PHYSICS (PHYS)

PHYS 100 Astronomy 4.00
Includes a brief history of astronomy, the study of the motions and structures of the Earth, the moon, the sun, planets, stars and galaxies and consideration of cosmological theories. (Lecture three hours, laboratory two hours.)
University Studies Requirements:
- Natural Sciences - Lab

Typically Offered:
- On-Campus: Fall
- Online: Spring

PHYS 107 Algebra-Based Physics I 4.00
Newtonian mechanics and waves. Designed for students majoring in the humanities, education, medical sciences, or biological sciences. (Lecture three hours, laboratory two hours.)
Prerequisites:
MATH 102, 113 or 115 with grade of C-or better or instructor consent

University Studies Requirements:
- Natural Sciences - Lab

Typically Offered:
- On-Campus: Fall;

PHYS 108 Algebra-Based Physics II 4.00
Continuation of PHYS 107 covering electricity, magnetism, and light. (Lecture three hours, laboratory two hours.)
Prerequisites:
PHYS 107 or 201 with a grade of C- or better.

Typically Offered:
- On-campus: Spring;

PHYS 160 Physical Science 4.00
Laboratory-oriented course covering the basic concepts of physics and chemistry. (Lecture three hours, laboratory two hours.)
University Studies Requirements:
- Natural Sciences - Lab

Typically Offered:
- On-campus: Spring
- Online: Fall & Summer

PHYS 189 Physics Elective 1.00-9.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

PHYS 201 Calculus-Based Physics I 5.00
Newtonian mechanics, waves and thermodynamics. (Lecture four hours, laboratory two hours.)
Prerequisites:
Prerequisite for this course is MATH 151 OR MATH 240

University Studies Requirements:
- Natural Sciences - Lab

Typically Offered:
- On-Campus: Fall;

PHYS 202 Calculus-Based Physics II 5.00
Electricity, magnetism, and light. (Lecture four hours, laboratory two hours.)
Prerequisites:
Prerequisite for this course is MATH 241, PHYS 201 or 205

Typically Offered:
- On-campus: Spring;

PHYS 205 Calculus Applications in Introductory Physics I 1.00
Supplemental to introductory non-calculus-based PHYS 107 course. Covers the calculus applications which are normally covered in the calculus-based course PHYS 201. Students who have taken PHYS 107 may decide to supplement their physics background with this course to gain access to higher level courses which have calculus-based physics as a pre-requisite.
Prerequisites:
Prerequisites: PHYS 107, Math 240 and instructor consent.

Typically Offered:
- On-campus: Select Semesters;

PHYS 206 Calculus Applications in Introductory Physics II 1.00
Supplemental to introductory non-calculus based PHYS 108. Covers the calculus applications which are normally covered in the calculus-based course PHYS 202. Students who have taken PHYS 108 may decide to supplement their physics background with this course to gain access to higher-level courses which have calculus-based physics as a pre-requisite.
Prerequisites:
Prerequisites: PHYS 108, MATH 241 and instructor consent.

Typically Offered:
- On-campus: Select Semesters;

PHYS 281 Selected Topics 1.00-6.00
May be offered for individualized or multiple-student instruction on a particular topic. May be independent study, lecture or laboratory. Topics(s) selected based on student interest with approval of instructor.
Typically Offered:
- Occasional by Demand

PHYS 289 Physics Elective 1.00-99.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

PHYS 289ES Physics Elective Environmental Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

PHYS 289LS Physics Elective Lab Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

PHYS 300 History and Philosophy of Science 3.00
Examines the nature of science, the history of science, and the nature and history of the impact of science on human life and thought. Provides some understanding of the methods of science, the difference between science and pseudo science, the political and ideological uses of science, and the moral responsibilities of scientists and science educators.
Typically Offered:
- Online: Spring, Even Years

PHYS 311 Mechanics 4.00
Classical mechanics, mathematical techniques using vector calculus, conservation laws and their relation to symmetry principles, rigid body dynamics, accelerated coordinate systems, and introduction to the generalized coordinate formalisms of LaGrange and Hamilton. (Lecture four hours.)
Prerequisites:
Prerequisite for this course is MATH 241, PHYS 201 or 205

Typically Offered:
- On-campus: Select Semesters;

PHYS 321 Electrical Circuits and Electronics 2.00-4.00
Laboratory based course in analog and digital circuits, AC and DC circuits, resonance, filters, transistors, operational amplifies, logic, memory, microprocessors and computer architecture.
Prerequisites:
Prerequisite: PHYS 202 or PHYS 206

Typically Offered:
- On-campus: Select Semesters;

PHYS 325 Wave Motion and Optics 3.00
Wave phenomena with specific applications to plane electromagnetic waves, reflection, refraction, guided waves and the process of radiation.
Prerequisites:
Prerequisite: PHYS 202 or PHYS 206

Typically Offered:
- On-campus: Select Semesters;

PHYS 375 Physics Laboratory 1.00-3.00
Extended laboratory experiments selected to give experiences in advanced physics concepts and techniques. Experiments are agreed upon between the instructor and student. (Laboratory two-six hours.) May be repeated when topics are different. Instructor consent required for taking this course.
Typically Offered:
- On-campus: Select Semesters;

PHYS 381 Intermediate Topics 1.00-6.00
May be offered for individualized or multiple-student instruction on a particular topic. May be independent study, lecture or laboratory. Topic(s) selected based on student interest with approval of instructor. May be repeated when topics are different.
Typically Offered:
- On-campus: Select Semesters;

PHYS 389 Physics Elective 1.00-9.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

PHYS 398 Physics Tutorial Project 1.00-4.00
Tutoring students in 100-level physics courses under supervision of a physics staff member. (Three hours per week per credit.)
Prerequisites:
Prerequisite: PHYS 108 or PHYS 202 and instructor consent

Typically Offered:
- On-campus: Select Semesters;

PHYS 401 Modern Physics 3.00
Non-classical phenomena and their explanation in relativity and quantum mechanics. Topics include Special Relativity, relativistic transformations, E=mc2 spacetime, wave-particle duality of matter and light, the Heisenberg uncertainty principle, Schrodinger's equation, atomic physics, quantum numbers, spin, nuclear physics, radioactivity, nuclear forces, and the Standard Model. (Lecture three hours.)
Prerequisites:
Prerequisite: PHYS 202 or PHYS 206.

Typically Offered:
- On-campus: Select Semesters;

PHYS 448 Atomic And Quantum Physics 4.00
Introduction to the philosophy and mathematics of quantum mechanics, including uncertainty, wave-particle duality, problem solving in tunneling and boundary conditions, time-dependent wave functions, the quantum mechanics of hydrogen, alkali metals, and chemical bonding. (Lecture four hours.)
Prerequisites:
Prerequisite: PHYS 202 or PHYS 206

Typically Offered:
- On-campus: Select Semesters;

PHYS 489 Physics Elective 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

PHYS 489ES Physics Elective Environmental Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

PHYS 489LS Physics Elective Lab Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

PHYS 491 Physics Research 1.00-4.00
Individual laboratory and/or theoretical investigation of a problem selected by the student and faculty or other skilled supervisor. The project will include study of related literature and formal reporting. Designed to give junior/senior level students practical experience in physics research. May be repeated for a total of four credits.
Typically Offered:
- On-campus: Fall & Spring;