

## Honors Physics Course Outline

Text: Serway, Raymond A. and Jerry S. Faughn. *Holt Physics*. Orlando: Houghton Mifflin Harcourt, 2012.

Materials: Throughout the course, basic physics lab equipment will be used. A scientific calculator is required for the course. Resources provided through the online textbook, as well as Internet resources, interactive websites, and iPad apps are also used. Class materials and vodcasts of class lectures are provided on *NCS Chemistry and Physics*, at <http://tskinnersbec.edublogs.org/>.

### Third Nine Weeks

#### 1. Circular Motion and Gravitation (3.5 weeks)

##### A. Objectives

1. Torque
2. Rotational motion
3. Centripetal acceleration
4. Centripetal force
5. Newton's Law of Universal Gravitation
6. Weightlessness

##### B. Activities, Assessment, and Materials:

1. Experiment: Torques
2. Experiment: Centripetal Acceleration
3. GLX Experiment: Newton's Second Law
4. Project: King of the Hill Competition
5. Engineering Design Challenge
6. Homework – chapter review and worksheets
7. Science in the News summaries
8. Web posts
9. Test on chapter – circular motion and gravitation

##### C. Biblical Integration - God established consistent laws to govern all aspects of creation.

#### 2. Fluid Mechanics (2 weeks)

##### A. Objectives

1. Buoyancy
2. Archimedes Principle
3. Bernoulli's Law

##### B. Activities, Assessment, and Materials:

1. Experiment: Bernoulli's Principle
2. Engineering Design Challenge
3. Take home labs
4. Homework – chapter review and worksheets
5. Web posts

6. Science in the News summaries
  7. Test on chapter – fluid mechanics
- C. Biblical Integration - God established consistent laws to govern all aspects of creation.
- 3. Vibrations and Waves (1 week)**
- A. Objectives
1. Simple harmonic motion
  2. Properties of waves
  3. Wave interactions
- B. Activities, Assessment, and Materials:
1. Experiment: Bungee Jumping Egg
  2. Experiment: Waves
  3. Engineering Design Challenge
  4. Take home labs
  5. Homework – chapter review and worksheets
  6. Science in the News summaries
  7. Web posts
  8. Test on chapter – vibrations and waves
- C. Biblical Integration – God has given us tools to use to understand the world around us. Genesis 1: 26 - 28
- 4. Sound (2 weeks)**
- A. Objectives
1. Production and characteristics of sound waves
  2. Sound intensity and resonance
  3. Harmonics
- B. Activities, Assessment, and Materials:
1. Experiment: Speed of Sound
  2. Experiment: Resonance and the Nature of Sound
  3. Engineering Design Challenge
  4. Take home labs
  5. Homework – chapter review and worksheets
  6. Science in the News summaries
  7. Web posts
  8. Test on chapters – vibrations, waves and sound
- C. Biblical Integration – God has given us tools to use to understand the world around us. Genesis 1: 26 - 28