AP PHYSICS
Course Syllabus

Course Number: STEM-0063

OCAS Code:
5215 AP Physics B
5216 AP Physics C--Mechanics
5217 AP Physics C--Electricity and Magnetism

Course Length: 120 Hours

Career Cluster: Science, Technology, Engineering and Mathematics

Career Pathway: Engineering and Technology

Career Major(s): Pre-Engineering Aerospace, Pre-Engineering Civil & Architecture, Pre-Engineering Mechanical, Biotechnology, PLTW Biomedical Science and Medicine

Pre-requisite(s): Biology I, Algebra I, Geometry, Pre-AP Algebra II, Pre-AP Trig./Calc.-Highly recommended.

Course Description:
CareerTech AP Physics is intended to be a rigorous course that is on the level of most college physics courses. Whether AP Physics B or AP Physics C is taught is up to the discretion of the individual CareerTech.

The following standard will cover the objectives of both with the understanding that the course direction is up to the CareerTech and their program needs.

CareerTech AP Physics B has a trigonometry emphasis. Five major content areas of physics will be taught. They are: mechanics, thermodynamics, waves and optics, electricity & magnetism, and modern physics. Students will be expected to sit for the AP exam at the completion of the course.

CareerTech AP Physics C expects the student to have knowledge of trigonometry and calculus. It is an analytical course that focuses on mechanics and electricity & magnetism.

CareerTech AP Physics C-Mechanics should provide instruction in each of the following content areas: kinematics, Newton's Laws of Motion, work, energy and power, systems of particles and linear momentum, circular motion and rotation, and oscillations and gravitation.

CareerTech AP Physics C-Electricity and Magnetism should provide instruction in each of the five content areas: electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. These subjects will be covered in depth with laboratory activities and lab reports an essential part of the coursework. Students will be expected to sit for the AP exam at the completion of the course.

Course Objectives:  

A. Students Will be Able to Understand and Apply the Following:  
1. Newtonian Mechanics  
2. Fluid Mechanics and Thermal Physics  
3. Electricity and Magnetism  
4. Waves and Optics  
5. Atomic and Nuclear Physics  

B. Students Will Perform the Following Suggested Labs/Activities  
1. Design physics experiments  
2. Measurements/error/graphs  
3. Adding forces/vectors  
4. Spreadsheets  
5. Mass/Volume/Density  
6. Position, velocity, acceleration  
7. Free fall  
8. Uniformly accelerated motion  
9. Projectile Motion  
10. Inclined Plane  
11. Ballistic Pendulum  
12. Hooke's Law  
13. Simple Pendulum  
14. Oscillation/Harmonic Motion  
15. Friction  
16. Atwood's Machine  
17. Forces  
18. Newton's Laws of Motion  
19. Centripetal Force/Circular Motion  
21. Momentum/Impulse  
22. Torque/Static Equilibrium  
23. Rotational Motion/Moment of Inertia  
24. Electrostatics  
25. Ohm's Law  
26. Resistance  
27. Equipotentials  
28. Series and Parallel Resistors  
29. DC Circuits  
30. Bridge Circuits  
31. Faraday's Law  
32. Ammeter/Voltmeter Measurements  
33. Diodes/Transistors  
34. RC Circuits  
35. AC Circuits  
36. Magnetic Fields  
37. Acceleration of Particles in fields  
38. Capacitors  
39. Ampere's Law  
40. Wave Labs (char. of waves, resonance, reflection, refraction, interference, diffraction)  
41. Mirrors/Lenses  
42. Geometric Optics  
43. Polarization  
44. Lasers  
45. Speed of Sound
Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.

Grading Procedures: 1. Students are graded on theory and lab practice and performance. 2. Each course must be passed with seventy (70%) percent or better. 3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

Available Certifications/College Credit: The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

College Credit Eligibility: The student must maintain a grade point average of 2.0 or better.