

HIGH SCHOOL SCIENCE COURSE CODES GRADES 9-12

High school (grades 9-12) courses in Science require 150 contact hours per credit.

Course Code	Course Name	Recommended Grade Levels	Description	High School Credit Options*	License/credential Required**
13020	Biology	9-12	Biology is designed to provide information regarding the fundamental concepts of life and life processes. This course includes (but are not restricted to) such topics as cell structure and function, general plant and animal physiology, genetics, and taxonomy.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	License Code: 13010-Biology ♦ 5-12 or 9-12
13021	Human Anatomy (Science) ♦ Recommended Prerequisite: Biology	10-12	Human Anatomy (Science) presents an in-depth study of the human body and biological system. Students study such topics as anatomical terminology, cells, and tissues and typically explore functional systems, such as skeletal, muscular, circulatory, respiratory, digestive, reproductive, and nervous systems. Note: This course can be taught for Science credit only. For Physical Education credit, the Human Anatomy (Phy. Ed.) can be found under Physical Education.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	
13022	Physiology ♦ Recommended Prerequisite: Biology	10-12	Physiology examines all major systems, tissues, and muscle groups in the human body to help students understand how these systems interact and their role in maintaining homeostasis. This course may also cover such topics as cell structure and function, metabolism, and the human life cycle. Note: This course can be taught for Science credit only. For Physical Education credit, Sports Physiology can be found under Physical Education and Health.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	
13023	Health	9-12	Topics covered within Health Education courses may vary widely, but typically include personal health (nutrition, mental health and stress management, drug/alcohol abuse prevention, disease prevention, and first aid) and consumer health issues. The course may also include brief studies of environmental health, personal development, and/or community resources. Note: This course can be taught for Science credit only. For CTE credit, Health (Individual and Family Health) can be found under Family and Consumer Science. For Physical Education credit, Health can be found under Physical Education and Health. This course may also satisfy the health requirement for graduation.	$\frac{1}{4}$, $\frac{1}{2}$, or 1 <i>Max credit = 1</i>	

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13024	Botany/Horticultural Science I	9-12	<p>This course prepares students to produce greenhouse/ nursery plants and to maintain plant growth and propagation structures. Topics to be covered include: soils, plants, plant identification, and plant entomology. Courses examine the importance of plant cell structures, functions of cells, plant processes, nonvascular plants, vascular plants, roots, stems, leaves, flowers, and reproduction of plants. Students may be introduced to the biological, environmental, conservation, and ecological concepts encountered in our environment. Landscape design units will prepare students to design, construct, and maintain planted areas and devices for the beautification of home grounds and other areas of human habitation and recreation. This course will reinforce and extend students' understanding of science by associating basic scientific principles and concepts with relevant applications in agriculture. Leadership development and supervised agricultural experience programs are also an integral part of this course.</p> <p>Note: This course can be taught for Science credit only. For CTE credit, Botany/Horticultural Science I can be found under Agricultural Education.</p>	<p>½ or 1</p> <p><i>Max credit = 1</i></p>	<p>License Code: 13010-Biology ◆ 5-12 or 9-12</p>
13025	Botany/Horticultural Science II	9-12	<p>This course prepares students to produce greenhouse/nursery plants and to maintain plant growth and propagation structures. Topics to be covered include: soils, plants, plant identification, and plant entomology. Courses examine the importance of plant cell structures, functions of cells, plant processes, nonvascular plants, vascular plants, roots, stems, leaves, flowers, and reproduction of plants. Students may be introduced to the biological, environmental, conservation, and ecological concepts encountered in our environment. Landscape design units will prepare students to design, construct, and maintain planted areas and devices for the beautification of home grounds and other areas of human habitation and recreation. This course will reinforce and extend students' understanding of science by associating basic scientific principles and concepts with relevant applications in agriculture. Leadership development and supervised agricultural experience programs are also an integral part of this course.</p> <p>Note: This course can be taught for Science credit only. For CTE credit, Botany/Horticultural Science II can be found under Agricultural Education.</p>	<p>½ or 1</p> <p><i>Max credit = 1</i></p>	

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13026	Ornithology	9-12	In Ornithology, students will discover the world of birds. Topics include flight, structure, evolution, classification, behavior, habitat, and conservation. Note: This course may not be substituted for the biology course required for graduation.	$\frac{1}{2}$ <i>Max credit = $\frac{1}{2}$</i>	License Code: 13010-Biology ◆ 5-12 or 9-12
13027	Entomology	9-12	Entomology is a basic, non-technical introduction to the study of insects and the ways they live. Course topics include insect importance, life cycles, classification, anatomy and physiology, behavior, and medical entomology. Note: This course may not be substituted for the biology course required for graduation.	$\frac{1}{2}$ <i>Max credit = $\frac{1}{2}$</i>	
13028	Real World Biology	9-12	Real World Biology is a lab course designed around real world issues that can be explored through the integration of biology and mathematics. Students will apply tools acquired in previous math and biology classes to relevant and engaging problems. Through the use of mathematical models and sound reasoning, students will derive solutions in the areas of population growth, ecology, genetics, epidemiology, and forensics. This course will adhere to state biology standards. Note: This course may not be substituted for the biology course required for graduation.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	
13029	Advanced Biology ◆ Recommended Prerequisite: Biology, Chemistry, and appropriate mathematics	10-12	Usually taken after a comprehensive initial study of biology, Advanced Biology covers biological systems in more detail. Topics that may be explored include cell organization, function, and reproduction; energy transformation; human anatomy and physiology; and the evolution and adaptation of organisms.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	
13030	Physical Science	8 (see note) 9-12	Physical Science involves the study of the structures and states of matter. Typically (but not always) offered as introductory survey courses, they may include such topics as forms of energy, wave phenomenon, electromagnetism, and physical and chemical interactions. NOTE: This course code should only be used for MIS03 reporting purposes when a grade 8 student is receiving high school credit.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	License Code: 13045-Physical Science ◆ 5-12 or 9-12

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13031	Chemistry	9-12	Chemistry involves studying the composition, properties, and reactions of substances. This course typically explores such concepts as the behaviors of solids, liquids, and gases; acid/base and oxidation/reduction reactions; and atomic structure. Chemical formulas and equations and nuclear reactions are also studied.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	License Code: 13020-Chemistry ◆ 5-12 or 9-12
13032	Advanced Chemistry ◆ Recommended Prerequisite: Chemistry	10-12	Usually taken after a comprehensive initial study of chemistry, Advanced Chemistry covers chemical properties and interactions in more detail. Advanced Chemistry topics include organic chemistry, thermodynamics, electrochemistry, macromolecules, kinetic theory, and nuclear chemistry.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	
13034	Applied Biology/Chemistry	9-12	Applied Biology/Chemistry integrates biology and chemistry into a unified domain of study and presents the resulting body of knowledge in the context of work, home, society, and the environment, emphasizing field and laboratory activities. Topics include natural resources, water, air and other gases, nutrition, disease and wellness, plant growth and reproduction, life processes, microorganisms, synthetic materials, waste and waste management, and the community of life.	1 or 2 <i>Max credit = 2</i>	License Code: 13010-Biology ◆ 5-12 or 9-12 OR 13020-Chemistry ◆ 5-12 or 9-12
13036	Forensic Science ◆ Recommended Prerequisite: Biology, Physical Science, or Departmental Approval	11-12	Students will learn the methodology needed to evaluate a crime scene, the proper lab mechanics needed to evaluate evidence, and how to compare between a known and unknown. Topics may include the history of forensic science, collecting of evidence, analyzing results and hands-on application of many laboratory techniques used in solving crimes. Emphasis would be placed on the application of the scientific method to life-long skills and problem solving.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	License Code: 13036-Forensic Science ◆ 10-12
13042	Physics	9-12	Physics involves the study of the forces and laws of nature affecting matter, such as equilibrium, motion, momentum, and the relationships between matter and energy. The study of physics includes examination of sound, light, and magnetic and electric phenomena.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	License Code: 13050-Physics ◆ 5-12 or 9-12
13044	Applied Physics	9-12	Applied Physics introduces students to mechanical, fluid, electrical, and thermal principles and systems on which modern equipment operates. Student activities examine the similarities of force, work, rate, resistance, energy, power, and force transformers in the mechanical, fluid, electrical, and thermal systems.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	

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13045	Principles of Technology	10-12	Principles of Technology focus on the study of the forces and laws of nature and their application to modern technology. Equilibrium, motion, momentum, energy conversion, electromagnetism, and optical phenomena are presented in the context of current, real-world applications. Demonstrations, math labs, and applied laboratory experiments are an integral part of the Principles of Technology curriculum. This course enables students to gain a solid foundation for careers in electronics, robotics, telecommunications, and other technological fields.	1 <i>Max credit = 1</i>	License Code: 13050-Physics ◆ 5-12 or 9-12
13052	Biotechnology	9-12	Students will explore the history of biotechnology, including early attempts at food preservation, the development of antibiotics, and changes to food crops around the world. They will learn about some of the challenges of biotechnology, such as the growth of antibiotic resistant bacteria and questions about the safety of commercially produced genetically modified organisms (GMOs). They will also research new biotechnologies and how they are changing the world we live in.	$\frac{1}{2}$, or 1 <i>Max credit = 1</i>	License Code: 13010-Biology ◆ 5-12 or 9-12
13061	Astronomy	9-12	Astronomy offers students the opportunity to study the solar system, stars, galaxies, and interstellar bodies. This course usually introduces and uses astronomic instruments and typically explores theories regarding the origin and evolution of the universe, space, and time.	$\frac{1}{4}$ or $\frac{1}{2}$ <i>Max credit = $\frac{1}{2}$</i>	License Code: 13035-Earth Science ◆ 5-12 or 9-12
13062	Geology	9-12	Geology provides an in-depth study of the forces that formed and continue to affect the earth's surface. Earthquakes, volcanoes, and erosion are examples of topics that are presented.	$\frac{1}{4}$, $\frac{1}{2}$, or 1 <i>Max credit = 1</i>	
13063	Earth Science (Secondary)	9-12	Earth Science offers insight into the environment on earth and the earth's environment in space. While presenting the concepts and principles essential to students' understanding of the dynamics and history of the earth, this course usually explores oceanography, geology, astronomy, meteorology, and geography.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	
13064	Meteorology	9-12	Meteorology examines the properties of the earth's atmosphere. Topics usually include atmospheric layering, changing pressures, winds, water vapor, air masses, fronts, temperature changes and weather forecasting.	$\frac{1}{4}$ or $\frac{1}{2}$ <i>Max credit = $\frac{1}{2}$</i>	
13065	Environmental Science ◆ Recommended Prerequisite: Biology, Physical Science, or Departmental Approval	11-12	Environmental Science examines the mutual relationships between organisms and their environment. In studying the interrelationships among plants, animals, and humans, this course usually covers the following subjects: photosynthesis, recycling and regeneration, ecosystems, population and growth studies, pollution, and conservation of natural resources.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	License Code: 13025-Environmental Science ◆ 10-12

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13074	Oceanography	9-12	Oceanography focuses on the content, features, and possibilities of the earth's oceans. It explores marine organisms, conditions, and ecology and sometimes covers marine mining, farming, and exploration.	$\frac{1}{4}$ or $\frac{1}{2}$ <i>Max credit = $\frac{1}{2}$</i>	License Code: 13035-Earth Science ◆ 5-12 or 9-12
13110	Ecology	9-12	Ecology provides students with a basic understanding of living things. Topics covered may include ecology and environmental problems such as overpopulation and pollution as well as cells, types of organisms, evolutionary behavior, and inheritance.	$\frac{1}{4}$, $\frac{1}{2}$, or 1 <i>Max credit = 1</i>	License Code: 13010-Biology ◆ 5-12 or 9-12
13150	STEM Seminar (Science)	9-12	STEM Seminar provides students with a project based and integrated and holistic experience with Science Technology Engineering and Math. Taught by an interdisciplinary team of teachers, the course demonstrates the blurring of content areas when solving an authentic problem. It focuses on engaging students in hands on interdisciplinary application of the Engineering Design Process. Students engage in authentic projects and create products, presentations, and network with local STEM industry experts. In this course students uncover and acquire a cohesive set of concepts, competencies, and dispositions of science, technology, engineering, and mathematics that they transfer and apply in both academic and real-world contexts in order to be globally competitive in the 21 st Century. This course curriculum infuses academic content from Math, Science, Language Arts, and Social Studies. It utilizes state standards, technical skills and develops 21 st Century Skills such as communication, networking, collaboration, decision making, creativity and critical thinking. Note: This course can be taught for Science credit only. For Mathematics credit, use STEM Seminar (Math) under Mathematics. For Technology and Engineering credit, use STEM Seminar (Tech Ed) under Technology and Engineering. Note: Only one (1) credit of this course can be used towards the coordinated plan of study for the Academic and Career and Technical Education Scholarship.	$\frac{1}{2}$ or 1 <i>Max credit = 2</i>	License Code: Any Science degree ◆ 5-12 or 9-12

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13580	Advanced Placement Biology©	10-12	The course is based on four Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about living organisms and biological systems. Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices enables teachers to use the principles of scientific inquiry to promote a more engaging and rigorous experience for AP Biology students. Twenty-five percent of instructional time is devoted to hands-on laboratory work with an emphasis on inquiry-based investigations. Investigations require students to ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their process.	½ or 1 <i>Max credit = 1</i>	License Code: 13010-Biology ◆ 5-12 or 9-12
13581	Advanced Placement Chemistry©	10-12	The AP Chemistry course provides students with a college-level foundation to support future advanced course work in chemistry. Students cultivate their understanding of chemistry through inquiry-based investigations, as they explore topics such as: atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium. This course requires that 25 percent of the instructional time provides students with opportunities to engage in laboratory investigations. This includes a minimum of 16 hands-on labs, at least six of which are inquiry based.	½ or 1 <i>Max credit = 1</i>	License Code: 13020-Chemistry ◆ 5-12 or 9-12
13582	Advanced Placement Environmental Science©	10-12	The AP Environmental Science course is designed to be the equivalent of a one-semester, introductory college course in environmental science, through which students engage with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world. The course requires that students identify and analyze natural and human-made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them. This course is interdisciplinary, embracing topics from geology, biology, environmental studies, environmental science, chemistry, and geography. Although there are no specific AP Environmental Science labs or field investigations required for the course, it is expected that students perform as many labs/field investigations as possible.	½ or 1 <i>Max credit = 1</i>	License Code: 13025-Environmental Science ◆ 10-12

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13584	Advanced Placement Physics C: Electricity and Magnetism©	10-12	AP Physics C: Electricity and Magnetism is a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. Introductory differential and integral calculus is used throughout the course. AP Physics C: Electricity and Magnetism should include a hands-on laboratory component comparable to a semester-long introductory college-level physics laboratory. Students should spend a minimum of 20 percent of instructional time engaged in hands-on laboratory work. Students ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress. Each student should complete a lab notebook or portfolio of lab reports.	½ or 1 <i>Max credit = 1</i>	License Code: 13050-Physics ◆ 5-12 or 9-12
13585	Advanced Placement Physics C: Mechanics©	10-12	AP Physics C: Mechanics is equivalent to a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as kinematics; Newton's laws of motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. Introductory differential and integral calculus is used throughout the course. AP Physics C: Mechanics should include a hands-on laboratory component comparable to a semester-long introductory college-level physics laboratory. Students should spend a minimum of 20 percent of instructional time engaged in hands-on laboratory work. Students ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress. Each student should complete a lab notebook or portfolio of lab reports.	½ or 1 <i>Max credit = 1</i>	

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13586	Advanced Placement Physics 1: Algebra-Based	10-12	AP Physics 1 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of Physics through inquiry-based investigations as they explore topics such as Newtonian mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits. This course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to apply the science practices.	½ or 1 <i>Max credit = 1</i>	License Code: 13050-Physics ◆ 5-12 or 9-12
13587	Advanced Placement Physics 2: Algebra-Based	10-12	AP Physics 2 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of Physics through inquiry-based investigations as they explore topics such as fluid statics and dynamics; thermodynamics with kinetic theory; PV diagrams and probability; electrostatics; electrical circuits and capacitors; magnetic fields; electromagnetism; physical and geometric optics; and quantum, atomic, and nuclear physics. This course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to apply the science practices.	½ or 1 <i>Max credit = 1</i>	

* *High school curricular requirements are spelled out in NDCC 15.1-21-02. Maximum credit refers to the maximum units of credit a student may earn for a course over four years of high school. (Example: Band - a student may be enrolled in band all four years of high school -- earning a possible total of four units of credit.)*

** *Please refer to the second page of the teacher's North Dakota Educator's Professional license to verify which subject areas a teacher is qualified to teach. Licenses and endorsements are obtained on a teaching license from the Education Standards and Practices Board (ESPB). Credentials are obtained from the Department of Public Instruction (DPI) and are issued to individuals holding a current teaching license.*