

Trumbull Career and Technical Center
Mrs. Frankland
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Room D109a
Physics
2011-2012

Purpose: This algebra-based course is designed for the student who wants to master the concepts of motion, energy, electricity, waves, sound, optics, heat, thermodynamics, relativity, quantum mechanics, and nuclear energy (if time). Laboratory work will be included to provide reinforcement to classroom instruction. Expectations for students enrolled in physics are high. Students should be able to solve problems independently and be able to apply the concepts learned in class to the laboratory exercises. Students should be able to make appropriate choices when designing and participating in scientific investigations by using cognitive and manipulative skills when collecting data and formulating conclusions from the data. In addition to the central curriculum of physics, some classroom work will ask students to consider the role science and technology play in society. For instance, how will human choices today determine the quality and quantity of life on Earth? How is scientific evidence used to develop and revise scientific predictions, ideas or theories?

Materials: Text “Physics” (Giancoli)
Notebook of your choosing
Calculator (TI-30 or higher is a good choice)
Protractor
Composition Lab Notebook

Course Outline:

Part 1: Mechanics

Section 1: Introduction, Measurement, and Graphing

- A. Nature of Physics
- B. Units
- C. Measurement

Section 2: One-Dimensional Motion-Kinematics

- A. Graphical Analysis of Motion
- B. Vectors
- C. Mathematical Analysis of Motion

Section 3: Two-Dimensional Motion

- A. Projectiles
- B. Relative Motion

Section 4: Forces and Newton’s Laws of Motion

Section 5: Applications of Newton’s Laws

- A. Uniform Circular Motion
- B. Satellite Motion

Section 6: Work and Energy

- A. Work
- B. Work-Energy Theorem
- C. GPE

- D. Power**
- E. Conservation of Mechanical Energy**

Section 7: Impulse and Momentum

- A. Impulse and Momentum Theorem**
- B. Conservation of Momentum**
- C. Collisions**

Part 2: Electricity and Magnetism

Section 1: Electric Forces and Electric Fields

- A. Conductors and Insulators**
- B. Charging by Contact**
- C. Coulomb's Law**
- D. The Electric Field**

Section 2: Electric Circuits

- A. Potential Difference and Current**
- B. Resistance**
- C. Ohm's Law**
- D. Electric Power**
- E. AC and DC Current**
- F. Series and Parallel Wiring**

Section 3: Magnetism and Magnetic Fields

Part 3: Waves, Sound, and Optics

Section 1: Waves and Sound

- A. Nature of Waves**
- B. Nature of Sound**
- C. Applications of Sound**
- D. The Doppler Effect**
- E. Linear Superposition**
- F. Interference**
- G. Diffraction**
- H. Beats**
- I. Standing Waves**

Section 2: Light and Optics

- A. Electromagnetic Waves, Spectrum**
- B. Speed of Light**
- C. Reflection, Refraction**
- D. Lenses**
- E. Human Eye, Microscope, Telescope, Camera**

Standards:

- 1. The student will apply the principles of forces and motion to mathematically analyze,**

describe, and predict the net effects on objects or systems.

- 2. TSW explain the movement of objects by applying Newton's three laws of motion.**
- 3. TSW demonstrate that energy can be considered to be either kinetic or potential**
- 4. TSW demonstrate that waves have energy and can transfer that energy when they interact with other matter.**
- 5. TSW demonstrate how electrical current travels.**
- 6. TSW will explore and summarize observations of the transmission and reflection of light.**

Assessment (Percentages are approximate)

30% Quizzes

30% Laboratory

20% Homework

20% Project

Possible Points

Usually between 500-600 points. Subject to change.

Grade Scale

92-100 A

83-91 B

74-82 C

66-73 D

65-0 F

Midterm and Final Exams

There will be NO exemption from midterms or finals for having A's during any or all of the nine weeks' grading periods. This is analogous to a „free lunch“ for which, I believe, does not exist. There is however the possibility of earning a pass from the final exam (more details later).