

SCIENCE COURSE OFFERINGS AND SEQUENCES

Please review this flowchart to determine which courses are right for your goals, grade level and grades in previous courses.

Courses should be chosen from the column which most suits your goals and needs. Make sure you meet the prerequisites for

the courses you want and obtain any teacher recommendations you need. All science courses are offered in both the Fall and Spring. All courses listed below are worth 1 Science credit, with the exception of the Advanced Placement courses which are worth 2 credits.

	Career Prep	College Prep	Honors
Grade 9 Science*	Earth Science	CP Earth Science	Honors Earth
Grade 10	Biology Ecology & Animal Behavior	CP Biology Ecology & Animal Behavior	Honors Biology*
Grade 11	Chemistry Ecology & Animal Behavior Forensics	CP Chemistry* CP Ecology & Animal Behavior	Honors Chemistry*
Grade 12	Physics Forensics Ecology & Animal Behavior	CP Physics Mechanics* CP Oceanography/Astronomy* CP Ecology & Animal Behavior	Honors Physics Mechanics* AP Biology* AP Chemistry* AP Physics B*

***This course has a specific prerequisite beyond completion of the previous year's course. Please refer to the course descriptions.**

- CP and Honors students who are planning to take AP Biology, AP Chemistry or AP Physics are encouraged to take more than one science course each year beginning with their freshman year. Students are encouraged to take more than four Science courses during their high school career. Ecology/Animal Behavior, Forensics and CP Oceanography/Astronomy are recommended for enrichment either after completing the Earth Science, Biology, Chemistry, Physics sequence, or concurrently with another science.
- As part of the curriculum, in every Science offering is a Common Lab Assessment (CLA). The CLA is designed to increase the writing skills of students. Career Prep Level courses require the completion 2 CLAs. College Prep Level courses require the completion of 2 CLAs. Honors and AP Level courses

require completion of 3 CLAs. Failure to complete these assignments will result in an incomplete grade for the course.

- Students who are planning to major in pre-med or a related area are strongly encouraged to take AP Chemistry.

The following courses are offered in the Agriculture program and have also been deemed Science Courses for those students in the Agriculture Program. See the Agriculture Section for Course Descriptions.

CP Veterinary Science
(Agriculture) Concepts of Biotechnology

SCIENCE

Earth Science 100

Grade 9

Prerequisite: Physical Science 8

This semester course is a general course in Earth Science for ninth grade students who do not have a strong aptitude in science or math. Concepts in physical geology, hydrology, earth-sun relationships, and weather are studied. This course is recommended for students who intend to enter the working world or pursue technical or business training. **2 CLAs will be completed.**

College Prep Earth Science 101

Grade 9

Prerequisite: A minimum grade of “B” in Physical Science 8

This semester course in Earth Science is designed for ninth grade students who have a strong aptitude in science or math. In-depth studies, data analysis, problem solving and project assignments emphasize concepts in physical geology, hydrology, earth-sun relationships, and meteorology. This course is recommended for all students planning to attend college, regardless of their major. This course is a must for anyone who is planning to major in science, math, or technology in college. **2CLAs will be completed.**

Honors Earth Science 102

Grade 9

Prerequisite: Minimum grade of “B” in Eighth Grade Algebra I and minimum grade of “A” in Physical Science 8

This course is similar in content to College Prep Earth Science but has an increased emphasis on higher level thinking and mathematics. The lab portion of this class is fundamentally the same as C.P. Earth Science; however, there is an increased emphasis on math and computer skills. Honors Earth Science involves more depth and breadth of the content with an introduction to Astronomy and Oceanography. Students must have a strong background in math and science along with a strong motivation to learn. Scientific technical writing skills applied to formal lab reports will be stressed. **3 CLAs will be completed.**

Biology 103**Grade 9, 10, 11, 12****Prerequisite: Earth Science**

This course is a study of Life Science for students who do not have a strong aptitude in math or science. This course includes topics in the nature of science, basic life chemistry, cells, genetics and ecology. **2 CLAs will be completed.**

College Prep Biology 104**Grade 9, 10, 11, 12****Prerequisite: Minimum grade of “C” in CP Earth Science, or minimum grade of “B” in Earth Science**

This course in Biology is for students with a demonstrated aptitude in math and science. This course is also designed for the college-bound student who intends to major in something other than a scientific field. Course material includes in-depth studies of the nature of science, basic nature of life, life chemistry, cell structure, cell reproduction, genetics and ecology. **2CLAs will be completed.**

Honors Biology 105**Grade 9, 10, 11, 12****Prerequisite: Minimum grade of “A” in CP Earth Science, or minimum grade of “B” in Honors Earth Science**

This course in Biology is for students with a high aptitude for science and math. It is designed for the college-bound student who plans to major in a scientific field. Topics include the nature of life, life chemistry, cell structure, cell reproduction, ecology, and genetics. Scientific technical writing skills applied to formal lab reports will be stressed. **3 CLAs will be completed.**

Chemistry 107**Grade 10, 11, 12****Prerequisite: Biology, Minimum grade of "C" in Algebra 1.**

This is a course in basic chemistry and its applications to the personal and professional lives of people. It is designed to help students think more intelligently about current issues they will encounter that involve science and technology. This chemistry course should be selected by students who are going on to a trade school, two-year college, business school, non-science majors in college, or by students not going beyond high school. **2 CLAs will be completed.**

College Prep Chemistry 108**Grade 10, 11, 12****Prerequisite: Minimum grade of “C” in CP Biology, or minimum grade of “B” in Biology and minimum grade of “C” in CP Algebra I**

Chemistry is a physical science dealing with the structure, composition and properties of matter along with the changes matter undergoes. Atomic and molecular structure, chemical nomenclature, and reactions as well as the study of gases and solutions are studied through brief lectures,

and application activities in the lab. Because of the quantitative aspects of chemistry, a strong math background is highly recommended. This semester course is designed for students who are planning to enter college and take courses in science or technology. **2CLAs will be completed.**

Honors Chemistry 109

Grade 10, 11, 12

Prerequisite: Minimum grade of "A" in CP Biology, or minimum grade of "B" in Honors Biology and minimum of "B" in CP Algebra I

This course is similar in content to College Prep Chemistry but is more rigorous. There is exposure to use of some special lab techniques and instrumentation not covered in College Prep Chemistry. Honors Chemistry involves more depth and breadth of content. Scientific technical writing skills applied to formal lab reports will be stressed. This course requires that the student have a strong background in math and science along with a strong motivation to learn. Successful completion of the course prepares the student for the A.P. Chemistry course or any introductory college chemistry course. **3 CLAs will be completed.**

Physics 110

Grade 11, 12

Prerequisite: Minimum grade of "B" in Biology. Minimum grade of "C" in Geometry

This course is a study of the concepts of physics as they relate to things and events that are familiar in the everyday environment. This course is recommended for students who have an interest in the "real-world" science of physics but do not have a strong aptitude in math. **2 CLAs will be completed.**

College Prep Physics of Mechanics 111

Grade 11, 12

Prerequisite: Minimum grade of "C" in CP Biology and minimum grade of "C" in CP Algebra II, or Algebra III – Trig., or CP Geometry/Trig

Mechanics is a branch of physics dealing with the study of motion and its causes. Classical mechanics and dynamics include motion – linear and non-linear (projectile, circular, and rotary), forces and thermodynamics. Due to the quantitative nature of physics, a strong math background is highly recommended. This course is designed for students who are planning to enter college and take courses in science, engineering, medicine, or technology. **2CLAs will be completed.**

Honors Physics of Mechanics 112

Grade 10, 11, 12

Prerequisite: Minimum grade of "C" in Honors Biology, or minimum grade of "A" in CP Biology and minimum grade of "B" in CP Algebra II, or CP Geometry/Trig.

This course is similar in content to College Prep Physics of Mechanics but is more rigorous. Scientific technical writing skills applied to formal lab reports will be stressed. Honors Physics involves more depth and breadth of content than College Prep

Physics. This course requires that the student have a strong background in math and science along with a motivation to learn. **3 CLAs will be completed.**

College Prep Physical Oceanography and Astronomy 116

Grade 11, 12

Prerequisite: Biology, Minimum grade of “C” in CP Biology, or minimum grade of “B” in Biology, and minimum grade of “B” in CP Algebra II

This course deals with physical and geological characteristics of the world's oceans. Animal behavior of marine life and coastal dynamics is covered. Emphasis is placed on navigation and movements of the oceans. Laboratory and field studies include mapping, data collection and analysis. Each class has an opportunity to take introduction to scuba lessons. Astronomy is designed to open the mind as well as the eyes by hands-on observation and thought provoking discussion on the solar system through the universe. **2CLAs will be completed.**

Ecology of the Susquehanna River and Chesapeake Bay Environment & Animal Behavior 117

Grade 10, 11, 12

Prerequisite: Biology

This course consists of two parts. One part investigates aquatic ecosystems located in the Chesapeake Bay watershed. Students study the organisms found in the fresh and saltwater habitats within our region as well as the effects that agriculture, technology and lifestyle have on the quality of the environment. Emphasis is placed on fresh water and marine biology, fieldwork, independent research and project work. The other part of the course is about Animal Behavior. Students will learn how ethologists work, study classic experiments, and gain an understanding about innate and learned behaviors. Participants will design, conduct and analyze experiments to discern specific behaviors of animals. **2 CLAs will be completed.**

The ecology component of the course involves mandatory participation in field trips to a local stream, pond and waste water treatment plant. There may be a nominal charge to cover transportation. Students may opt to participate in a sailing trip on the Chesapeake Bay for an additional fee.

College Prep Ecology of the Susquehanna River and Chesapeake Bay Environment & Animal Behavior 118

Grade 10, 11, 12

Prerequisite: College Prep Earth Science, and minimum grade of “B” in College Prep or Honors Biology

This course is designed for the college bound student with strong interests in the natural sciences. The course consists of two parts. One part investigates aquatic ecosystems located within the Chesapeake Bay Watershed. Students will study the organisms found in the fresh water and salt water habitats within our region as well as the effects that agriculture, technology and lifestyle have on the quality of the environment. Emphasis is placed on fresh water and marine biology, field work, independent research and project work. Students will also delve into the natural and human history of the region by reading the novel Chesapeake by James A. Michener. The other part of the

course is about Animal Behavior. Students will learn how ethologists study animals in the field, study classic experiments and gain an understanding about innate and learned behaviors. Participants will design, conduct and analyze experiments to discern specific behaviors of animals. **2CLAs will be completed. The ecology component of the course involves mandatory participation in field trips to a local stream, pond and waste water treatment plant where there may be a nominal charge to cover transportation. Students may opt to participate in a sailing trip on the Chesapeake Bay for an additional fee.**

Forensic Science 098

Grade 11, 12

Prerequisite: Earth Science and Biology

The Forensic Science course is designed for students with a curiosity as to how science helps the law. Forensic Science is a multidisciplinary class, pulling in skills from Life Sciences, Chemistry, Physics, Technology, Math, Earth Science, Language Arts and Social Studies. Students will participate in hands on-activities, involved in the process of solving crimes and mysteries with the use of science skills. This semester course is recommended for those students who are going to a trade school, two year college, business school, non- science majors in college or by students not going beyond high school education. This course requires that the students have a strong work ethic, patience to solve problems and puzzles, and a high motivation to learn. **2 CLAs will be completed.**

A.P. Biology/Technology and Research 119

Grade 11, 12

Prerequisite: Minimum grade of “A” in College Prep Biology or minimum grade of “B” in Honors Biology College Prep or Honors Chemistry, College Prep or Honors Physics (Physics may be taken in the same year as this course assuming all other prerequisites are met.)

The AP Biology course is designed to be the equivalent of a two-semester college introductory biology course usually taken by biology majors during their first year. AP Biology includes those topics regularly covered in a college biology course for majors. It aims to provide student with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology.

Students who complete this class will earn two weighted credits. In order to earn AP weighted credit, students must take the Advanced Placement examination in May. **Summer Work Required. 4 CLAs will be completed.**

A.P. Chemistry/Technology and Research 120

Grade 11, 12

Prerequisite: Minimum grade of “A” in College Prep or Honors Biology, College Prep Chemistry or minimum grade of “A” in Honors Chemistry , College Prep or Honors Physics (Physics may be taken in the same year as this course assuming all other prerequisites are met.), minimum grade of “B” in Honors Math Analysis , or minimum grade of “B” College Prep Precalculus

Advanced Placement Chemistry covers the equivalent of a full year college-level course. It is designed to allow students further study in such topics as the property-structure relationships of substances, gases, stoichiometry and solutions as well as delving into the more dynamic studies of thermodynamics, chemical equilibrium and kinetics, as well as electrochemistry and organic chemistry. The full year time frame allows more time for the application and exploration of new concepts in the laboratory, as well as time to develop proper lab techniques including data collection, analysis and presentation in formal reports. Technical writing skills applied to formal lab reports will be stressed. Students who complete this class will earn two weighted credits. In order to earn AP weighted credit, students must take the Advanced Placement examination in May. **Summer Work Required. 4 CLAs will be completed.**

A.P. Physics B 097

Grade 11, 12

Prerequisite: Minimum grade of “B” in College Prep or Honors Earth Science. Minimum grade of “B” in College Prep or Honors Biology. Minimum grade of “B” Honors Math Analysis or CP Precalculus. Concurrent enrollment in Honors Calculus highly recommended.

Advanced Placement Physics is the equivalent of a full year college-level physics course. This course provides a systematic approach to the foremost principles of physics and emphasizes the development of problem solving skills using algebra, trigonometry, and basic calculus principles. This full-year course is designed to thoroughly explore and investigate applications of new principles in a laboratory setting to enhance techniques including focus, data collection, analysis, and presentation in formal reports. The content will include Newtonian Mechanics; Fluid and Thermal Mechanics; Electricity and Magnetism; Waves and Optics; and Atomic and Nuclear Physics. Students who complete this class will earn two weighted credits. In order to earn AP weighted credit, students must take the Advance Placement examination in May. **Summer Work Required. 4 CLAs will be completed.**

**All CLA's are required for all courses. Failure to complete a CLA will result in an Incomplete "I" for the course and will be changed to a failure "F" at the end of the semester if the CLA is not completed.