

Science Course Descriptions

Elementary Science

- In **Kindergarten**, science introduces the use of simple classroom and field investigations to help students develop the skills of asking questions, gathering information, communicating findings, and making informed decisions. Using their own senses and common tools such as a hand lens, students make observations and collect information. Students also use computers and information technology tools to support their investigations.
- In **Grade 1**, the study of science includes simple classroom and field investigations to help students develop the skills of asking questions, gathering information, making measurements using non-standard units, with tools such as a thermometer to extend their senses, constructing explanations, and drawing conclusions. Students also use computers and information technology tools to support their investigations.
- In **Grade 2**, the study of science includes planning and conducting simple classroom and field investigations to help students develop the skills of making measurements using standard and non-standard units, using common tools such as rulers and clocks to collect information, classifying and sequencing objects and events, and identifying patterns. Students also use computers and information technology tools to support their investigations.
- In **Grade 3**, the study of science includes planning and implementing simple classroom and field investigations to develop the skills of collecting information using tools such as a microscope, making inferences, communicating conclusions, and making informed decisions. Students also use computers and information technology tools to support scientific investigations.
- In **Grade 4**, the study of science includes planning and implementing field and laboratory investigations using scientific methods, analyzing information, making informed decisions, and using tools such as compasses to collect information. Students also use computers and information technology tools to support scientific investigations.
- In **Grade 5**, the study of science includes planning and implementing field and laboratory investigations using scientific methods, analyzing information, making informed decisions, and using tools such as nets and cameras to collect and record information. Students also use computers and information technology tools to support scientific investigations.

Middle School Science

Students learn concepts in an integrated approach of life, earth, and physical sciences with an emphasis on inquiry-based field and laboratory investigations. A unit in personal health and sexuality is included at each grade level.

- In **Grade 6**, the study of science includes conducting field and laboratory investigations using scientific methods, analyzing data, making informed decisions, and using tools such as beakers, test tubes, and spring scales to collect, analyze, and record information. Students also use computers and information technology tools to support scientific investigations.
- In **Grade 7**, the study of science includes conducting field and laboratory investigations using scientific methods, critical-thinking, problem-solving, and using tools such as weather instruments and calculators to collect and analyze information to explain a phenomenon. Students also use computers and information technology tools to support scientific investigations.

- In **Grade 8**, the study of science includes planning and conducting field and laboratory investigations using scientific methods, analyzing data, critical-thinking, scientific problem-solving, and using tools such as telescopes to collect and analyze information. Students also use computers and information technology tools to support scientific investigations.

High School Science

All students will conduct field and laboratory investigations, use scientific methods and equipment during investigations and make informed decisions using critical thinking and scientific problem-solving. A minimum of forty percent of the time is committed to laboratory and field experiences in all 9-12th grade science courses.

- **Integrated Physics and Chemistry (IPC)**
Prerequisites – none
1 credit; one year course
Students conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical-thinking and scientific problem-solving. This course integrates the disciplines of physics and chemistry in the following topics: motion, waves, energy, transformations, properties of matter, changes in matter, and solution chemistry.
- **Biology**
Prerequisites – Algebra I (co-enrollment)
1 credit; one year course
Students in Biology study a variety of topics that include: structures and functions of cells, tissues and organs; nucleic acids and genetics; biological evolution; taxonomy; metabolism and energy; transfers in living organisms; living systems; homeostasis; ecosystems, plants and the environment.
- **Biology AP**
Prerequisite – Teacher Approval
1 credit; one year course
Biology AP is a laboratory-oriented course which includes the study of basic concepts and principles of specific life processes. This course will include topics regularly covered in a college biology course. Biology AP differs from the usual high school course in biology in respect to the range and depth of topics covered, the kind of laboratory work done by the students and the time and effort required of the students.
- **Chemistry**
Prerequisites – Geometry, Algebra II (co-enrollment)
1 credit; one year course
Students study a variety of topics that include: characteristics of matter; energy transformations during physical and chemical changes; atomic structure; periodic table of elements; behavior of gases; bonding; nuclear fusion; oxidation-reduction reactions; chemical equations; solutes; properties of solutions; acid and base reactions; and chemical reactions. Students will study how chemistry is an integral part of our daily lives.
- **Chemistry AP**
Grades 11th – 12th
Prerequisites: Chemistry, Algebra I, and Algebra II
1 – 1 ½ Credits
AP Chemistry should meet the objectives of a good general chemistry course. Students should attain a depth of understanding of fundamentals and a reasonable competence in dealing with chemical problems. The course should contribute to the development of the

students' abilities to think clearly and to express their ideas, orally and in writing, with clarity and logic.

- **Physics**

Prerequisites – Algebra II (co-enrollment)

1 credit; one year course

In Physics, students conduct field and laboratory investigations. They study a variety of topics that include: laws of motion; changes within physical systems and conservation of energy and momentum; force; thermodynamics; characteristics and behavior of waves; and quantum physics. It provides students with a conceptual framework, factual knowledge, and analytical and scientific skills.

- **Physics AP**

Grades 11th – 12th

Prerequisites: Physics, Algebra I, Algebra II, and Geometry

1 – 1 ½ credits

The course is to develop the students' abilities to do the following: read, understand and interpret physical information – verbal, mathematical and graphical; describe and explain the sequence of steps in the analysis of a particular physical phenomenon or problem; use basic mathematical reasoning – arithmetic, algebraic, geometric, trigonometric or calculus where appropriate – in a physical situation or problem; and perform experiments and interpret the results of observations, including making an assessment of experimental uncertainties.

- **Anatomy & Physiology**

Grades 11th & 12th only

Prerequisites: IPC, Biology and Chemistry and/or teacher approval

1 credit; one year course

This course will help the recognition of the importance of physiology at the cellular level. It will include basic anatomical and physiological principles of the integumentary, muscular, skeletal, nervous, endocrine, digestive, respiratory, cardiovascular, urinary, and reproductive systems.

- **Principles of Technology I**

Grades 10th – 12th

Prerequisites: One in Science and Algebra I

1 science credit

An applied physics course designed to provide a study in force, work, rate, resistance, energy, power, and force transformers as applied to mechanical, fluid, thermal, and electrical energy that comprise simple and technological devices and equipment. The course reinforces the mathematics applications a student needs to understand to apply the principles being studied.

- **Principles of Technology II**

Grades 11th – 12th

Prerequisite: Principles of Technology I

1 science credit

A second year applied physics course designed to study momentum, waves, vibrations, energy converters, transducers, radiation, optical systems, and time constraints as applied to mechanical, fluid, thermal, and electrical energy systems. The course reinforces the mathematics applications a student needs to apply the principles being studied.