

# SCIENCE

Course Name	9	10	11	12
Biology	R	R		
Biology – Honors	E			
Chemistry 1		E	E	E
Chemistry 1 – Honors *		E	E	E
Physics 1		E	E	E
Chemistry 2: Inorganic *			E	E
Chemistry 2: Organic *			E	E
Physics 2: Electricity and Magnetism *			E	E
Physics 2: Waves, Sounds, and Light *			E	E
Earth and Space Science			E	E
Forensic Science			E	E
Youth Apprenticeship			E	E
E = Elective Course      R= Required Course      * = Honors Course				

## **Biology**

*1.0 Credit: Yearlong*

*Prerequisite: None*

This course is designed to increase knowledge about yourself and the living world around you. Topics include cells, microbiology, genetics, evolution and environmental attitudes. Lab exercises and class activities are included to increase understanding of the topics.

## **Biology - Honors**

*1.0 Credit: Yearlong*

*Prerequisite: None*

This course places greater emphasis on the development of scientific concepts through independent lab work and class activities at an accelerated pace. Students will complete a large in independent research project during the class and will defend their research to an identified panel of judges. This course is designed to increase knowledge about yourself and the living world around you. Topics include cells, microbiology, genetics, evolution and environmental attitudes. Lab exercises and class activities are included to increase understanding of the topics.

## **Chemistry**

*1.0 Credit: Yearlong*

*Prerequisite: Successful completion of Biology and Algebra 1*

Chemistry deals with the interaction of matter and energy, atomic structure, chemical reactions, and bonding. Chemistry requires good problem-solving skills and a strong mathematical background. Chemistry is needed in the fields relating to medicine, engineering, manufacturing, environment, and agriculture. Chemistry 1 explores the topics of density, properties and changes of matter, the atom, periodic trends, chemical formulas and reactions, the mole and stoichiometry, solutions, thermodynamics, and the gas laws.

## **Chemistry - Honors**

*1.0 Credit: Yearlong*

*Prerequisite: Successful completion of Biology-Honors or Biology teacher recommendation- and Algebra 1*

Chemistry deals with the interaction of matter and energy, atomic structure, chemical reactions, and bonding. Chemistry requires good problem-solving skills and a strong mathematical background. Students with questions about the mathematical skills needed for chemistry are advised to contact their science teacher about any concerns they may have. The course also provides the student with a strong pre-college background. This class emphasizes lab work, and analyzing lab data. Chemistry is needed in the fields relating to medicine, engineering, manufacturing, environment, and agriculture. Chemistry-Honors explores in depth the topics of the atom, periodic trends, chemical formulas and reactions, the mole and stoichiometry, solutions, thermodynamics, and the gas laws. Note: Completion of Chemistry-Honors is recommended for preparation for college-level science majors. Students who are recommended by Biology or Biology-Honors teachers may begin their chemistry studies with Honors Chemistry with the math prerequisites.

## **Physics**

*1.0 Credit: Yearlong*

*Prerequisite: Successful completion of Algebra 1 and Geometry & concurrent enrollment in Algebra 2*

This course lays a foundation of the basic mathematics and science principles which will be used to study motion, gravity, force, and energy. The course is a blend of theory, application and lab work, allowing the student to develop creatively within a structured course. Since many of the concepts will be subjected to rigorous mathematical treatment, students taking this course should have a strong background in algebra, geometry, and problem-solving skills. They should have a solid background in solving algebraic equations and second degree polynomials, should be familiar with basic elements of geometry (especially triangles) and trigonometry, should be able to find areas of polygons, should be comfortable making metric conversions and in using scientific notation, and should be able to make graphs and take slopes of lines on graphs. A calculator TI82/83 or better is required. It is recommended students have previously or are concurrently taking Algebra 2, College Prep Math, Probability and Statistics, Trigonometry OR Pre-Calculus.

## **Chemistry 2: Inorganic – Honors** (offered in 2023-2024)

*1.0 Credit: Yearlong*

*Prerequisite: Chemistry with a B or higher (C in Honors Chemistry), AND completion of Algebra 2*

Chemistry 2-Inorganic chemistry is recommended for students planning to pursue a career in science, engineering or medicine. The material covered is typical in both content and level of difficulty to material found in a first-year college chemistry course. The mathematical treatment of problems will be challenging and in many cases, one lab experiment will be performed per week with major formal lab reports due at least once each unit. Topics of study will include Oxidation-Reduction Reactions, Kinetics, Thermochemistry, Equilibrium, Acid-Base Chemistry, Electrochemistry, Energy and entropy, Nuclear chemistry, Electrochemistry, and Advanced quantitative laboratory techniques.

## **Chemistry 2: Organic – Honors** (offered in 2022-2023)

*1.0 Credit: Yearlong*

*Prerequisite: Chemistry with a B or higher (C in Honors Chemistry), AND completion of Algebra 2*

Chemistry 2-Organic chemistry is recommended for any students planning to pursue a career in science, engineering or medicine. The material covered is typical in both content and level of difficulty to material found in a first-year college chemistry course. Organic chemistry is a required college course for majors in the science or medical fields, and this course is designed to give you early exposure to the topics. Topics covered in this class will include functional groups and their interactions, IUPAC naming rules, isomers, resonance structures, addition reactions, and synthesis reactions.

## **Physics 2 - Honors**

Honors Physics 2 courses are recommended for students planning a career in engineering and/or the sciences. The material covered is typical of that found in a first year, non-calculus college physics course. The mathematical treatment of problems and pace will be rigorous and research and design activities play an important role in these courses. Students may elect to take one or both courses. They are independent of one another, but taking both (in combination with successful completion of Physics 1) students will have covered the material typical of an AP Physics course.

### **Physics 2: Electricity and Magnetism – Honors**

*0.5 Credit: Semester*

*Prerequisite: Successful completion of Physics 1*

This course provides students with an in-depth look at electricity including static and dynamic electricity, design, construct and test circuits, and explore magnetism and characteristics of magnetic materials.

**Physics 2: Waves, Sound, and Light - Honors** 0.5 Credit: Semester

*Prerequisite: Successful completion of Physics 1*

This course provides students with an in-depth look at wave properties, mechanical waves including sound, EM waves, reflection, refraction and diffraction properties.

**Earth and Space Science**

0.5 Credit: Semester

*Prerequisite: Successful completion of Biology, Chemistry and Algebra 1*

Students will learn earth science concepts related to the structure of Earth and the behavior of Earth systems. Topics include geology concepts, such as weathering and erosion, weather and climate, as well as the role of oceans in the function of Earth systems. The fossil record and plate tectonics will also be explored. The second half of the semester will focus on space science concepts, including but not limited to space exploration, instrumentation and technology, laws of planetary motion and their impact on the formation of the universe and solar system. Some basic math knowledge will be required when calculating planetary distances, so a calculator is encouraged. This course is heavily reliant upon laboratory and research skills, but will often focus on theoretical concepts.

**Forensic Science**

0.5 Credit: Semester

*Prerequisite: Successful completion of Biology and Chemistry*

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 an unknown. Students will learn how DNA, fingerprinting, blood typing, entomology, anthropology and other forensic tests can be used to solve a crime. This course is heavily reliant upon laboratory and research skills. Due to the sensitive nature of some topics, this course will require parent/guardian signature within the first few days of the course.