics (electrical forces and charges)
 2. Chapter 23 – Electric current
 3. Chapter 24 – Magnetism
 4. Chapter 25 – Electromagnetic induction
8. **Unit 8 – Light**
 1. Chapter 26 – Properties of light
 2. Chapter 27 – Color
 3. Chapter 28 – Reflection and refraction
 4. Chapter 29 – Light waves
 5. Chapter 30 – Light emission
 6. Chapter 31 – Light quanta
9. **Unit 9 – Atomic and Nuclear Physics**
 1. Chapter 32 – Atomic and quantum physics
 2. Chapter 33 – Atomic nucleus and radioactivity
 3. Chapter 34 – Nuclear fission and fusion
10. **Unit 10 – Relativity**
 1. Chapter 35 – Special theory of relativity
 2. Chapter 36 – General theory of relativity

Point Breakdown (includes both semesters, one midterm and one final per semester)

1. **Unit packet** (will include the following):
 1. Activity worksheets (10 pts per unit) (100 pts possible)
 2. Project worksheet (20 pts per unit) (200 pts possible)
 3. Book assignments (10 pts per chapter) (360 pts possible)
2. **Chapter Quizzes** (20 pts per chapter) (720 pts possible)
3. **Midterm Tests** x 2 (100 pts) (200 pts possible)
4. **Semester Finals** x 2 (100pts) (200 pts possible)

Grading

Grades will be calculated from total points earned divided by total points possible according to the table below:

Percentage %	Grade Awarded
93-100	A
90-92.9	A-
87-89.9	B+
83-86.9	B
80-82.9	B-
77-79.9	C+
75-76.9	C