PHYSICS Syllabus 2016-2017

INSTRUCTOR	Don Aldrich	**Days/Period**:	1:39 – 2:32 Mon - Fri
PREREQUISITE	Physical Science, Chemistry, Algebra II or at the discretion of the instructor	**Duration**:	Semester 1 and 2
TEXTBOOK	Prentice Hall Conceptual Physics for High School copyright 2009		
CONTACT INFO.	Schedule for office and classroom: 7:30 – 4:30 Mon –Thur. 7:30 – 3:00 Fri. or by appointment, Instructor: Don Aldrich Telephone: (269) 339 – 3362(H) Please do not call my home after 10:00 p.m. 269-965-1278 Ext 1029 Classroom, daldrich@battlecreekacademy.com		

PURPOSE OF COURSE: To teach of Jesus through the study of the world of Physics around us and its effect on our lives. To help prepare students for college or a career choice.

CONTENT DESCRIPTION: A course that studies the physics of motion, sound, light, energy, magnetism, electricity, gravity and other areas of Physics around us. This upperclassman course requires competence utilizing and generalizing mathematical concepts gained from previous courses taken.

REQUIRED TOOLS FOR SUCCESS: Text, composition book, notebook paper, willingness to open mind and learn, **other objects as described and utilized during class experiments.**

EXPECTATIONS OF STUDENTS:

1. Be on-time for class. Attendance is of the utmost importance. If you are not in the classroom then there is no learning. You are expected to be in your seat with materials ready when the bell rings.
2. Return Assignments Timely. Homework, in-class assignments, projects, or any other means of you communicating your understanding of the topic is expected to be turned in at the specified time. Allowance for late work is at the discretion of the instructor. Be prudent in managing and organizing your time.
3. Attempt All Assignments. Your input to each area of discovery and study is of vital importance. **ALWAYS** try to accomplish something towards the final objective. This will enhance your experience and give life-long skills.
4. Complete All Assignments. Completeness gives a sense of well-being and accomplishment. Do **YOUR BEST** in all. Try **EVERYTHING**. Understanding takes time, effort, and willingness. Your best and complete attempt will make an impact on the outcome. **NEVER** give up!! If at any time you have questions and you have exhausted all possibilities of answering, feel free to come by my office during the hours listed or send an e-mail. We will find a way to gain understanding. This is a cooperative venture and the end result is up to you.

COURSE FOCUS

PHY.1 Identify SDA Christian principles and values in correlation with science.

PHY.1.1 Recognize God's power as Designer, Creator, Sustainer, and Redeemer in the universe.

PHY.1.2 Acknowledge God as the Author of all scientific principles and laws regardless of man's interpretation.

PHY.1.3 Develop stewardship and service attitudes toward health, life, and earth's environment.

PHY.1.4 Apply Biblical principles of Christian morality, integrity, and ethical behavior to all aspects of life.

PHY.1.5 Equip students with Christian perspectives on scientific issues.

COURSE ABILITIES

PHY.2 Develop abilities in science.

PHY.2.1 Develop critical and creative thinking skills (analysis, evaluation, divergent questioning, modeling).

PHY.2.2 Understand and utilize the scientific method of problem solving.

PHY.2.3 Utilize the principles and methodologies of cooperative learning.

PHY.3 Be able to apply science knowledge and skills to a variety of purposes.

PHY.3.1 Recognize scientific principles and laws as tools to solve problems in everyday life.

PHY.3.2 Apply the scientific method in analysis of controversial topics, e.g., cloning, global warming, stem cell research.

PHY.3.3 Read, write, and interpret scientific documents (lab write-ups, journals, scientific publications).

PHY.3.4 Conduct research in the content area.

PHY.3.5 Engage in various uses of technology

COURSE CONTENT (Mechanics, Thermodynamics, Sound and Light, Electricity and Magnetism, Nuclear Physics [Understand, explore, analyze, apply]

PHY.4 Be able to understand relationships between matter and energy and how they interact.

PHY.4.1 Recognize God as the Designer and Creator of our physical world and its governing laws.

PHY.4.2 Identify the fundamental properties and laws of mechanics.

PHY.4.3 Define the properties and laws of thermodynamics.

PHY.4.4 Demonstrate an understanding of the sound and light principles.

PHY.4.5 Describe the fundamental properties of electricity and magnetism.

PHY.4.6 Understand the basic concepts of nuclear physics.

PHY.5 Be able to safely explore physics concepts.

PHY.5.1 Test the properties and laws of mechanics (Newton's laws, work, power, velocity, energy, etc.).

PHY.5.2 Explore the properties and laws of thermodynamics (laws, heat energy).

PHY.5.3 Investigate the properties of sound and light (waves, optics, etc.).

PHY.5.4 Examine the principles of electricity and magnetism (circuits, Ohm's law, forces, charges, fields).

PHY.5.5 Research the principles of nuclear physics (quantum theory, radioactivity, dating methods, etc.).

PHY.6 Be able to analyze physics data.

PHY.6.1 Predict the outcome of motion and force problems using the principles of mechanics.

PHY.6.2 Correlate changes in energy to the laws of thermodynamics.

PHY.6.3 Evaluate the conditions and factors which affect sound and light.

PHY.6.4 Analyze various electrical circuits.

PHY.6.5 Interpret the results of nuclear research.

PHY.7 Be able to apply principles of physics to health, life, and the physical environment.

PHY.7.1 Strengthen belief in God as Designer and Creator by applying the laws of physics.

PHY.7.2 Utilize the concepts of physics to improve lifestyle choices.

PHY.7.3 Apply the study of physics to issues regarding nuclear energy.

ASSESSMENT AND GRADING

EACH NINE WEEKS:	45%	Points accrued divided by Points Possible
SEMESTER EXAM:	10%	Adjusted to each Nine week grading period
GRADING SCALE:	As outlined in the Handbook	

Please note there is not a breakdown for quizzes, tests, homework, in-class work, projects or any other means of producing understanding. I believe that everything we do for this class has an impact on your understanding. Therefore, everything has the same level of importance.

SEQUENCE FOR THE YEAR

IMPORTANT: The textbook is a resource; it does not determine the content of the course though it may influence the sequence of the topics.

QUARTER 1 OUTLINE

We will focus on an introduction to physics and the basics of science as well as the Mechanics of Physics. The unit will have instruction in equilibrium, motion, inertia, energy, force, momentum, and action and reaction. More depth will be explored in the areas of motion and energy. Acceleration, Laws of motion, types of energy, linear and circular motion are some areas that will be explored. Students will utilize the text and have some hands on experience to help discover the world around them.

QUARTER 2 OUTLINE

We will continue our focus on Mechanics to finish the unit. Of importance will be rotational motion and equilibrium, Gravitation, satellites and planetary motion, relativity for mass, gravity, and energy, and relativity for space and time. Some time will be allotted for a short look at Astronomy. The last half of the quarter we will focus on the properties of Matter. We will review the atom and the phases of matter related to the atomic nature. Our focus will then change to solids, liquids, and gases to complete the semester.

QUARTER 3 OUTLINE

Our study will move towards a unit on Heat and go into a unit on Sound and Light. Temperature, heat, and expansion, transfer, change of phase, and thermodynamics are all looked at to varying degrees. We will then move into the unit on sound and light. Some topics covered are sound and its origin, use, frequency, vibration, and other facets of transmission. As we move into light we look at speed, color, electromagnetic waves, reflection, refraction, and polarization. Some of these properties are specific for sound or light while others are applicable to both. This phenomenon will be explored.

QUARTER 4 OUTLINE

We will finish the unit on sound and light, move into a unit on electricity and magnetism, and if time allows, will finish with a unit on Atomic and Nuclear Physics. We will look at reflection and refraction in greater detail and lenses that converge, diverge, images, defects, and the lens of the eye. Electrostatics, electric fields, potential current, circuits, magnetism, and electromagnetic induction are areas covered in the fifth unit. As time permits we will work on a unit of atomic and nuclear physics which deals with fission, fusion, radioactivity, and quantum physics. We will also look at the use of nuclear physics and its control.

This is a tentative syllabus and is subject to change as the progress of the student allows or as time permits. There is a large amount of hands-on experiences during this class. Thank you for your understanding.