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Ohio Articulation Number (OAN)
Course Submission Form
2005-2006

College/University Youngstown State University

Course(s) Submitted(Title & Course #) General Physics 1 for
Ohio Articulation Number OSC 016

Date 12/08/06 Course Phys. 2610 1 of 2 of a 2 Course OAN mapping.

Name and title of individual submitting on behalf of the college/university

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Credit Hours 4 qtr sem X
Lecture Hours 4
Laboratory Hours (if applicable)
Pre-Requisites(s) Course work : Phys 1501, Math 1571

Placement Score:

(Domain) (Score)

Catalog/Course Description (Includes Course Title and Course #)

2610. General Physic 1. A course in mechanics; the kinematics and dynamics of masses in translation and rotation; Newton's Laws; gravity; the conversation laws of energy and momentum; simple harmonic motion and introduction to wave motion and sound. Prereq.: High school physics or

PHYS 1501. Prereq. or concurrent: MATH 1571 4 S.H.
This is a resubmission. The previous submission lacked the weekly topics list. This list is now at the end of this submission under "Additional Documentation"

Texts/Outside Readings/Ancillary Materials

Physics for Scientists and Engineers, by R. Knight

Course Objectives and/or Plan of Work

This course is a General Education course in the Natural Science Domain and emphasizes General Education Goals. (2) Acquiring, processing and presenting quantitative and qualitative information using the most appropriate technologies, including computers. (3) Reasoning critically, drawing sound conclusions, and applying those conclusions to one's life and society. (6) Understanding the scientific method, forming and testing hypotheses as well as evaluating results. (7) Realizing the evolving relationships among science, technology, and society. (13) Understanding and appreciating the natural environment and the processes that shape it.

There are two main goals in Physics 2610. The first is a thorough introduction to the natural laws of classical mechanics (basic Newtonian physics). The second is the development of tools of applied mathematics for real problem solving. Together, the result will be an introduction to the scientific method in the physical sciences.

In keeping with the above goals, the following objectives will be realized: (1) a thorough mathematical description of motion (kinematics) in a straight line, in a plane (projectile motion), and motion in a curved path (uniform circular motion), (2) a discussion of the forces that give rise to these motions (Newton's three laws), (3) the concept of energy and its conservation, (4) an introduction to the concept of linear momentum and its conversation in collision problems, (5) rotational dynamics, and (6) waves and vibrations.

In accordance with University procedure, if you have a documented disability and require accommodations to obtain equal access in this course please contact me privately to discuss your specific needs. You must be registered with the Center for Student Progress (CSP)/Disability Services office located at Wick House (on the corner of Wick Avenue and the Access Road) and provide a letter of accommodation to verify your eligibility. You can reach the CSP/Disability Services at 330-941-1372.

Description of Assessment and/or Evaluation of Student Learning

Explanation and application of the following topics using calculus concepts and methods where appropriate:
1. Kinematics – one and two dimensional

2. Vectors – vector Arithmetic
3. Force and Newton's Laws of Motion
4. Work, Energy, Conservation of Energy
5. Linear momentum
6. Collisions
7. Rotational kinematics and dynamics
8. Angular momentum and rotational energy
9. Simple harmonic motion
10. Waves and sound

Master Syllabi and Working Syllabi (if both are used)

Physics 2610
General Physics 1

Text: Physics for Scientists and Engineers, R. Knight
Prereq: High School Physics or Physics 1501; Prereq. or Concurrent Math 1571

Syllabus

Chapter 1 – Concepts of Motion
Chapter 2 – Kinematics: The Mathematics of Motion
Chapter 3 – Vectors and Coordinate Systems
Chapter 4 – Force and Motion
Chapter 5 – Dynamics I: Motion Along a Line
Chapter 6 – Dynamics II: Motion in a Plane
Chapter 7 – Dynamics III: Motion in a Circle
Chapter 8 – Newton's Third Law
Chapter 9 – Impulse and Momentum
Chapter 10 – Energy
Chapter 11 – Work
Chapter 12 – Newton's Theory of Gravity
Chapter 13 – Rotation of a Rigid Body
Chapter 14 – Oscillations
Chapter 20 – Traveling Waves
Chapter 21 – Superposition

There will be three tests plus the Final. The first test will be on Wednesday, 28 September 2005, the second on Wednesday, 26 October, and the third on Monday, 28 November. The lowest of the three tests will be dropped. Each of the three remaining tests will be worth 20% of your grade for the course. The Final Exam, which will be comprehensive, will be on Monday, 12 December 2005, from 1030-1240 and is worth 40% of your grade. In addition, there will be at least 3 unannounced extra-credit quizzes, each worth 10 bonus points.

Attendance is mandatory only on exam dates, but it is strongly suggested that you attend every lecture. Please do not fall behind.

As discussed in the *Bulletin,* grades are assigned "on the basis of achievement in the subject matter of the course and in accordance with accepted professional standards. In Physics 2610, an A will usually mean an average of 85-100%, B = 70-84%, C = 55-69%, D = 40-54%, and F < 40%. The scale could be lowered but will not be raised.

Goals and Objectives

There are two main goals in Physics 2610. The first is a thorough introduction to the natural laws of classical mechanics (basic Newtonian physics). The second is the development of tools of applied mathematics for real problem solving. Together, the result will be an introduction to the scientific method in the physical sciences.

In keeping with the above goals, the following objectives will be realized: (1) a thorough mathematical description of motion (kinematics) in a straight line, in a plane (projectile motion), and motion in a curved path (uniform circular motion), (2) a discussion of the forces that give rise to these motions (Newton's three laws), (3) the concept of energy and its conservation, (4) an introduction to the concept of linear momentum and its conversation in collision problems, (5) rotational dynamics, land (6) waves and vibrations.

This course is a General Education course in the Natural Science Domain and emphasizes the following General Educations goals: This course is a General Education course in the Natural Science Domain and emphasizes General Education goals (2) acquiring, processing, and presenting quantitative and qualitative information using the most appropriate technologies, including computers; (3) reasoning critically, drawing sound conclusions, and applying those conclusions to one's live and society; (6) understanding the scientific method, forming and testing hypotheses as well as evaluating results; and (7) realizing the evolving relationships among science, technology, and society and (13) understanding and appreciating the natural environment and the processes that shape it.

Learning Outcomes:

1. Kinematics – one and two dimensional
2. Vectors – vector Arithmetic
3. Force and Newton's Laws of Motion
4. Work, Energy, Conservation of Energy
5. Linear momentum
6. Collisions
7. Rotational kinematics and dynamics
8. Angular momentum and rotational energy
9. Simple harmonic motion
10. Waves and sound

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Additional Documentation

Weekly Schedule of Topics:

Week 1 Motion diagrams, position and time, velocity, speed, acceleration, graphing motion

Week 2 Uniform motion, constant acceleration, free fall, instantaneous acceleration

Week 3 Vector algebra, scalars and vectors, vector components, relative velocities in two dimensions

Week 4 Force, Newton's Laws, free-body diagrams

Week 5 Equilibrium, applications of Newton's Laws, mass and weight, friction, drag

Week 6 Kinematics and dynamics in two dimensions, projectile motion,

Week 7 Uniform circular motion, accelerated circular motion, dynamics of circular motion, orbits, fictitious forces

Week 8 Applications of Newton's Third Law, rope and pulley problems

Week 9 Conservation Laws, momentum, impulse, elastic and inelastic collisions, momentum in two dimensions, angular momentum

Week 10 Energy, kinetic energy, potential energy, Hooke's Law, energy diagrams, gravitational potential energy

Week 11 Work and energy, force and work, variable force and work, power, thermal energy

Week 12 Newton's Universal Law of Gravitation, satellites and orbits

Week 13 Rotational dynamics, torque, rotational energy, rotational collisions, center of mass

Week 14 Simple harmonic oscillator, pendulum, driven oscillations

Week 15 Huygen's wave model, one-dimensional waves, sound and light, power and intensity, superposition, standing waves, interference, beats

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Additional Information Requested	
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