COURSE OUTLINE

NAME OF COURSE PHYSICAL SCIENCE

COURSE NUMBER: SCI 30 **WRITTEN / REVISED:** September, 2011

LEVEL OF COURSE: Special Education Replacement **NUMBER OF CREDITS:** 6

PREREQUISITES: NONE **GRADE LEVELS OFFERED TO:** 11-12

COURSE DESCRIPTION:

Material for this course is presented experientially. It is supplemented by video and computer media. Both formal and informal experiments will be conducted. Students will also work on projects individually and in groups. Active participation and co-operation are essential for successful completion of this course. Additional assignments from other sources will be required. The course will incorporate mathematics, history, chemistry, physics and social sciences. We will integrate mathematics as a tool for problem solving in science, and as a means of expressing and/or modeling scientific theories. All students will apply their understanding of natural laws as they apply to motion, forces, and energy transformations. All students will develop problem-solving, decision-making and inquiry skills, conducting systematic observations, interpreting and analyzing data, drawing conclusions, and communicating results.

COURSE OBJECTIVES:

When this Physics course has been completed successfully, students should be able to:

1. Contribute to the general intellectual development of their fellow students.

2. Be a problem solver, developing analytic skills.

3. Be given opportunity to reason, to learn to express their thoughts clearly, and to be able to f follow the development of ideas presented, whether orally or written.

4. Analyze results and to distinguish between the essential and peripheral.

5. Sharpen the students' skills as observers and experimenters.

6. Develop the student’s aesthetic sense and understanding of the basic laws of physics.

EACH UNIT IS BASED ON THE FOLLOWING GOAL:

The student will gain an understanding of and apply the concepts indicated in the behavioral objectives via problem solving experiments and completing scenario challenges.

CORE CONTENT STANDARDS ADDRESSED:

5.1 - Scientific Practices **5.2 - Physical Science**

SPECIFIC BEHAVIORAL OBJECTIVES/PROFICIENCIES AND TIME LINES:

Unit # 1 Rocketry and Flight

Time = 45 days

Objectives:

1. Describe the relationship of speed, distance and time
2. Differentiate between average and instantaneous speed
3. Use data as basis for prediction
4. Use data tables and graphs to display data gathered through lab experiences
5. Describe kinetic energy
6. Calculate acceleration
7. Identify frictional forces
8. Differentiate between speed and velocity
9. Describe projectile motion
10. Understand the effect of gravity on motion
11. Describe the law of conservation of energy
12. Identify the relationship between changing variables and differences in outcome
13. Describe Newton's Laws of Motion

Unit # 2 Simple and Compound Machines **Time = 45 days**

Objectives:

1. Identify each of the types of simple machines and common environmental examples
2. Describe compound machines
3. Identify the relationship between input effort, output effort, and fulcrum
4. Explain calculate efficiency
5. Calculate work
6. Calculate power
7. Apply simple machines to solving daily living problems.
8. Describe the relationship between potential and kinetic energy

Unit # 3 Sound and Light **Time=35 days**

Objectives:

1. Recognize factors that affect the speed of sound
2. relate loudness and pitch to properties of sound waves
3. Identify physical properties of musical instruments that allow for quality sound production
4. Explain how sonar and ultrasound work
5. Describe the function of the ear.
6. Recognize that light has both wave and particle characteristics.
7. Describe the parts of the electromagnetic spectrum
8. Explain EM waves are used in industry.
9. Explain why objects appear to be different colors
10. Explain the law of reflection
11. Describe how colors may be added or subtracted
12. Identify the function of the eye

Unit # 4 Electricity and Magnetism **Time=35 days**

Objectives:

1. Identify the attracting and repelling charges
2. Describe the components needed to construct and electromagnet
3. Explain the factors that affect the strength of electric force
4. Distinguish between conductors, superconductors, semiconductors, and insulators
5. Define resistance
6. Describe the difference between parallel and series circuits
7. Explain the function of fuses and circuit breakers

Unit # 5 Water **Time=25 days**

1. Describe the properties of water
2. Identify the chemical composition of water in the local watershed
3. Calculate stream flow
4. Identify factor that affect erosion and deposition in local stream beds.
5. Identify factors that affect water quality in the local watershed
6. Describe factors that affect freshwater marine life

Lab Experience

1. Streambed Calculations Teacher Generated
2. Ongoing water quality testing in classroom
3. Trout In The Classroom TBA

Evaluation:

1. Streambed lab
2. TU activity
3. Homework
4. Journal
5. Quizzes

MATERIALS / RESOURCES:

1. Text: Conceptual Integrated Science - Addison and Wesley, 2007

2. Text: Conceptual Physics, Hewitt -- -- Addison and Wesley,1997

EVALUATION:

A. STUDENT PROGRESS:

1. Projects/lab 50%
2. Homework/Journal 10%
3. Tests and quizzes 30%
4. Class Participation 10%

The mid-term and final examinations are each 10% of the yearly grade.

PERIODIC EVALUATION OF OBJECTIVES AND GUIDE:

This curriculum will be evaluated in summer 2012.

High Point Regional High School's curriculum and instruction are aligned to the State's Core Curriculum Content Standards and address the elimination of discrimination by narrowing the achievement gap, by providing equity in educational programs and by providing opportunities for students to interact positively with others regardless of race, creed, color, national origin, ancestry, age, marital status, affectionate or sexual orientation, gender, religion, disability or socioeconomic status