

SCIENCE DEPARTMENT
Graduating classes of 2018 & 2019

Suggested sequence

Year 1	Biology 1 (or Honors)
Year 2	Chemistry (or Honors) or Physical Science
Year 3	1 year of elective

COURSE TITLES	CREDIT	GRADE LEVEL				PREREQUISITE
		9	10	11	12	
<u>Required Courses</u>						
Biology N	1	x				None
<i>Choose 1 Chemistry</i>						
Chemistry I N	.5		x	x	x	Algebra I
Honors Chemistry I N	.5		x	x	x	Algebra I
<u>Elective Courses</u>						
<i>Choose 1 Earth & Space Science</i>						
Earth & Space Science N	.5		x	x	x	None
Honors Earth & Space Science N	.5		x	x	x	None
Environmental Science N	.5		x	x	x	Biology and either Chemistry or Physical Science
Honors Environmental Science N	.5		x	x	x	Biology and either Chemistry or Physical Science
Chemistry II N	.5		x	x	x	Algebra I
Honors Chemistry II N	.5		x	x	x	Algebra I
Astronomy II N	.5		x	x	x	Earth and Space Science (or Honors) or Astronomy I
Forensics N	.5		x	x	x	Biology and either Chemistry or Physical Science
Honors Anatomy & Physiology N	1		x	x	x	Biology and Chemistry
Physics N	1		x	x	x	Algebra I and Geometry
AP Physics I N	1		x	x	x	Algebra II and Geometry
AP Physics II N	1		x	x	x	AP Physics I
AP Chemistry N	1		x	x	x	Honors Chemistry II
AP Biology N	1		x	x	x	Biology and Chemistry

N - NCAA approved courses

SCIENCE DEPARTMENT SEQUENCE (graduating classes of 2018 & 2019)

CAREER READINESS	COLLEGE READINESS	AP/HONORS
Intro to Biology	General Biology	Honors Biology
Physical Science	General Chemistry*	Honors Chemistry
<u>ELECTIVES</u> Astronomy II** Earth & Space Science** General Chemistry Physics	<u>ELECTIVES</u> AP Biology AP Physics 1 AP Physics 2 Astronomy II** Earth & Space Science** Environmental Biology Forensics** Honors Anatomy & Physiology Physics	<u>ELECTIVES</u> AP Biology AP Physics 1 AP Physics 2 Astronomy II** Earth & Space Science** Environmental Biology Forensics** Honors Anatomy & Physiology Physics

*indicates honors course is optional

**indicates 0.5 credit course

Graduating classes of 2018 & 2019 COURSE DESCRIPTIONS

AP BIOLOGY N

171511

GRADES: 10-12

***PREREQUISITE: A grade of B or better in Biology II and Chemistry I**

1 CREDIT/2 TERMS

This course will prepare students to successfully pass the Advanced Placement Biology exam written by the College Board in May. It is designed to be the equivalent of a college introductory biology course usually taken by biology majors. AP Biology students are expected to read nightly, write weekly essays, complete study guides, take exams and perform several labs throughout the semester. AP Biology is taught as a college level class in the high school setting, so the grading scale is adjusted to accommodate the rigorous material.

STANDARDS:

The students will utilize the 4 “Big Ideas” in biology to explain and apply the “Enduring Understandings” as directed by the College Board. These Ideas along with their Enduring Understandings are listed in detail on page 8 of the College Board Document

Big Ideas:

1. The process of evolution drives the diversity and unity of life.
2. Biological systems utilize energy and molecular building blocks to grow, to reproduce and to maintain homeostasis.
3. Living systems store, retrieve, transmit and respond to information essential to life processes.
4. Biological systems interact, and these interactions possess complex properties

AP CHEMISTRY N

172511

GRADES: 10-12

***PREREQUISITE: Honors Chemistry II**

1 CREDIT/2 TERMS

This is a college level course that expands topics covered in honors chemistry as well as introduce new areas of study such as electrochemistry and organic chemistry. It provides students a wide opportunity to develop and improve their investigative skills. Basic concepts of chemistry are reviewed, then developed into increasingly sophisticated ideas that are useful in other physical, biological, and applied sciences such as medicine, engineering, agriculture, and consumer sciences. Students completing AP Chemistry may elect to take the National CEEB Advanced Placement Exam to earn college credit.

The students will:

- understand and apply knowledge of the structure of atoms
- understand and apply knowledge of the structure and properties of matter.
- understand and apply knowledge of chemical reactions.
- understands and applies knowledge of interactions of energy and matter.
- understand and apply knowledge of conservation of energy and increase in disorder.
- demonstrate a sound understanding of technology concepts, systems and operations.
- apply digital tools to gather, evaluate, and use information.
- use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

AP PHYSICS I N

173621

GRADES: 10-12***PREREQUISITE: Algebra II & Geometry****1 CREDIT/2 TERMS**

AP® Physics 1 is the first course in a two course sequence for AP Physics. AP® Physics 1: Algebra-based and AP Physics 2: Algebra-based is a two-year sequence equivalent to the first and second semesters of a typical introductory, algebra-based, college physics course. This two year sequence gives teachers the time needed to foster greater depth of conceptual understanding through the use of student-centered, inquiry based instructional practices. There will be an AP exam available at the end of this course to help students earn college credit. Each of the two courses in the sequence will have their own individual AP exams.

Major Concepts:

- Objects and systems have properties such as mass and charge. Systems may have internal structure.
- Fields existing in space can be used to explain interactions.
- The interactions of an object with other objects can be described by forces.
- Interactions between systems can result in changes in those systems.
- Changes that occur as a result of interactions are constrained by conservation laws.
- Waves can transfer energy and momentum from one location to another without the permanent transfer of mass and serve as a mathematical model for the description of other phenomena.

AP PHYSICS II N

173623

GRADES: 10-12***PREREQUISITE: AP Physics I****1 CREDIT/2 TERMS**

AP® Physics 2 is the second course in a two course sequence for AP Physics. AP® Physics 1: Algebra-based and AP Physics 2: Algebra-based is a two-year sequence equivalent to the first and second semesters of a typical introductory, algebra-based, college physics course. This two year sequence gives teachers the time needed to foster greater depth of conceptual understanding through the use of student-centered, inquiry based instructional practices. This course will cover many of the topics from the first in the sequence, adding depth and additional concepts throughout the semester. There will be an additional AP exam available at the end of this course to help students earn college credit.

Major Concepts:

- Objects and systems have properties such as mass and charge. Systems may have internal structure.
- Fields existing in space can be used to explain interactions.
- The interactions of an object with other objects can be described by forces.
- Interactions between systems can result in changes in those systems.
- Changes that occur as a result of interactions are constrained by conservation laws.
- Waves can transfer energy and momentum from one location to another without the permanent transfer of mass and serve as a mathematical model for the description of other phenomena.

ASTRONOMY II N

176121

GRADES: 10-12***PREREQUISITE: Astronomy I****.5 CREDIT/1 TERM**

This course would be designed to be an extension of Astronomy I. The first 9-week class covers astronomical history, how we gather and interpret light from afar and studies each of the planets of the solar system, including Earth. Astronomy II students would be able to apply and extend this prior knowledge to study the theories involving our Sun, stellar lives and evolution, galaxies and the universe. Teaching strategies would continue to involve drawing on students' interests through discussion, multimedia presentations, labs, papers, projects and additional planetarium usage.

The students will:

- summarize the overall properties, structure and nature of the Sun.
- use the H-R diagram correctly in its many stellar applications.
- explain how original mass is related to most stellar properties.
- describe the differences in the evolutionary paths of stars of differing solar mass.
- understand how observational evidence supports the modern theories of star formation.
- compare and contrast the properties of stellar remnants.
- describe the overall structure of the Milky Way and how we came to attain this knowledge.
- explain the origin of the heavier elements and how they fit into stellar evolution.
- summarize the different types of galaxies, their distribution and evolution.
- describe "anti-matter" and background radiation and their significance.
- discuss the cosmological principle, the "big bang" and theories on universal evolution.
- evaluate the probability of existence of other life in the universe.

CHEMISTRY I N 172111 **GRADES: 10**
HONORS CHEMISTRY I N 172121
***PREREQUISITE: Biology 1 and Algebra 1** **.5 CREDIT/1 TERM**

This course assesses standards dealing with chemical reactions and atomic structure. There will be a second semester of chemistry offered as an elective for students

STANDARDS:

NGSS High School Physical Science Standards: [1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 2-6, 3-1, 3-2 & 3-4](#)
NGSS High School Engineering and Technology Standards: [1-1, 1-2, 1-3, & 1-4](#)

CHEMISTRY II **GRADES: 10-12**
HONORS CHEMISTRY II
***PREREQUISITE: Chemistry 1** **.5 CREDIT/1 TERM**

This is a course to follow Chemistry I for those students who want to enhance their chemistry background. It is recommended for the college bound student, especially those who want to continue in a science field.

STANDARDS: NGSS High School Physical Science Standards: [1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 2-6, 3-1, 3-2 & 3-4](#)
NGSS High School Engineering and Technology Standards: [1-1, 1-2, 1-3, & 1-4](#)

EARTH AND SPACE SCIENCE N 170121 **GRADE: 10-12**
HONORS EARTH AND SPACE SCIENCE N 170131 **GRADE: 10-12**
***PREREQUISITE: NONE** **.5 CREDIT/1 TERM**

This course covers topics in astronomy and plate tectonics. Students will focus on constructing explanations and developing models using mathematical computation and empirical evidence. Students will emphasize applying scientific reasoning to explanations and models of earth and space systems and how they are connected.

STANDARDS:

NGSS High School Earth and Space Science: [1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-8, 2-1 & 2-3](#)
NGSS High School Engineering and Technology: [1-1, 1-2, 1-3, & 1-4](#)

ENVIRONMENTAL SCIENCE N **GRADES: 10**
HONORS ENVIRONMENTAL SCIENCE N **GRADES: 10**
***PREREQUISITE: Biology 1** **.5 CREDIT/1 TERM**

This course deals with impacts of change on our environment. Students will develop mathematical models and form solutions to environmental issues. Students will plan and conduct at least one investigation into an environmental issue using their models. Students will evaluate arguments about what impacts certain actions have on the environment.

STANDARDS:

High School Earth Science Standards: [2-2, 2-4, 2-5, 2-6, 2-7, 3-1, 3-2, 3-3, 3-4, 3-5 & 3-6](#)
High School Life Science Standard: [2-7](#)
High School Engineering and Technology Standards: [1-1, 1-2, 1-3, & 1-4](#)

FORENSICS N 174141 **GRADES: 10-12**
***PREREQUISITE: Biology II, Chemistry or Physical Science** **.5 CREDIT/1 TERM**

Students in Forensic Science will learn the services of a crime laboratory and rules of processing evidence from a crime scene. Students will study methods of analyzing physical evidence including hair, fiber, glass, DNA, fingerprints, bone, and serology evidence.

The students will:

- understand and apply knowledge of the molecular basis of heredity.
- understand and apply knowledge of structure and properties of matter.
- understand and apply knowledge of chemical reactions.
- develop and display technology literacy, employability skills and civic literacy.

HONORS ANATOMY & PHYSIOLOGY N

171311

GRADES: 10-12***PREREQUISITE: Biology and Chemistry****1 CREDIT/2 TERMS**

This course is designed primarily for students who have an interest in pursuing one of the health related fields or biology as a career. The course contains the following topics: mammalian anatomy, digestive system, nutrition, circulatory system, excretory system, respiratory system, muscular-skeletal system, nervous system, and the reproductive system. Where practical, the students act as the laboratory test subjects. All students should have a well based understanding of mammalian anatomy and physiology as well as some knowledge of the improper functioning of human physiological activities upon completion of the course.

The students will:

- understand and apply knowledge of the cell.
- understand and apply knowledge of the behavior of organisms.

PHYSICS N

173111

GRADES: 10-12***PREREQUISITE: Algebra I & Geometry****1 CREDIT/2 TERMS**

This pre-college course is intended for students who plan to pursue any area of studies beyond high school. Science students will get the lab experiences they need for future classes while non-science students will get the general Physics background they need for college entrance. This course utilizes a wide variety of materials, equipment and experiences so widely differing interests may be met. Many experiments are completed and written up to follow standard scientific process standards. Computer interfacing, spreadsheet and graphic analysis are used throughout the course. Students obtain a good background in physics, along with an understanding of science as "one of the humanities".

The students will:

- understand and apply knowledge of the structure of atoms.
- understand and apply knowledge of the structure and properties of matter.
- understand and apply knowledge of motions and forces.
- understand and apply knowledge of conservation of energy and increase in disorder.
- understands and applies knowledge of interactions of energy and matter.
- understand and apply knowledge of energy in the earth system.
- demonstrate a sound understanding of technology concepts, systems and operations.
- apply digital tools to gather, evaluate, and use information.
- use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.