Warren County School District

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Advanced Physics Honors

Course Number: 00351

Course Prerequisites: Successful completion of the required Academic Physics

Course Description:

Advanced Physics is a one-year, one-credit honors course. Topics include: static and rotational equilibrium, rotational dynamics, fluid mechanics, electric fields, electric potential, electric circuits, and geometric optics.

Suggested Grade Level: 11 or 12

Length of Course: ____One Semester **X** Two Semesters _____Other (Describe)_____

Units of Credit: 1

PDE *Certification and Staffing Policies and Guidelines (CSPG)* Required Teacher Certification(s)
Physics 7-12

Certification verified by WCSD Human Resources Department:
X Yes ____No

Board Approved Textbooks, Software, Materials:
Title:
Publisher:
ISBN #:
Copyright Date:
Date of WCSD Board Approval:

BOARD APPROVAL:

Date Written: __November 2009____

Date Approved:_____

Implementation Year: 2010-2011

Suggested Supplemental Materials (List or insert **None**): None

Course Standards

PA Academic Standards: (List by Number and Description)

3.1.12 Unifying Themes

A. Apply concepts of systems, subsystems, feed back and control to solve complex technological problems.
B. Apply concepts of models as a method to predict and understand science and technology.
C. Assess and apply patterns in science and technology.
D. Analyze scale as a way of relating concepts and ideas to one another by some measure.
E. Evaluate change in nature, physical systems and man made systems.

3.2.12 Inquiry and Design

A. Evaluate the nature of scientific and technological knowledge.
B. Evaluate experimental information for appropriateness and adherence to relevant science processes.
C. Apply the elements of scientific inquiry to solve multi-step problems.
D. Analyze and use the technological design process to solve problems.

3.4.12 Physical Science, Chemistry and Physics

C. Apply the principals of motion and force.

3.7.12 Technological Devices

A. Apply advanced tools, materials and techniques to answer complex questions.
B. Evaluate appropriate instruments and apparatus to accurately measure materials and processes.

WCSD Academic Standards: None

Industry or Other Standards: None

WCSD EXPECTATIONS

WCSD K-12 Expectations for instruction in writing, reading, mathematics and, technology have been developed and revised annually. The teacher will integrate all WCSD Expectations into this planned instruction

SPECIAL EDUCATION AND GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (I.E.P.) or Gifted Individual Education Plan (G.I.E.P.).

PSSA Assessment Anchors Addressed: This course is written to the 12th grade standards. No assessment anchors have been written for this level.

Suggested Formative Assessments: The teacher will develop and use standards-based assessments throughout the course.

- Pre-Assessments of prior knowledge (e.g. entrance cards or KWL chart)
- Labs/lab reports
- Bell ringers/Problems of the Day(PODs)
- Discussions
- Teacher observation/Questioning
- Graphic organizers (e.g. Venn diagrams, word mapping, webbing, KWL chart, etc.)
- Summarizing
- Retelling
- Note taking
- Problem-based learning modules
- Authentic assessment
- Oral presentations
- Outlining
- Journaling
- Student presentations/projects
- Open-ended response
- Quizzes/tests
- Activities
- Classroom Performance System (CPS)
- White boards

Suggested Summative Assessments:

- Essays
- Open-Ended Responses
- Projects
- Quizzes/tests
- Student presentations
- Portfolios
- Lab Practical
- Lab Report

District Approved Assessment Instruments

- PSSA Tests-Grades 4, 8 and 11 only

Differentiated Instructional Assessment Strategies

Portfolio Assessment: Yes **X** No

District-wide Final Examination Required: ____ Yes **X** No

Course Challenge Assessment (Describe):

REQUIRED COURSE SEQUENCE AND TIMELINE

(Content must be tied to objectives)

Content Sequence	Dates
A. Equilibrium	**30 days**
1. Static	
2. Rotational	
B. Rotational mechanics	**30 days**
1. Rotational kinematics	
2. Rotational momentum	
C. Fluid mechanics	**30 days**
1. Fluid statics	
2. Fluid dynamics	
D. Thermodynamics	**30 days**
1. First Law	
2. Second Law	
3. Third Law	
4. Zeroth Law	
E. Electricity	**40 days**
1. Electrostatic forces	
2. Electrostatic energy	
3. Direct current	
4. Circuits	
F. Optics	**20 days**
1. Mirrors	
2. Lenses	
1. Spectroscopy	

Objectives:

A. Plan and conduct investigations, analyze and interpret data, and demonstrate scientific reasoning and logic as well as the use of models.
B. Apply physics to real world scenarios.
C. Investigate and understand the interrelationships among mass, distance, force and time.
D. Investigate and understand that quantities including, mass, energy, momentum, and charge are conserved.
E. Interpret wave phenomena and wave characteristics.

F. Diagram and construct basic electrical circuits and explain the functions of various circuit components.
G. Investigate and understand how to use the field concept to describe the effects of gravitational, electric, and magnetic forces.
I. Compare and contrast Newtonian physics and modern physics.

WRITING TEAM: Sarah Ambrose

WCSD STUDENT DATA SYSTEM INFORMATION

1. Is there a required final examination? **X** Yes ____ No
2. Does this course issue a mark/grade for the report card?

   X Yes____ No
3. Does this course issue a Pass/Fail mark? ____ Yes **X** No
4. Is the course mark/grade part of the GPA calculation?

   X Yes ____ No
5. Is the course eligible for Honor Roll calculation? **X** Yes ____ No
6. What is the academic weight of the course?

   ____ No weight/Non credit ____ Standard weight

   X Enhanced weight (Honors) as per current school board policy