

# High School Physics - Syllabus - 2014-2015

*Santa Cruz Learning Center*

(Revised 19 Oct. 2014, revisions below in blue)

## Course Title/Transcript Code

a-g Physics A: **6E1007**

a-g Physics B: **6E1014**

## Instructor Information

Name: Donez “Donny” Horton-Bailey

Email: [donny.sclc@gmail.com](mailto:donny.sclc@gmail.com)

## Course Description

Throughout the course of the year, the students gain an appreciation of Laws of Nature (Physics) by engaging in experiments and relating experimental data to physical scientific concepts. In this one year course, students will cover measurement, vectors, Laws of Motion, work and energy, momentum and collisions, circular motion, gravitation, heat, thermodynamics, waves, sound, light, refraction, electrical energy and current, circuits and magnetism, and atomic physics.

The general objective of this course is to provide a clear conceptual development and practice with both fundamental physics concepts and problem solving skills. Students will develop abilities necessary to meet the following learning outcomes: understand scientific inquiry, build an understanding of linear motion and two dimensional motion including circular motion, develop an understanding of forces and Newton’s Laws of Motion, describe and apply concepts of impulse and momentum, develop an understanding of energy as the ability to cause change, describe wave motion and the wave nature of sound and light, express and understanding of static electricity and direct current electrical circuits.

## Prerequisites

Completion of Algebra 1 with a grade of “C” or better.

## Required Textbook

HOLT PHYSICS, California Edition; 2007; Holt, Rinehart and Winston

## Supplemental Instructional Materials

Physics with Vernier (Lab Manual) 2007

## Course Outline

- **UNIT 1 - Introduction to Physics**
  - Appendix A: Mathematical Review
  - Chapter 1: The Science of Physics
- **UNIT 2 - Kinematics and Dynamics**
  - Chapter 2: Motion in One Dimension
  - Chapter 3: Two-Dimensional Motion and Vectors
  - Chapter 4: Forces and The Laws of Motion
- **UNIT 3 - Energy, Momentum and Gravitation**
  - Chapter 5: Work and Energy
  - Chapter 6: Momentum and Collisions
  - Chapter 7: Circular Motion and Gravitation
- **UNIT 4 - Heat and Thermodynamics**
  - Chapter 9: Heat
  - Chapter 10: Thermodynamics
- **UNIT 5 - Waves and Fluids**
  - Chapter 11: Vibrations and Waves
  - Chapter 12: Sound
  - Chapter 8: Fluids
- **UNIT 6 - Optics**
  - Chapter 13: Light and Reflection
  - Chapter 14: Refraction
  - Chapter 15: Interference and Diffraction
- **UNIT 7 - Electricity**
  - Chapter 16: Electric Forces and Fields
  - Chapter 17: Electrical Energy and Current
  - Chapter 18: Circuits and Circuit Elements
- **Unit 8 - Magnetism**
  - Chapter 19: Magnetism
  - Chapter 20: Electromagnetic Induction
- **UNIT 9: Modern Physics (If time Allows)**
  - Chapter 21: Atomic Physics
  - Chapter 22: Subatomic Physics
  - Appendix J: Advanced Topics

## Grade Breakdowns

### Assignments and Activities (60%):

- Warm-Up Questions/Quizzes: 10%
- Classwork: 15%
- Homework: 25%
- Projects: 10%

### Exams (20%):

Unit tests will be weighted equally and averaged: 20%

### Laboratory Work (20%):

- Pre-Lab Assignments: 5%
- Post-Lab Assignments: 15%

### Grading Scale:

- 90-100% A
- 80-89% B
- 70-79% C
- 60-69% D
- below 60% F

All grades for assignments will be posted on the ThinkWave site  
(<https://www.thinkwave.com/secure/login/>)

## Readings

There will be readings assigned for most class days. Please do the assigned reading before class. Reading quizzes will be given in place of warm-up some mornings.

## Homework Assignments

Homework will be posted and due weekly, unless otherwise specified. I do not encourage waiting until the last minute to begin a homework assignment. A good strategy is to break the assignment into chunks; do a few problems per day over a few days instead of all of the problems in one day. I will be available by email if you need help with the homework.

Homework assignments may be revised for up to half of the missed points. Homework revisions will be due one week after the homework is returned. Old and new scores will be averaged. Please follow the section below titled "Turning in Assignments" for more information about the format of homework revisions.

## Classwork

Every class there will be an assignment or activity that we go through together as a class. Students get credit for hard work and participation in group work.

## Warm-Up and Quiz Questions

Every class will begin with a five-minute warm-up question or quiz question. These will be done on 3" by 5" note cards. The blank side will have the question and the lined side will be for the response. The warm-up questions are based on the previous class(es)' material. The students will be able to work on the warm-up questions together and use their book/notes. The quizzes will be based on the assigned reading. The quizzes will be unannounced, and they will occur once every 1-3 weeks. Students will not be allowed to use their book or notes for quizzes. Each question (card) will be scored on a five point scale. The average of these scores will represent 10% of the student's final grade.

## Unit Tests

The course is divided into nine units. There will be one test for each unit. The test will consist of conceptual and problem solving questions. Half of the conceptual questions will come from that unit, and the other half will come from previous units. All of the problem solving questions will come from that unit. The tests will be averaged, and the overall score will be 20% of the final grade.

## Projects

There will be about two projects per semester. These projects are meant to be a fun way for students to utilize what they've learned in class.

## Laboratory

A two-hour laboratory section will be held every-other week. For each laboratory session, there will be pre-lab and a post-lab assignment. The purpose of the pre-lab is to get the student familiar with the experiment ahead of time, so that they have a better understanding of what they are doing in lab. The purpose of the post-lab is to review the results of the lab. The prelab assignment will be turned in when the student arrives at lab. The post-lab assignment will be turned in during class about one week after lab.

This semester (Fall 2014), the lab will be held every other Friday, 1:30 pm -- 3:30pm starting October 17, 2014.

## Staying Organized

All students will be required to either have a three-ring binder, or a divided section of a three-ring binder dedicated to this class. All classwork and homework must be three-hole punched and

## Turning in Assignments

**All submitted assignments:** must be on **three-hole punched** 8½" by 11" blank or lined paper. If turned in on blank paper, the paper must be three-hole punched. Make sure to leave room in the margin for the holes.

**Homework and Lab Assignments:** These may be handwritten or typed. If handwritten, work must be done in **neat and legible** pencil or blue or black ink. If an assignment is typed, the font must be size 12-point, and must be a standard print font (i.e. Times New Roman, Arial, Helvetica, Calibri, or a similar font). Long paragraphs should be double spaced.

**Homework Revisions:** Revisions must be done on separate paper.

For problems that received **full points**, just skip them.

For problems that **did not receive full points**, redo the entire problem showing all work.

Staple revision on top of the previously turned in homework.

## Late Assignments

For every class day (Mon/Wed) that an assignment is late, its score will be reduced by 10%. That is, if an assignment receives an initial score  $IS$  and is turned in  $n$  class days late, the final score  $FS$  will be

$$FS = IS \times (0.9)^n$$

Example: Sally turned her lab report in three days late. She worked hard on it and got a 95%. Her finals score is then

$$FS = 95 \times 0.9 \times 0.9 \times 0.9 = 69\%$$

## Instructional Methods and/or Strategies

Instructional methods include, but are not limited to:

- Direct Instruction
- Teacher demonstration
- Lecture
- Guided practice
- Laboratory Experimentation
- Cooperative problem solving
- Student-directed personal study
- Discussion
- Tutorials
- Multimedia presentations
- Regular access to Subject Matter Expert (SME)

## Assessment Methods and/or Tools

Methods by which student progress is assessed will be through a variety and/or combination of methods. The methods available include but are not limited to the following:

- Regular review of work by Education Specialist (credentialed teacher) and Subject Matter Expert (SME)
- Regular access to Subject Matter Expert (SME)
- Portfolios
- Observation by Parent Facilitator, Education Specialist, and Subject Matter Expert (SME)
- Student demonstrations
- Discussion
- Student grades
- Student work samples
- Written examination
- Student participation in lab activities