

OBR	
Received(time)	
Date	

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



College/University Youngstown State University

Course(s) Submitted(Title & Course #) Fundamentals of Physics 1 for  
Ohio Articulation Number OSC 014

Date 5/19/06 Course Phys. 1501 of a 1 of 2 Course OAN mapping.

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

Name William Sturuss Title Chair Department of Physics & Astronomy

Address One University Plaza,  
Youngstown, OH 44555

E-mail wsturuss@cc.ysu.edu

Phone 330-941-7113

Fax 330-941-3121

Credit Hours 4 qtr \_\_\_\_\_ sem X

Lecture Hours 4

Laboratory Hours \_\_\_\_\_ (if applicable)

Pre-Requisites(s) Course work : Math 1504

Placement Score: 4

(Name of test ACT

Compass ESL

Placement Test

(Domain) \_\_\_\_\_ (Score) \_\_\_\_\_

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

1501. Fundamentals of Physics 1. Topics include kinematics, forces energy, momentum, rotational kinematics, torque, angular momentum, simple harmonic motion, and mechanical waves. Not recommended for
---

Mathematics, Chemistry, Physics or Engineering majors. Prereq: MATH 1504 or equivalent high school algebra and trigonometry or a 4 on the Math Placement Test 4 S.H.

Texts/Outside Readings/Ancillary Materials

*College Physics*, 2<sup>nd</sup> ed. By Giambattista, et al

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 the and appreciating the natural environment and the processes that shape it. Goals to include student mastery of basic physical principles and development by experience in critical thinking and problem solving techniques and in application of the scientific methods.

Description of Assessment and/or Evaluation of Student Learning

Understanding and/application of the following topics using algebra and trigonometry 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
11. Solid and fluid properties

Master Syllabi and Working Syllabi (if both are used)

## SYLLABUS – Physics 1501

### FUNDAMENTALS OF PHYSICS 1

**Text:** *College Physics*, Giambattista, et al (2<sup>nd</sup> edition)

**Prereq.:** Math 1504 or equivalent high school algebra and trigonometry or a Score of 4 on the Math Placement Test

We will cover 12 chapters (Ch. 1-12) in 15 weeks of classes (excluding Spring Break). In mid March, April, and May there will be term tests as noted below, each to count for approximately 1/5 of the final grade. The rest of the grade will be based on the final, about half of which will be on Ch. 11-12, the remainder on Ch. 1-10.

Homework will be assigned, and as I deem necessary, collected. *It is strongly recommended that you do the homework diligently*, as it will help you master the concepts and techniques of physics, which is what this course is all about, and prepare you for the tests you must take in order to demonstrate this mastery.

Grading Scale: 90-100% = A 80-89% = B 70-79% = C 60-69% = D 59 or lower = F  
TENTATIVE SCHEDULE BELOW:

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; 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. Goals to include student mastery of basic physical principles and development by experience in critical thinking and problem solving techniques and in application of the scientific methods. Understanding and/application of the following topics using calculus concepts and methods where appropriate:

#### 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
11. Solid and fluid properties

---

**In accordance with the University procedures, 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 Disability Services Office in Wick House and provide a letter of accommodation to verify your eligibility. You can reach the Disability Services Office at 330-941-1372.**

Youngstown State University  
PHYS 1501 Course Topics  
Introductory Algebra/Trigonometry Sequence

Week 1:

(Ch 1) Science & Creativity; Physics and its relation to other fields; Models, theories, and laws; Measurement and uncertainty; Units, standards, and the SI system; Converting units; Order of magnitude estimating; Mathematics in physics; (2) Reference frames and displacement; Average velocity; Instantaneous velocity;

Week 2:

Acceleration; Motion with constant acceleration; Solving problems; Falling objects (3) Vectors and scalars; Addition of vectors-graphical methods; Subtraction of vectors; Multiplication of a vector by a scalar;

Week 3:

Adding vectors by components; Projectile motion; Solving problems in projectile motion Parabolic motion; Relative velocity; (4) Force; Newton's first law of motion;

Week 4:

Mass; Newton's second law of motion; Newton's third law of motion; Weight, gravity and the normal force; Problem solving with Newton's laws; Applications involving friction and inclines

Week 5:

(5) Kinematics of uniform circular motion; Dynamics of uniform circular motion; Cars rounding curves; Non-uniform circular motion; Centrifugation

Week 6:

Newton's law of universal gravitation; Gravity near earth's surface; Satellites and weightlessness; Kepler's laws; Types of forces in nature (6) Work for a constant force; Work for a varying force

Week 7:

Kinetic energy and the work-energy theorem; Potential energy; Conservative and non-conservative forces; Mechanical energy and its conservation; Problem solving using conservation for mechanical energy; Energy transformations and conservation of energy; Energy conservation with dissipative forces; Power

Week 8:

(7) Momentum and force; Conservation of momentum; Collisions and impulse; Conservation of momentum and energy in collisions; Elastic collisions in one dimension; Inelastic collisions; Collisions in two dimensions

Week 9:

Center of mass; Center of mass for a human body; Center of mass and translational motion; (8) Angular quantities

Week 10:

Kinematic equations for uniformly accelerated circular motion; Rolling motion; Torque;

Rotational dynamics; Torque and rotational inertia; Problem solving in rotational dynamics; Rotational kinetic energy; Angular momentum and angular momentum conservation; Vector nature of angular quantities

Week 11:

(9) Statics and forces in equilibrium; Conditions of equilibrium; Problem solving in statics; Stability and balance; Elasticity

Week 12:

Stress and strain; fracture; (11) Simple harmonic motion; Energy for the simple harmonic oscillator; Period of simple harmonic motion; Simple pendulum; Damped harmonic motion; Resonance

Week 13:

Wave motion; Types of waves; Energy transported by waves; Intensity, amplitude and frequency of waves; Reflection and interference of waves; Standing waves and resonance; Refraction and diffraction (12) Characteristics of sound; Intensity and sound level; Amplitude of sound and intensity; Response of human ear

Week 14:

Vibrating strings and air columns; Quality of sound; Interference of sound waves and beats; Doppler effect; Shock waves; Applications of sound; (10) Density and specific gravity; Pressure in fluids; Atmospheric and gauge pressure

Week 15:

Pascal's principle; Barometer; Fluids in motion and the equation of continuity; Bernoulli's equation; Applications

Additional Documentation

--

OBR Use

Action

Approved	
Additional Information Requested	
Rejected	
Date	