

DEPARTMENT: SCIENCE	COURSE TITLE: CONCEPTUAL PHYSICS COURSE NUMBER: 242
GRADE(S): 12 (WITH SOME EXCEPTIONS)	PRE-REQUISITES (IF ANY):

UNIT	LENGTH	CONTENT	SKILLS	METHODS OF ASSESSMENT	FRAMEWORK STRAND(S) & STANDARD(S)
Introduction: What is Physics	2 weeks	<ul style="list-style-type: none"> Survey of Physics topics: Mechanics, Heat, Light, Electricity & Magnetism 	Students will: <ul style="list-style-type: none"> Conduct print/non-print research. Give visual & oral presentations. 	<ul style="list-style-type: none"> Presentation 	
Motion I: Speed/velocity, distance and time	2 weeks	<ul style="list-style-type: none"> Relative motion Describing motion in terms of distance, speed and time Velocity vs. speed 	Students will: <ul style="list-style-type: none"> Design experiments. Collect and analyze data. Solve math problem ($s=d/t$). Construct and interpret graphs. Take measurements. Demonstrate computer skills. Use calculator. Demonstrate understanding of lab safety. 	<ul style="list-style-type: none"> Lab report Quiz Homework problems Quick write PRS Class work (participation) 	Motion and Forces: 1.1, 1.4, 1.12
Motion II: Accelerated Motion	2 weeks	<ul style="list-style-type: none"> Acceleration as a concept and mathematically as rate of change of velocity Free-fall and gravity Air resistance and terminal velocity 	Students will: <ul style="list-style-type: none"> Demonstrate problem solving abilities. Take measurements Make unit conversions. Make inferences. Formulate questions. Use computers (modeling/simulations). Work collaboratively. Practice lab safety. 	<ul style="list-style-type: none"> Homework/class work Quiz Quick write Concept map PRS Lab report Unit test 	Motion and Forces: 1.1, 1.3, 1.12
Newton's Laws (I)	1 week	<ul style="list-style-type: none"> Historical context Inertia Mass Weight 	Students will: <ul style="list-style-type: none"> Use the computer as a research tool. Make inferences. Formulating questions. Practice critical analysis. Work collaboratively. Practice lab safety. 	<ul style="list-style-type: none"> Lab report Quiz Homework questions Class participation Quick write Concept map PRS 	Motion and Forces: 1.5, 1.6, 1.12

Newton's Laws (II)	2 weeks	<ul style="list-style-type: none"> Relationship between force/weight, mass and acceleration Friction Pressure 	<p>Students will:</p> <ul style="list-style-type: none"> Demonstrate problem solving abilities. Make measurements Practice unit conversions. Make inferences. Formulate questions. Practice critical analysis. Do computer modeling/simulations. Practice lab safety. Construct and interpret graphs. Work collaboratively. 	<ul style="list-style-type: none"> Lab report Quiz Home and class work Class participation Quick write Concept map PRS 	Motion and Forces: 1.7, 1.8, 1.9, 1.12
Newton's Laws (III)	1 week	<ul style="list-style-type: none"> Identifying action-reaction force pairs Effect of mass on reaction force Normal force 	<p>Students will:</p> <ul style="list-style-type: none"> Demonstrate problem solving abilities. Make inferences. Develop possible solutions. Formulate questions. Practice critical analysis. Use computers for research and modeling. Work collaboratively. 	<ul style="list-style-type: none"> Quiz Home and class work problems Class participation Quick write Unit test—Newton's laws 	Motion and Forces: 1.10
Vectors	1 week	<ul style="list-style-type: none"> Vector and Scalar quantities Representations for displacement, velocity and force Addition of vectors Components of vectors Equilibrium Projectile motion 	<p>Students will:</p> <ul style="list-style-type: none"> Develop graphical analysis and representations (vectors). Take measurement. Demonstrate problem solving abilities. Work collaboratively. 	<ul style="list-style-type: none"> Home and class work Quiz Class participation Lab practical 	Motion and Forces: 1.1, 1.2
Momentum	1 week	<ul style="list-style-type: none"> Impulse and momentum Bouncing Collisions Conservation of momentum 	<p>Students will:</p> <ul style="list-style-type: none"> Demonstrate problem solving abilities. Work collaboratively. Use computers for simulations. Develop possible solutions. Use calculators. Write a report. 	<ul style="list-style-type: none"> Lab report Quiz Home and class work Class participation Quick write PRS 	Conservation of Momentum and Energy: 2.5, 2.6

Energy	2 weeks	<ul style="list-style-type: none"> • Work • Power • Mechanical energy • Potential and kinetic energy • Conservation of energy 	<p>Students will:</p> <ul style="list-style-type: none"> • Make measurements. • Demonstrate problem solving abilities. • Make unit conversions. • Develop possible solutions. • Formulate questions. • Practice critical analysis. • Practice lab safety skills. • Use computers for simulations. • Use calculators. • Work collaboratively. 	<ul style="list-style-type: none"> • Lab report • Quiz • Home and class work • Class participation • Quick write • Concept map 	Conservation of Momentum and Energy: 2.1, 2.2, 2.3, 2.4, 2.6
Universal Gravitation	1 week	<ul style="list-style-type: none"> • Acceleration due to gravity • Gravitational fields • Weight and weightlessness • Black holes 	<p>Students will:</p> <ul style="list-style-type: none"> • Demonstrate problem solving abilities. • Make inferences. • Develop possible solutions. • Formulate questions. • Practice critical analysis. • Use computers for simulations and research. • Work collaboratively. • Write a report. • Use calculators. 	<ul style="list-style-type: none"> • Home and class work problems • Quiz • Class participation • Quick write • Concept map • Oral presentation 	Motion and Forces: 1.11
Heat & Heat Transfer	2 weeks	<ul style="list-style-type: none"> • Temperature and heat • Specific heat • Thermal expansion of solids and liquids • Conduction, convection and radiation 	<p>Students will:</p> <ul style="list-style-type: none"> • Make measurements. • Demonstrate problem solving abilities. • Make unit conversions. • Use calculators. • Formulate questions • Work collaboratively. • Construct and interpret graphs. 	<ul style="list-style-type: none"> • Home and class work problems • Quiz • Class participation • Quick write • Concept map • Lab report 	Heat and Heat Transfer: 3.1, 3.2, 3.3
Waves, Sound and Light	2 weeks	<ul style="list-style-type: none"> • Transverse and longitudinal waves • Generation and characteristics • Sources of sound • Propagation • Speed, wavelength and frequency of sound waves • Natural frequency and resonance • Propagation of light • Shadows • Reflection • Refraction and color mixing 	<p>Students will:</p> <ul style="list-style-type: none"> • Demonstrate problem solving abilities. • Make inferences. • Develop possible solutions. • Design and analyze an experiment. • Use calculators. • Work collaboratively. • Use computers for simulations and research. 	<ul style="list-style-type: none"> • Home and class work problems • Quiz • Class participation • Quick write • Lab report • Test 	Waves: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.8, 4.9 Electromagnetic Radiation: 6.1, 6.2

Electricity & Magnetism	4 weeks	<ul style="list-style-type: none"> • Electrostatics • Sources and conversions (from/to) of electrical energy • Series and parallel circuits • Electronic circuits • Magnetism • Electromagnetism 	<p>Students will:</p> <ul style="list-style-type: none"> • Demonstrate problem solving abilities. • Make inferences. • Take measurements. • Develop possible solutions. • Make models. • Formulate questions. • Practice lab safety. • Use computers for research & simulations. • Use calculators. • Work collaboratively. 	<ul style="list-style-type: none"> • Home and class work problems • Quiz • Quick write • Lab practical • Concept map • Test 	Electro-magnetism 5.1, 5.2, 5.4, 5.5, 5.6
Final Project	1 week	<ul style="list-style-type: none"> • Synthesis and application of physics concepts studied throughout the course 	<p>Students will:</p> <ul style="list-style-type: none"> • Work in collaborative groups. • Practice critical analysis. • Making models. • Formulate questions. • Use computers for research. 	<ul style="list-style-type: none"> • Presentation—oral/visual aids and written 	
