

# PHY - PHYSICS

## PHY 1034 The Physics of Sound and Music (GE) (3 Units)

An introduction to the science of sound, hearing and music. The course will focus on concepts of sound production, propagation, and perception including topics such as musical scales, instruments, and acoustics.

Letter grade.

**Pre or Corequisite(s):** MTH 0099 or equivalent.

**Corequisite(s):** PHY 1034L

**Fee:** Course fee applies. See "Special Fees" in Financing a PLNU Education.  
(GELO1E)

## PHY 1034L The Physics of Sound and Music Lab (GE) (1 Unit)

A lab course designed for a hands-on exploration of The Physics of Sound and Music. Meets two hours per week.

Letter grade.

**Corequisite(s):** PHY 1034  
(GELO1E)

## PHY 1044 General Physics I (GE) (3 Units)

A general introduction to physics including mechanics, thermodynamics, waves and sound. The course is taught primarily at the algebra/trigonometry level but does require limited use of calculus.

Meets the professional requirements of life and medical science majors.  
Letter grade.

**Prerequisite(s):** MTH 1033

**Corequisite(s):** PHY 1044L

**Fee:** Course fee applies. See "Special Fees" in Financing a PLNU Education.  
(GELO1E)

## PHY 1044L General Physics I Lab (GE) (1 Unit)

A lab course designed for a hands-on exploration of General Physics I. Meets two hours per week.

Letter grade.

**Prerequisite(s):** MTH 1033

**Corequisite(s):** PHY 1044  
(GELO1E)

## PHY 1054 General Physics II (GE) (3 Units)

A general introduction to physics including electricity and magnetism, optics, and modern physics. The course is taught primarily at the algebra/trigonometry level but does require limited use of calculus.

Meets the professional requirements of life and medical science majors.  
Letter grade.

**Prerequisite(s):** PHY 1044 with a grade of C- or higher or consent of instructor.

**Corequisite(s):** PHY 1054L

**Fee:** Course fee applies. See "Special Fees" in Financing a PLNU Education.

## PHY 1054L General Physics II Lab (GE) (1 Unit)

A lab course designed for a hands-on exploration of General Physics II. Meets two hours per week.

Letter grade.

**Prerequisite(s):** PHY 1044 with a grade of C- or higher or consent of instructor.

**Corequisite(s):** PHY 1054

## PHY 2044 University Physics I (GE) (3 Units)

An analytic, calculus-based study of classical physics appropriate for science and engineering majors. Includes mechanics, waves, and thermodynamics.

Letter grade.

**Corequisite(s):** MTH 1044 or MTH 1064 or consent of instructor and PHY 2044L.

**Fee:** Course fee applies. See "Special Fees" in Financing a PLNU Education.  
(GELO1E)

## PHY 2044L University Physics I Lab (GE) (1 Unit)

A lab course designed for a hands-on exploration of University Physics I. Meets three hours per week. Letter grade.

**Corequisite(s):** MTH 1044 or MTH 1064 or consent of instructor and PHY 2044L.  
(GELO1E)

## PHY 2054 University Physics II (3 Units)

An analytic, calculus-based study of classical physics appropriate for science and engineering majors with an emphasis on electromagnetism, circuits, and optics.

Letter grade.

**Prerequisite(s):** PHY 2044 with a grade of C- or higher.

**Corequisite(s):** MTH 1074 or consent of instructor and PHY 2054L.

**Fee:** Course fee applies. See "Special Fees" in Financing a PLNU Education.

## PHY 2054L University Physics II Lab (1 Unit)

A lab course designed for a hands-on exploration of University Physics II. Meets three hours per week. Letter grade.

**Prerequisite(s):** PHY 2044 with a grade of C- or higher.

**Corequisite(s):** MTH 1074 or consent of instructor and PHY 2054.

## PHY 3003 Modern Physics (2 Units)

An introduction to concepts of modern physics including relativity, quantum theory, atomic physics, and high energy physics.

Letter grade.

**Prerequisite(s):** PHY 1054 with a grade of C- or higher or PHY 2054 with a grade of C- or higher.

**Corequisite(s):** PHY 3003L

## PHY 3003L Modern Physics Lab (1 Unit)

A lab course designed for a hands-on exploration of Modern Physics. Meets three hours per week. Letter grade.

**Prerequisite(s):** PHY 1054 with a grade of C- or higher or PHY 2054 with a grade of C- or higher.

**Corequisite(s):** PHY 3003

**Fee:** Course fee applies. See "Special Fees" in Financing a PLNU Education.

## PHY 3043 Analytical Mechanics: Dynamics (3 Units)

Newtonian mechanics, dynamics of particles and rigid bodies, oscillatory motion, central forces, inertial tensors, Lagrangian and Hamiltonian formulations.

Letter grade.

Also offered as EGR 3043.

**Prerequisite(s):** MTH 3033 with a grade of C- or higher and PHY 2054 with a grade of C- or higher.

**PHY 3062 Electricity, Magnetism, and Waves I (2 Units)**

Classical electromagnetism including topics in electrostatics, magnetostatics, fields in matter, electromagnetic induction, and Maxwell's equations.

Letter grade.

Also offered as EGR 3062.

**Prerequisite(s):** MTH 2074 and PHY 2054 with a grade of C- or higher.

**Recommended:** MTH 3033

**PHY 3083 Electricity, Magnetism, and Waves II (3 Units)**

Electrodynamics with an emphasis on application of Maxwell's equations particularly to electromagnetic radiation.

Letter grade.

Also offered as EGR 3083.

**Prerequisite(s):** EGR 3062 or PHY 3062

**PHY 4013 Thermodynamics (3 Units)**

Fundamental concepts of thermodynamics and statistical mechanics; applications to both classical and quantum systems.

Letter grade.

Also offered as EGR 4013.

**Prerequisite(s):** PHY 2054

**Corequisite(s):** MTH 3033

**PHY 4053 Quantum Mechanics (3 Units)**

A rigorous introduction to quantum physics including Schroedinger's equation, matrix mechanics, perturbation theory, and applications in atomic and molecular physics.

Letter grade.

**Prerequisite(s):** MTH 2074 with a grade of C- or higher and PHY 3003.

**Recommended:** MTH 3033

**PHY 4063 Solid State Engineering (3 Units)**

An introduction to solid state engineering, including crystal structures, electron band theory, thermal properties, semiconductors, superconductors, nanostructures, nanofabrication, and devices.

Letter grade.

Also offered as EGR 4063.

**Prerequisite(s):** PHY 2054 with a grade of C- or higher.

**PHY 4072 Senior Project I (2 Units)**

This course provides students (teams with) the opportunity to design and build a prototype of a project. The students will give an oral presentation of their project in a design review setting. This course will normally be completed in a student's senior year.

Letter grade.

**Prerequisite(s):** Consent of instructor.

**Fee:** Course fee applies. See "Special Fees" in Financing a PLNU Education.

**PHY 4082 Senior Project II (2 Units)**

This course provides students (teams with) the opportunity to hone and finish building the project design initiated in PHY 4072. The students will prepare a scientific paper about their project and give an oral presentation of their findings. This course will normally be completed in a student's senior year.

Letter grade.

**Prerequisite(s):** PHY 4072 or consent of instructor.

**Fee:** Course fee applies. See "Special Fees" in Financing a PLNU Education.

**PHY 4090 Special Topics in Physics (1-3 Units)**

The topics in physics chosen depend on regular or visiting faculty expertise as well as student demand.

May be repeated up to a total of six (6) units as long as content is different.

**Prerequisite(s):** Consent of instructor.

**PHY 4092 Internship in Physics (2 Units)**

A supervised experience in which the student works with industry professionals to gain experience in physics or engineering.

May be repeated up to a total of four (4) units. Credit/No Credit.

**Prerequisite(s):** Student must have taken at least two upper-division engineering or physics classes and consent of instructor.

"C" Designation is for California Internships. "E" Designation is for Out of State Internships.

**PHY 4099 Independent Studies in Physics (1-4 Units)**

Independent investigation, under the supervision of a faculty member, of a specific problem in physics or engineering.

**Prerequisite(s):** Consent of instructor and department chair.