

# PHYSICS (PHYS)

## PHYS A110 3 Units (54 lecture hours)

### Conceptual Physics

**Advisory:** MATH A010 and MATH A020.

**Grading Mode:** Standard Letter, Pass/No Pass

**Transfer Credit:** CSU; UC: Credit Limitation: No credit for PHYS A110, PHYS A111 if taken after PHYS A120, PHYS A130 or PHYS A185.

A brief, but complete presentation of the fundamental phenomena and laws in physics, with experimental illustrations, enhancing the development of conceptual scientific thinking. This course may also be offered online. Graded or Pass/No Pass option.

## PHYS A111 1 Unit (54 lab hours)

### Introductory Physics Laboratory

**Prerequisite(s):** PHYS A110 or concurrent enrollment.

**Grading Mode:** Standard Letter, Pass/No Pass

**Transfer Credit:** CSU; UC: Credit Limitation: No credit for PHYS A110, PHYS A111 if taken after PHYS A120, PHYS A130 or PHYS A185.

Introductory physics laboratory to complement PHYS A110. Not open to those who hold credit for any other physics laboratory course. Graded or Pass/No Pass option.

## PHYS A120 4 Units (72 lecture hours; 36 lab hours)

### Algebra Based Physics: Mechanics

**Prerequisite(s):** MATH A120, MATH A170, MATH A180, MATH A180H, or MATH A182H or concurrent enrollment.

**Grading Mode:** Standard Letter, Pass/No Pass

**Transfer Credit:** CSU; UC: Credit Limitation: PHYS A120, PHYS A125, PHYS A130, PHYS A135 and PHYS A185, PHYS A280, PHYS A285 combined: maximum credit, 1 series.

The first semester of a two-semester sequence (with PHYS A125) covering all topics in basic physics. Requires algebra and trigonometry. Satisfies the requirements for biological sciences and technical programs except physics, chemistry, and engineering. Graded or Pass/No Pass option. **C-ID:** PHYS 105.

## PHYS A125 4 Units (72 lecture hours; 36 lab hours)

### Algebra Based Physics: Electricity/Magnetism

**Prerequisite(s):** PHYS A120.

**Grading Mode:** Standard Letter, Pass/No Pass

**Transfer Credit:** CSU; UC: Credit Limitation: PHYS A120, PHYS A125, PHYS A130, PHYS A135 and PHYS A185, PHYS A280, PHYS A285 combined: maximum credit, 1 series.

The second semester of a two-semester sequence (with PHYS A120) covering all topics in basic physics. Requires algebra and trigonometry. Satisfies the requirements for biological sciences and technical programs except physics, chemistry, and engineering. Graded or Pass/No Pass option. **C-ID:** PHYS 110.

## PHYS A130 4 Units (72 lecture hours; 54 lab hours)

### University Physics 1 (non-majors)

**Prerequisite(s):** MATH A185 or MATH A185H or MATH A182H or concurrent enrollment.

**Grading Mode:** Standard Letter

**Transfer Credit:** CSU; UC: Credit Limitation: PHYS A120, PHYS A125, PHYS A130, PHYS A135 and PHYS A185, PHYS A280, PHYS A285 combined: maximum credit, 1 series.

AA study of general principles of mechanics, waves, and thermodynamics. Emphasis will be on Newton's three laws of motion, theory of gravity, conservation laws, laws of thermodynamics, generation and propagation of mechanical waves. The first semester of a two-semester sequence (with PHYS A135) requiring calculus.

## PHYS A135 4 Units (72 lecture hours; 54 lab hours)

### University Physics 2 (non-majors)

**Prerequisite(s):** PHYS A130; and Calculus 1 and 2 completed as MATH A182H only or both MATH A180 or MATH A180H, and MATH A185 or MATH A185H.

**Grading Mode:** Standard Letter

**Transfer Credit:** CSU; UC: Credit Limitation: PHYS A120, PHYS A125, PHYS A130, PHYS A135 and PHYS A185, PHYS A280, PHYS A285 combined: maximum credit, 1 series.

A study of general principles of electricity, electromagnetism, optics, theory of relativity, and quantum theory with applications to atoms, nuclei and elementary particles.

## PHYS A185 4 Units (72 lecture hours; 54 lab hours)

### Calculus Based Physics: Mechanics

**Prerequisite(s):** MATH A180 or MATH A180H, and MATH A185 or MATH A185H or concurrent enrollment; or MATH A182H or concurrent enrollment.

**Advisory:** One year of high school physics or a semester of college physics.

**Grading Mode:** Standard Letter

**Transfer Credit:** CSU; UC: Credit Limitation: PHYS A120, PHYS A125, PHYS A130, PHYS A135 and PHYS A185, PHYS A280, PHYS A285 combined: maximum credit, 1 series.

The PHYS A185, PHYS A280, PHYS A285 sequence is required for students planning to major in physics, chemistry or engineering. Newton's laws of motion, dynamics of particles in a given force field. gravitation, conservation laws of energy, momentum, angular momentum, and the kinematics of rigid body rotation. Propagation of mechanical waves in different elastic medium, waves on the string, water waves, sound waves. **C-ID:** PHYS 205.

**PHYS A185H 4 Units (72 lecture hours; 54 lab hours; 0 other hours)**

**Calculus-Based Physics: Mechanics Honors**

**Prerequisite(s):** MATH A180 or MATH A180H, and MATH A185 or MATH A185H or concurrent enrollment; or MATH A182H or concurrent enrollment.

**Advisory:** One year of high school physics or a semester of college physics.

**Grading Mode:** Standard Letter

**Transfer Credit:** CSU; UC: Credit Limitation: PHYS A120, PHYS A125, PHYS A130, PHYS A135 and PHYS A185, PHYS A280, PHYS A285 combined: maximum credit, 1 series.

The PHYS A185, PHYS A280, PHYS A285 sequence is required for students planning to major in physics, chemistry or engineering. Newton's laws of motion, dynamics, gravitation, energy, momentum, angular momentum, the kinematics of rigid body rotation, fluids, oscillations and waves. **C-ID:** PHYS 205.

**PHYS A280 4 Units (72 lecture hours; 54 lab hours)**

**Calculus Based Physics: Electricity/Magnetism**

**Prerequisite(s):** PHYS A185; and Calculus 1 and 2 completed as MATH A182H only or both MATH A180 or MATH A180H and MATH A185 or MATH A185H.

**Grading Mode:** Standard Letter

**Transfer Credit:** CSU; UC: Credit Limitation: PHYS A120, PHYS A125, PHYS A130, PHYS A135 and PHYS A185, PHYS A280, PHYS A285 combined: maximum credit, 1 series.

Continuation of PHYS A185. Coulomb's law, electrostatics fields, conductors and insulators. Gauss's law and electromagnetic fields. Magnetic fields and Ampere's law. Faraday's law of induction and Maxwell's equations of electromagnetic fields. Electromagnetic energy transfer by means of cables, transmission lines and transparent media. Four hours lecture, three hours laboratory. **C-ID:** PHYS 210.

**PHYS A285 4 Units (72 lecture hours; 54 lab hours)**

**Calculus Based Physics: Modern**

**Prerequisite(s):** PHYS A185.

**Grading Mode:** Standard Letter

**Transfer Credit:** CSU; UC: Credit Limitation: PHYS A120, PHYS A125, PHYS A130, PHYS A135 and PHYS A185, PHYS A280, PHYS A285 combined: maximum credit, 1 series.

Heat, Light, Modern Physics. The dynamics of the transformation of thermal energy into mechanical work, heat engines, heat pumps and refrigerators. Light laws viewed in terms of geometric optics and physical optics. The relevance of special theory of relativity to modern physics. Introduction to quantum mechanics. **C-ID:** PHYS 215.