

PHYSICS

Professors Bandyopadhyay, Dunn, and Rolleigh (chair)
Associate Professor Wright

MAJOR

13 courses distributed as follows:

Physics (8)

- PHYS 210 *General Physics I*
 or
 PHYS 230 *General Physics I (Calculus-based)*
- PHYS 220 *General Physics II*
 or
 PHYS 240 *General Physics II (Calculus-based)*
- PHYS 305 *Vibrations and Waves*
- PHYS 315 *Modern Physics*
- PHYS 340 *Electronics*
 or
 PHYS 350 *Advanced Experimental Laboratory*
- three courses selected from
 - PHYS 320 *Electrodynamics*
 - PHYS 330 *Quantum Mechanics*
 - PHYS 370 *Thermodynamics*
 - PHYS 380 *Classical Mechanics*

Mathematics (3)

- MATH 130 *Calculus I*
- MATH 140 *Calculus II*
- MATH 260 *Differential Equations*

Chemistry (2)

- CHEM 110 *General Chemistry I: Chemical Structure and Properties*
- CHEM 120 *General Chemistry II: Chemical Analysis and Reactivity*

Students planning a career in physics or engineering should take all four of PHYS 320, 330, 370, and 380. PHYS 49X, MATH 270, and CSCI 150 are useful preparation for graduate study in physics or engineering. All physics majors should do a research project while at Hendrix. Consult with any physics faculty member about research opportunities.

Senior Capstone Experience

The Senior Capstone Experience for the physics major consists of a comprehensive examination and an oral presentation of a research project or independent study. Students have two options for the examination. They may either take a national standardized examination (Advanced Physics Graduate Record Examination), or they may take a departmentally-designed examination, for which the student studies a set of questions for two hours, and then delivers a written response to a selection of questions. The grade for the Senior Capstone Experience is based on the examination.

MINOR

- PHYS 210 *General Physics I*
or
PHYS 230 *General Physics I (Calculus-based)*
- PHYS 220 *General Physics II*
or
PHYS 240 *General Physics II (Calculus-based)*
- PHYS 305 *Vibrations and Waves*
- PHYS 315 *Modern Physics*
- MATH 130 *Calculus I*
- MATH 140 *Calculus II*
- MATH 260 *Differential Equations*

Courses

PHYS 110 *Concepts of Space, Time, and Reality* (NS-L)

A conceptual study of the implications of modern physics on how we view space, time, and reality. Includes an introduction to the ideas of relativity and quantum physics. Two hours lecture, two hours lab.

PHYS 135 *Robotics Exploration Studio* (NS-L)

Introduction to mechanical design and computer programming in the context of building and programming mobile robots. Mechanical design topics will include vectors and forces, Newton's Laws, gears, motors, rotational motion, friction, and the design process. Computer science topics will include an introduction to programming, the programming of sensors and motors, and an introduction to artificial intelligence. Other topics include application of scientific method, teamwork skills, technical writing, and the relationship between the science fiction portrayal of robots and current technological reality. Cross-listed as CSCI 135 Robotics Exploration Studio (NS-L).

PHYS 160 *Astronomy* (NS)

A study of the structure and evolution of the universe. Topics include how astronomers observe and interpret phenomena, models of the solar system, life cycle of stars, and current models of the universe.

PHYS 210 *General Physics I* (QS, NS-L)

Mechanics, heat, and sound. Laboratory course. Calculus not required.

PHYS 220 *General Physics II* (QS, NS-L)

Electricity, magnetism, and optics. Laboratory course. *Prerequisite:* PHYS 210.

PHYS 230 *General Physics I (Calculus-based)* (QS, NS-L)

Mechanics, heat, and waves. Laboratory course. Co-requisite: MATH 130.

PHYS 240 *General Physics II (Calculus-based)* (QS, NS-L)

Electricity, magnetism, and optics. Laboratory course. *Prerequisites:* PHYS 210 or 230, and MATH 130. *Co-requisite:* MATH 140 or consent.

PHYS 305 *Vibrations and Waves* (QS, NS)

Mechanical and electromagnetic waves. Fourier analysis and vector calculus. *Prerequisite:* PHYS 240. *Co-requisite:* MATH 240.

PHYS 315 *Modern Physics* (QS, NS-L, W2)

Phenomenological basis of atomic and subatomic physics. Laboratory course. Cross-listed as CHEM 410 Advanced Physical Chemistry. Prerequisite: PHYS 305.

PHYS 320 *Electrodynamics*

Electrostatics, electromagnetic fields, currents, and Maxwell's equations. Prerequisite: PHYS 305.

PHYS 330 *Quantum Mechanics*

Mathematical formalism of quantum theory. The Schrodinger equation and operator algebra. Bound state solutions and angular momentum. Prerequisite: PHYS 305 and 315.

PHYS 340 *Electronics*

Analog circuits, digital circuits, and semiconductor devices. Prerequisite: PHYS 305.

PHYS 350 *Advanced Experimental Laboratory* (W2)

Selected experimental work in nuclear and particle physics, condensed matter physics, electronics, optics, mechanics, and measurement techniques. Prerequisite: PHYS 305.

PHYS 370 *Thermodynamics*

The laws of thermodynamics, classical and quantum distribution functions, and an introduction to statistical mechanics. Prerequisite: PHYS 305.

PHYS 380 *Classical Mechanics*

Central force problem, Lagrangian and Hamiltonian formalisms, and special relativity. Prerequisite: PHYS 305.

PHYS 490 *Topics in Physics*

Topics will be determined by student and faculty interest. Possible topics may include: nuclear/particle physics, condensed matter, lasers and optics, statistical physics, mathematical methods. Prerequisite: PHYS 305 and consent.

POLITICS

Professors Cloyd and King
Associate Professors Barth and Maslin-Wicks (chair)

MAJOR

Eleven courses distributed as follows:

- POLI 100 Issues in Politics
- POLI 400 Research Methods
- POLI 497 Senior Research Seminar
- Political Theory: TWO from
 - POLI 240 History of Western Political Thought
 - POLI 245 American Political Thought
 - POLI 300 Feminist Political Thought
 - POLI 410 Topics in Political Theory
 - HIST 370 Communism, Fascism, and Democracy
- American Politics: TWO from
 - POLI 130 American State and Local Government
 - POLI 205 Southern Politics
 - POLI 220 American Political Parties and Elections
 - POLI 230 Public Administration
 - POLI 235 Public Policy
 - POLI 305 Arkansas Politics: Seminar
 - POLI 306 Arkansas Politics: Practicum
 - POLI 310 American Presidency
 - POLI 321 American Constitutional Law: The Federal System
 - POLI 322 American Constitutional Law: Individual Rights and Liberties
 - POLI 340 U.S. Congress
 - POLI 380 Gender, Sexuality, and American Politics
 - POLI 390 Race and American Politics
 - POLI 420 Topics in American Politics
- Comparative/Global Politics: TWO from
 - IRGS 400 Senior Seminar
 - POLI 250 Global Politics I
 - POLI 251 Global Politics II
 - POLI 260 Political Economy