Greater New York Academy of Seventh-day Adventists

Physics Syllabus

General Information

Instructor:	Mr. Anthony Palmer
E-mail	apalmer@gnyacademy.org
Office hours:	Tuesdays and Thursdays 3:30-4:30 by appointment
Telephone:	718-444-4747
Course length	1 year
Required Text:	Paul Zitzewitz, Robert Neff, Mark Davids, Kelly Wedding "*Physics Principles and Problems*" **:** Glencoe / McGraw-Hill (1995) ISBN# 0-02-826722-2

Course Design:

The course is designed to prepare you for the Physics Regents in June and also and more importantly to give you the Christian perspective to this physical science. God is presented as the divine creator of our physical world and has created laws to explain the relationships between all created dimensions. Special emphasis will be placed on the inadequacy of the models that were derived by fallible man to explain these observations.

Objectives:

This course is a survey of the topics, concepts and methods that comprise the field of physics. Emphasis will be placed on how physical theories are developed and the progression from Galilean and Newtonian physics to our current understanding, which incorporates quantum physics and Einstein's relativity. You can expect to learn about the laws of motion, energy, electricity, waves, and the structure of the atom. There are also a number of underlying principles and methods that thread through all of these topics. Thus, in addition to learning specifics related to each of these areas of physics, a successful student will also: Understand what a scientific model is and how it is used in scientific inquiry. Understand the philosophical underpinnings of physics and the relationship between observation and abstraction. Learn physical conservation laws. Improve problem solving and analysis skills.

Homework:

Homework will be assigned on a regular basis and should be handed in completed with full effort. These assignments reinforce the lesson and will be checked. At times the assignments will be collected and graded. A homework grade will be factored into your final average. Work not completed by the assigned due date will result in a zero grade for that homework assignment.

Greater New York Academy of Seventh-day Adventists

Classroom Management:

Respect will be given to your instructor, your classmates, classroom facilities and all education materials at all times. We are working together as a team and we need everyone to cooperate.

Assessment:

Assessment in this course will be based on tests and quizzes that will be announced. Also, classwork and homework assignments will be counted as well as some group work assignments.

Tardiness: There will be a grade penalty for work missed due to being tardy.

Physics Practicals

The Regents Examination require a minimum of 1200 minute of practical work in order to sit the examination you will be required to do these lab sessions some evenings to be announced each week. Lab sessions will be a maximum of 1.5 hours.

Required Units:

1. Mechanics
2. Energy
3. Electricity and Magnetism
4. Wave Phenomena
5. Modern Physics

Optional Units:

6. Group 1: Motion in a plane
7. Group2: Internal Energy
8. Group 3: Electromagnetic Application
9. Group 4: Geometric Optics
10. Group 5 : Solid State
11. Group 6 : Nuclear Energy

You will be introduced to all areas of the syllabus but after we have exhausted the core elements and when you are comfortable with all calculations.

Greater New York Academy of Seventh-day Adventists

Grading

Homework 15%

Test 25%

Class Work 25%

Lab 20%

Project 15%

Detailed Syllabus

Period	Unit	Topic	Material	Assignment	Assessment
Sept 8	Introduction	Physics ,the Scientific Method and the God of Creation	Student Edition – (SE) Physics Multimedia	• Selected end of Chapters Question and problems. • Lab Practical	• End of Chapter Test • Unit Test
Sept 9,13	Mathematical Toolkit	1. The Measure of Science 2. Scientific Notation 3. SI Units 4. Certainty 5. Displaying Data 6. Manipulating Equation	Student Edition – (SE) Physics Multimedia Chapter 2	• Selected end of Chapters Question and problems. • Lab Practical	• End of Chapter Test • Unit Test
Sept 15 Oct. 22	Mechanics	• Distance and Displacement • The Meter • Velocity and Speed • Acceleration • Final Velocity and distance traveled by an object at constant acceleration, average speed average velocity and uniform velocity	Student Edition – (SE) Physics Multimedia Equipment Lab Apparatus	• Selected end of Chapters Question and problems. • Lab Practical	• End of Chapter Test • Unit Test

Period	Unit	Topic	Material	Assignment	Assessment
		• Free Falling objects	Chap. 5,6		
Oct 25-Nov 11	Mechanics	Statics • Force • Vector Addition of Concurrent forces • Resolution of Forces • Equilibrium	Student Edition (SE) Merrill Chap. 5,6 Multimedia equipment.	Selected Questions from the end of chapter. Study Guide Exercises for reinforcement . Transparency masters exercises.	Chapter test at the completion of each chapter. Lab

Nov 15-29	Mechanics	Dynamics
		A. Force, mass and acceleration, Gravitational and inertial properties of objects
		• First law of motion
		• Secon Law of Motion
		• Newtons's Universal Law of Gravitation
		• Gravitational Field Strength
		• Weight
		• Friction
		  • Coefficient of Friction
		  • Static Friction
		  • Kinetic Friction
		  • Rolling Friction
		  • Fluid Friction
		Momentum
		• Impulse
		• Change in momentum
		• Law of conservation of Momentum
			Student Edition (SE) Merrill Chap. 5,6	Selected Questions from the end of chapter. Study Guide Exercises for reinforcement . Transparency masters exercises.	Chapter test at the completion of each chapter. Lab

Period	Unit	Topic	Material	Assignment	Assessment
		• Third law of motion			
Nov 29- Dec. 9	Energy	Work and Energy • Work • Power • Energy a) Potential Energy I. Gravitational Potential Energy II. Elastic Potential Energy b)Kinetic Energy • Work Energy Relationship • Conservation of Energy	Student Edition (SE) Merrill Chap 10,11,12	Selected Questions from the end of chapter. Study Guide Exercises for reinforcement . Transparency masters exercises.	Chapter test at the completion of each chapter. Lab
Dec 13- Feb 23	Electricity and Magnetism	1) Static Electricity a) Micro structure of matter b) Charged Objects c) Conservation of charge d) Elementary charges e) Coulomb's Law f) Electric Field i) Around a point ii) Between two parallel plates iii) Electric potential g) Potential Difference i) The Volt ii) The electronvolt iii) Electric field in terms of Electric potential 2) Electric Current	Student Edition (SE) Merrill Chap.20-25	Selected Questions from the end of chapter. Study Guide Exercises for reinforcement . Transparency masters exercises.	Chapter test at the completion of each chapter. Lab

Period	Unit	Topic	Material	Assignment	Assessment
		a) Conductivity in solids b) Conditions necessary for electric current c) Unit of current d) Resistance of a conductor i) Ohm's Law ii) Resistance iii) Resistance in a conductor e) Circuits i) Series Circuit ii) Parallel circuit iii) Electric Power iv) Electric energy 3) Magnetism a) Magnetic Force b) Magnetic Field i) Direction ii) Magnetic Flux lines Flux density iii) Magnetic field around a straight conductor iv) Magnetic field around a coil of wire (solenoid) c) Force of a moving charge carrier in a magnetic field 4) Electromagnetic Induction a) Electromagnetic radiation; moving conductor and induced EMF			

Greater New York Academy of Seventh-day Adventists

Period	Unit	Topic	Material	Assignment	Assessment
First Semester Finals Jan 17-19 Covering Mechanics and Energy					
March 2-14	Wave Phenomena	1) Introduction to Waves a) Transfer of Energy b) Pulse and Periodic Waves i) Pulse in a medium (1) Speed of a pulse (2) Reflection and refraction ii) Periodic Waves c) Types of Wave motion i) Longitudinal waves ii) Transverse Waves 2) Characteristics of Periodic Waves a) Frequency b) Period c) Amplitude d) Phase e) Wavelength f) Speed g) Doppler effect h) Wave Propagation; wave fronts. 3) Periodic Wave Phenomena a) Interference i) Superposition (1) Constructive Interference	Student Edition (SE) Merrill Chap.	Selected Questions from the end of chapter. Study Guide Exercises for reinforcement. Transparency masters exercises.	Chapter test at the completion of each chapter. Lab

Greater New York Academy of Seventh-day Adventists

Period	Unit	Topic	Material	Assignment	Assessment
March 2-14		(2) Destructive interference ii) Two sources in phase in the same medium iii) Standing Waves (1) Reflection (2) Resonance 4) Light a) Speed i) In space ii) In a medium b) Reflection i) Law Reflection ii) Regular Reflection iii) Diffused Reflection c) Refraction i) Effect of a Medium ii) Speed of Refraction d) Absolute Index of Refraction i) Snell's Law ii) Critical angle iii) Total internal reflection iv) Dispersion v) Dispersive Medium vi) Non dispersive medium e) Wave Nature of Light i) Interference of Light (1) Diffraction (2) Coherent Light Sources			

Period	Unit	Topic	Material	Assignment	Assessment
March 2-14		(3) Double slit ii) Polarization f) Electromagnetic Spectrum			
March 14 – April 21	Modern Physics	1. Dual nature of Light a. Wave Phenomena b. Particle phenomena 2. The Quantum Theory a. The Quantum E = hf b. The Photon E = hc / lamda c. The Photo electric effect d. Photon particle collision e. Photon momentum p = h /lamda f. Matter waves 3. Models of the atom a. The Rutherford model b. The Bohr Model of the H atom; atom spectra c. The cloud model	Student Edition (SE) Merrill Chap. 29	Selected Questions from the end of chapter. Study Guide Exercises for reinforcement . Transparency masters exercises.	Chapter test at the completion of each chapter. Lab
May 2 – May 30	Optional Units	1. Motion in the Plane 2. Internal Energy 3. Nuclear Energy 4. Nuclear Reactions 5. Electromagnetic Applications 6. Geometrical Optics 7. Solid State Physics	Student Edition (SE) Merrill Chap.7,30-31,25	Selected Questions from the end of chapter. Study Guide Exercises for reinforcement . Transparency masters exercises.	Chapter test at the completion of each chapter. Lab

Greater New York Academy of Seventh-day Adventists

Period	Unit	Topic	Material	Assignment	Assessment

Second Semester Finals covering the total Syllabus – Regents Mock Exam

Grading System:

The Following System of marking and recording Grades will be used , Numerical equivalents are also indicated.

Letter	Percentage	Honor Points
A	93-100	4.00
A-	89-92	3.66
B+	86-88	3.33
B	83-85	3.00
B-	79-92	2.66
C+	76-78	2.33
C	73-75	2.00
C-	69-72	1.66
D+	66-68	1.33
D	63-65	1.00
F	62 or less	0.00

Please Refer to the 2005-2006 Bulletin re Attendance policy, dress code, computer policy .

God's Richest Blessing to you in all your scholastic endeavors for the academic year.

Class and School Theme –I can Do all Thing through Christ…