

# Physics (PHYSICS)

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## Courses

### **PHYSICS 103. Fundamentals of Physics I. 4 Credits.**

A non-calculus physics sequence covering fundamentals of mechanics, energy, power, optics, and sound. Applications to the areas of biology, chemistry, earth science, and technology.

P: MATH 104 with at least a C grade or WPT-MFND score >465 and WPT-AALG score >525 and WPT-TAG score >525 or ACT Math score >26 or SAT Math score >630, PHYSICS 203 or concurrent enrollment.

Fall and Spring.

### **PHYSICS 104. Fundamentals of Physics II. 4 Credits.**

A non-calculus physics sequence covering fundamentals of electricity and magnetism, electronics, thermodynamics, and oscillations. Applications to the areas of biology, chemistry, earth science, and technology.

P: PHYSICS 103 with at least a C grade or PHYSICS 201 with at least a C grade, PHYSICS 203 with at least a C grade, PHYSICS 204 or concurrent enrollment.

Fall and Spring.

### **PHYSICS 141. Astronomy. 3 Credits.**

A study of the solar system, stars, galaxies and universe. High school algebra and geometry competency is highly recommended. Full credit will not be granted for both PHYSICS 141, PHYSICS 143, or both PHYSICS 141 and PHYSICS 144.

Fall and Spring.

### **PHYSICS 142. Observational Astronomy. 1 Credit.**

Observation of solar system, galactic and extra-galactic objects, and introduction to basic observational techniques in astronomy. Includes telescopic and unaided eye observation, positional astronomy, astro-photography, optic spectroscopy, interpretation of astronomical data, and astronomy laboratory exercises. High school algebra and geometry competency is highly recommended.

Fall and Spring.

### **PHYSICS 143. The Solar System. 3 Credits.**

Contemporary understanding of the Solar System; the sky and celestial motions; ancient astronomy; the Copernican revolution; light, gravity, orbits, and astronomical instruments; formation of the solar system; sun, planets and moons; asteroids, comets, meteors and meteorites; and the origin of life. High school algebra and geometry competency is highly recommended. Full credit will not be granted for both PHYSICS 141 and PHYSICS 143.

Fall Only.

### **PHYSICS 144. Stars, Galaxies and the Universe. 3 Credits.**

Contemporary understanding of stellar systems: historical development; light, gravity, atoms and nuclei; astronomical instruments; properties and life cycles of the Sun and stars; black holes; the Milky Way and other galaxies; cosmology. High school algebra and geometry competency is highly recommended. Full credit will not be granted for both PHYSICS 141 and PHYSICS 144.

Spring.

### **PHYSICS 180. Concepts of Physics. 3 Credits.**

Survey of physics, including motion, forces, momentum, energy, solids, liquids, gases, sound, heat, electricity, magnetism, light, atomic and nuclear physics. Designed for non science majors. Full credit will not be granted for both Physics 180 and 103, 104, 201 or 202.

Fall Only.

### **PHYSICS 181. Concepts of Physics Laboratory. 1 Credit.**

Laboratory course to accompany Physics 180. Full credit will not be granted for both Physics 181 and 103, 104, 201 or 202.

P: Physics 180 or conc enr.

Fall Only.

### **PHYSICS 198. First Year Seminar. 3 Credits.**

First Year Seminar, topics vary.

Reserved for New Incoming Freshman.

### **PHYSICS 201. Principles of Physics I. 4 Credits.**

A calculus physics sequence for students of science and engineering. Includes fundamentals of mechanics, Newton's laws, momentum, energy, fluid statics and dynamics; light and optics.

P: MATH 202 with at least a C grade, or concurrent enrollment in MATH 202 with instructor consent, PHYSICS 203 or concurrent enrollment.

Fall Only.

### **PHYSICS 202. Principles of Physics II. 4 Credits.**

A calculus physics sequence for students of science and engineering. Includes fundamentals of temperature, heat transfer, thermodynamics; vibrations, waves and sound; electric forces and fields, DC and AC circuits, magnetism; atomic structure, semiconductors; and electromagnetic waves.

P: Either PHYSICS 201 with at least a C grade or ENGR 214 with at least a C grade

Fall and Spring.

**PHYSICS 203. Introductory Physics Lab I. 1 Credit.**

Laboratory course to accompany PHYSICS 103 or PHYSICS 201.

Fall and Spring.

**PHYSICS 204. Introductory Physics Lab II. 1 Credit.**

Laboratory course to accompany PHYSICS 104 or PHYSICS 202.

Fall and Spring.

**PHYSICS 310. Modern Physics. 3 Credits.**

Modern physics has opened the door to exciting areas of exploration: very fast, very small, and very large. This course first examines the fast and small (relativity and quantum mechanics) then applies them to the large scale field of cosmology.

P: MATH 202

Spring Even.

**PHYSICS 404. Electricity and Magnetism. 3 Credits.**

An advanced approach to electrical and magnetic phenomena; waveguides, electrical energy generation and transmission, Maxwell's equations and electromagnetic waves, electric and magnetic properties of matter.

P: Physics 202 with at least a C grade and Math 209 with at least a C grade.

Fall Even.

**PHYSICS 417. Nuclear Physics and Radiochemistry. 3 Credits.**

Properties and reactions of atomic nuclei; application of the properties of radioactive nuclei to the solution of chemical, physical, biological and environmental problems.

P: Chem 212 and 214 with at least a C grade and Physics 202 with at least a C grade; REC: Chem 321.

Fall Odd.

**PHYSICS 420. Advanced Physics Laboratory. 1 Credit.**

Upper-level experiments in Nuclear Physics, Optics and the experimental determination of fundamental physical constants.

P: Math 203 with at least a C grade, Physics 310 with at least a C grade.

Fall Odd.

**PHYSICS 495. Teaching Assistantship. 1-6 Credits.**

The student and supervising teacher must prepare a statement that identifies the course with which the assistantship will happen, objectives for the assistantship, and expectations in order to fulfill the course objectives. Students are not eligible to receive credit in both the course they assist the instructor with and the teaching assistantship in the same semester. Typically student has previously taken the course prior to enrollment in the assistantship. Course is repeatable for credit.

Fall and Spring.

**PHYSICS 497. Internship. 1-12 Credits.**

Supervised practical experience in an organization or activity appropriate to a student's career and educational interests. Internships are supervised by faculty members and require periodic student/faculty meetings. Course is repeatable for credit.

P: jr st.

Fall and Spring.

**PHYSICS 498. Independent Study. 1-4 Credits.**

Independent study is offered on an individual basis at the student's request and consists of a program of learning activities planned in consultation with a faculty member. A student wishing to study or conduct research in an area not represented in available scheduled courses should develop a preliminary proposal and seek the sponsorship of a faculty member. The student's advisor can direct him or her to instructors with appropriate interests. A written report or equivalent is required for evaluation, and a short title describing the program must be sent early in the semester to the registrar for entry on the student's transcript.

P: fr or so st with cum gpa  $>$  or  $=$  2.50; or jr or sr st with cum gpa  $>$  or  $=$  2.00.

Fall and Spring.