

# PHYSICS (PHYS)

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## PHYS 102 First Year Seminar

This is a discussion-based course that introduces students to the physics major. Topics of discussion can include physics career possibilities, tools to be a successful physics major, historical and philosophical aspects of physics, and the latest research tendencies in physics. Topics may vary based on student interests. This course is also an opportunity for faculty across the physics program to introduce themselves and their research to new physics majors. Credit/No Credit only. Not challengeable.

**Semester Hours:** 1

## PHYS 105 Introduction to Physics

Basic principles, history, and applications of physics. A minimum of mathematics used. Not for Physics majors.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 4

## PHYS 201 General Physics I

**Prerequisite:** Completion of MATH 105, MATH 201, or MATH 202  
Mechanics, wave motion, and heat. Lab included.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 5

## PHYS 202 General Physics II

**Prerequisite:** Completion of PHYS 201

Continuation of 201. Electricity and magnetism, optics, and modern physics. Lab included.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 5

## PHYS 203 Physics I: Mechanics

**Prerequisite:** Completion of MATH 201, MATH 202, MATH 311, or Maple Math Test B with a minimum score of 20 or Guided/Directed Math Placement with a minimum score of 50  
Calculus-based physics. Mechanics, wave motion, and thermodynamics. Lab included.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 5

## PHYS 204 Physics II: Electricity & Magnetism

**Prerequisite:** Completion of PHYS 201 or PHYS 203  
Completion of or concurrent enrollment in MATH 202. Calculus-based physics; electricity and magnetism, optics, and modern physics. Lab included.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 5

## PHYS 230 Astronomy

Planets and solar systems; types and characteristics of stars; our galaxy and its relation to the visible universe. Lab included. GEPS-L

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 5

## PHYS 303 Energy Issues

Introduces energy concepts, resources, technologies, planning, and related environmental and chemical topics. Includes heat and electricity, chemical production, solar energy, photochemical smog, water and waste treatment, recycling, greenhouse effect, and population. Also NASC 303 and PHYS 303. Not challengeable.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 4

## PHYS 322 Electricity and Magnetism

**Prerequisite:** Completion of MATH 202 AND PHYS 202 or PHYS 204  
Theory of electric and magnetic fields, current electricity, electromagnetic waves, and Maxwell's equations at an intermediate level.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 4

## PHYS 342 Analytical Mechanics

**Prerequisite:** Completion of MATH 202 AND PHYS 201 or PHYS 203  
Topics from Newtonian mechanics, using vector methods and introduction to Lagrange formulation. Problem solving emphasized. Also MATH 342.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 4

## PHYS 350 Optics

**Prerequisite:** Completion of MATH 202 AND PHYS 202 or PHYS 204  
Principles of physical optics at an intermediate level. Includes diffraction, interference polarization, and some geometrical optics. Lab.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 4

## PHYS 360 Modern Physics

**Prerequisite:** Completion of MATH 202 AND PHYS 202 or PHYS 204  
Introduces modern physics: special relativity, atomic structure, quantum theory, the solid state, and the nucleus. Lab included

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 5

## PHYS 365 Astrophysics

**Prerequisite:** Completion of MATH 202 and PHYS 204  
Introduction to modern astrophysics for physicists. Covers fundamentals of celestial mechanics, relativity, stellar spectra, galaxy dynamics and cosmology.

**Semester Hours:** 4

## PHYS 368 Quantum Mechanics

**Prerequisite:** Completion of MATH 202 AND PHYS 202 or PHYS 204  
Introduces quantum systems, using the Schrodinger equation, operators, and Dirac notation.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 4

## PHYS 370 Statistical and Thermal Physics

**Prerequisite:** Completion of MATH 202 and PHYS 204  
Introductions to statistical and thermal physics for physicists. Covers first and second laws of thermodynamics, entropy, heat engines and refrigerators, and quantum statistics.

**Grade Mode:** Letter, Credit/No Credit

**Semester Hours:** 4

**PHYS 380 Solid State Physics**

**Prerequisite:** Completion of MATH 202 and PHYS 204

Introduction to solid state physics. Covers crystals, reciprocal lattices, phonons, semi-conductors, metals and magnetism.

**Grade Mode:** Letter, Credit/No Credit

**Semester Hours:** 4

**PHYS 390 Physics Seminar**

This course consists of attendance and participation in weekly meetings and seminars. Topics include: research methods, literature review, and career and graduate school opportunities. Students will be guided through the process of selecting a senior project, conducting relevant literature searches and preparing a senior project proposal. Students will participate in a journal club in which they find a research article to review and present to the class. Credit/no credit only.

**Semester Hours:** 2

**PHYS 395 Advanced Physics Laboratory**

This is a project based course in which students work to design, construct, and implement an advanced physics experiment. At the end of the course, students will produce a research paper and give an oral presentation on their research. Letter grade only. Not challengeable. May be taken a total of twice for credit.

**Semester Hours:** 2,4

**PHYS 399 Independent Study**

Student-designed courses approved by a faculty member. Prior approval of goals, objectives, procedures, and assessment plan as directed in the Independent Study Manual is required. May be taken multiple times with a different topic for credit. Not challengeable.

**Grade Mode:** Letter, Credit/No Credit, Audit

**Semester Hours:** 1-4

**PHYS 409 Selected Topics in Physics**

**Prerequisite:** Completion of MATH 202 AND PHYS 202 or PHYS 204

Topics not covered in other courses. May be taken twice for credit. May be taken for letter grade only. Not challengeable.

**Grade Mode:** Letter, Letter, Audit

**Semester Hours:** 2,4

**PHYS 499 Senior Project/Seminar**

Culminating activity required by majors in all departments. Papers/theses/projects researched, prepared, and written under the guidance of a faculty member. Comprehensive exams or recitals required in some departments. Academically, Students must be in Good Standing to enroll in 499. Can be taken for letter grade only. Not challengeable.

**Semester Hours:** 4