

Physics

The following matrix indicates those courses deemed transferable among institutions listed across the top of the matrix. The numbers on the matrix represent the number of semester hours associated with the course at each institution and which institutions have agreed to transfer the commonly numbered course in each row.

A list of the academic discipline liaisons contacts for each institution are listed at the bottom of this document.

| Prefix | Number | GERTA | Course Title | BSC | DCB | DSU | LRSC | MASU | MISU | NDSCS | NDSU | UND | VCSU | WSC | SBC | TMCC | UTTC |
|----------|----------|----------|-----------------------------------|-----|-----|-----|------|------|------|-------|------|-----|------|-----|-----|------|------|
| PHYS | 100/100L | ND:LABSC | Concepts of Physics | 3/1 | | | | | | | | | 4 | | | | |
| PHYS | 110 | ND:SCI | Introductory Astronomy | | | 3/1 | 3 | | | 3 | | | | 3 | | | |
| PHYS | 110/110L | ND:LABSC | Introductory Astronomy | 3/1 | | | | 4 | 4 | | 3/1 | 3/1 | 4 | 3/1 | | | |
| PHYS | 120/120L | ND:LABSC | Fundamentals of Physics | | | | | | | | 3/1 | | | | 4 | | |
| PHYS | 130/130L | ND:LABSC | Natural Science-Physics | | | | | | | | | 4 | | | | | |
| PHYS | 140 | | Physics for Poets | | | | | | | | | 3 | | | | | |
| PHYS | 161/161L | ND:LABSC | Intro College Level Physics I/Lab | | | | | | | | | 4 | 4 | | | | |
| PHYS | 162/162L | ND:LABSC | Introductory College Physics II | | | | | | | | | 4 | 4 | | | | |
| PHYS/PHY | 211/211L | ND:LABSC | College Physics I | 3/1 | 4 | 3/1 | 4 | 3/1 | 4 | 3/1 | 3/1 | 4 | 4 | 4 | 4 | 4 | 4 |
| PHYS | 212/212L | ND:LABSC | College Physics II | 3/1 | 4 | 3/1 | 4 | 3/1 | 4 | 3/1 | 3/1 | 4 | 4 | 4 | 4 | 4 | |
| PHYS | 221 | ND:LABSC | General Physics I | | 4 | | | | | | | | | | | | |
| PHYS | 222 | ND:LABSC | General Physics II | | 4 | | | | | | | | | | | | |
| PHYS/PHY | 251/251L | ND:LABSC | University Physics I | 4/1 | 5 | 4/1 | 4 | 4/1 | 5 | 4/1 | 4/1 | 4 | 5 | 5 | 4 | | 4 |
| PHYS | 252/252L | ND:LABSC | University Physics II | 4/1 | 5 | 4/1 | 4 | 4/1 | 5 | 4/1 | 4/1 | 4 | 5 | 5 | 4 | | 4 |

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|--------|----------|-------|------------------------|-----|-----|-----|------|------|------|-------|------|-----|------|-----|-----|------|------|
| PHYS | 253/253L | | University Physics III | | | | | | | | | 4 | | | | | |

PHYS 100/100L Concepts of Physics

An introduction to the concepts of physics as they apply to everyday life. Ideas are presented with a conceptual rather than mathematical approach. The laboratory is a corequisite of this course.

PHYS 105 Physical Science by Inquiry

In this course students will be involved in an in-dept inquiry-based exploration of basic principles of physical science which are often taught in elementary school. It covers topic of properties of matter, light and color, electric circuits, and kinematics. Inquiry based units are supplemental with material on the history of scientific development.

PHYS 110 Introductory Astronomy

This is an introductory astronomy class intended to give the student an appreciation of the universe in which we live. Topics covered will include ancient astronomy and the Copernican Revolution, astronomical measurements and instruments, the solar system, stars and stellar evolution, galaxies, black holes, and cosmology.

PHYS 110/110L Introductory Astronomy

An introductory study of the universe: The solar system, stars, stellar evolution, galaxies, black holes, big bang cosmology, and the expanding universe. The astronomy laboratory is optional.

PHYS 120/120L Fundamentals of Physics

An application of the concepts and principles of physics to the real world. Topics selected form mechanics, heat, electricity, magnetism, optics, and atomic and nuclear physics.

PHYS 130/130L Natural Science-Physics

Topics selected to illustrate the nature and development of scientific thought, and may include waves, light, optics, the solar system, stars, and galaxies. The laboratory is a corequisite of this course.

PHYS 140 Physics for Poets

An introduction to the fundamental concepts of physics, especially those developed in the twentieth century. A knowledge of elementary algebra is recommended, but the course is designed for students with a limited mathematical background. No laboratory.

PHYS 161/161L Intro College Level Physics I/Lab

An introduction to the principles and concepts of physics with the application of minimal mathematics, sufficient to show the logical progression from one topic to the next. General physics for those who do not plan to take advanced courses in science. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, vibrations and waves, electricity and magnetism, light, and optics. The laboratory is a corequisite of this course. Physics 161 has no

mathematical prerequisite, but knowledge of elementary algebra is recommended.

PHYS 162/162L Introductory College Physics II

An introduction to the principles and concepts of physics with the application of minimal mathematics, sufficient to show the logical progression from one topic to the next. General physics for those who do not plan to take advanced courses in science. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, vibrations and waves, electricity and magnetism, light, and optics. The laboratory is a corequisite of this course. Prerequisites: PHYS 161.

PHYS 203 Introduction to Physics I

Elementary laws and principles of mechanics and fluids. Prerequisite: MATH 103.

PHYS 204 Introduction to Physics II

Elementary laws of electricity and magnetism, optics, and modern physics. Prerequisite: PHYS 203.

PHYS 211/211L College Physics I

This non-calculus general physics course is recommended for pre-medical or pre-professional students. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, heat, and thermodynamics. The laboratory is a corequisite of this course. A student may not receive credit for Physics 211, 211L, Physics 212, 212L and also Physics 161, 161L, and Physics 162, 162L. Prerequisites: College Algebra.

PHYS 212/212L College Physics II

This non-calculus general physics course is recommended for pre-medical or pre-professional students. Topics: vibrations and waves, electricity and magnetism, light and optics, and an introduction to modern physics. The laboratory is a corequisite of this course. A student may not receive credit for Physics 211, 211L, Physics 212, 212L and also Physics 161, 161L, and Physics 162, 162L. Prerequisites: Physics 211.

PHYS 221 General Physics I

Newton's laws; work and energy; impulse and momentum; angular momentum; oscillations; gravity; wave motion; thermodynamics. Corequisite: MATH 166.

PHYS 222 General Physics II

Electricity; Gauss' laws and potential difference; magnetism; Maxwell's equations; optics; introduction to Modern Physics. Prerequisite: PHYS 221. Corequisite: MATH 265.

PHYS 251/251L University Physics I

The calculus-based general physics course sequence for students majoring in chemistry, physics, or engineering. Topics: Newtonian mechanics and gravitation, work and energy, solids and fluids, heat and thermodynamics. The laboratory is a corequisite of this course. A student may not receive credit for Physics 251, 251L, Physics 252, 252L and also Physics 211, 211L, Physics 212, 212L or Physics 161, 161L, Physics 162, 162L. Prerequisites: Calculus I.

PHYS 252/252L University Physics II

The calculus-based general physics course sequence for students majoring in chemistry, physics, or engineering. Topics: vibrations and waves, electricity and magnetism, light and optics, and an introduction to modern physics. The laboratory is a corequisite of this course. A student may not receive credit for Physics 251, 251L, Physics 252, 252L and also Physics 211, 211L, Physics 212, 212L or Physics 161, 161L, Physics 162, 162L. Prerequisites: Calculus II.

PHYS 253/253L University Physics III

Prerequisites: Math 265, Phys 252 and 252L. Corequisite: Phys 253L. Modern physics, a survey covering physics of the 20th and 21st centuries. Topics normally covered include theory of relativity, discovery of quantum phenomena, basic quantum mechanics, overview of atomic, nuclear, and solid-state physics, statistical physics, quantum fluids and superconductivity, fundamental forces and the physics of elementary particles. This course is a prerequisite for most courses in advanced physics. The lab is a corequisite for Phys 253.

The following individuals are liaisons for this discipline. Those marked with an asterisk (*) are chairs.