



**Pre-Requisite:** *Earth and Space Science or Honors Earth and Space Science and Algebra II concurrent. Teacher Recommendation Required.*

**Description:** This course is designed for students who are planning to pursue careers in science. Chemistry Honors is taught at a faster rate and deeper level than the regular sections of Chemistry. Chemistry is the advanced study of matter, its composition and its changes. This course is designed to prepare a student for AP Chemistry and requires a strong mathematical base. The relationship between chemistry concepts and mathematics will be emphasized. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills.

### **Earth Science-620100**

**Grade Level: 10-12**

**Credit: 1**

**Description:** The grade 10-12 elective Earth Science course will assist in understanding the fundamentals of earth science that includes geology, oceanography, meteorology and astronomy. This course is designed to build on knowledge, skills, and dispositions developed during the science progression, which approached science in a rigorous and integrated manner including the traditional disciplines of biology, chemistry, and physics where appropriate. Students will engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities.

### **Honors Physics-60410H**

**Grade Level: 10-12**

**Credit: 1**

**Pre-Requisite:** *Earth and Space Science or Honors Earth and Space Science, Trigonometry (concurrent), Teacher Recommendation Required*

**Description:** An advanced level course designed for students who have completed Physical Science and desire a broader, in-depth study of the content found in the science field of physics. As a college preparatory course, Advanced Physics is a laboratory driven, advanced study of nature's universal laws with emphasis on process skills, using 21<sup>st</sup> century skills. This course is designed to build upon and extend the Physics concepts, skills, and knowledge from the science program. The course emphasizes a mathematical approach to the areas of kinematics, dynamics, thermodynamics, light and optics, electricity and magnetism and modern physics. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities.

### **Human Anatomy and Physiology-610300**

**Grade Level: 11-12**

**Credit: 1**

**Pre-Requisite:** *Earth and Space Science or Honors Earth and Space Science, Biology or Biology Honors, and Chemistry or Chemistry Honors with a minimum grade of 'B' in each.*

**Description:** Human Anatomy and Physiology is designed for those students wanting a deeper understanding of the structure and function of the human body. The body will be viewed as a whole using anatomical terminology necessary to describe location. Focus will be at both micro and macro levels reviewing cellular functions, biochemical process tissue interactions, organ systems and the interaction of those systems as it relates to the human organism. Systems covered include integumentary, skeletal, muscular, respiratory, circulatory, digestive, excretory, reproductive, immunological, nervous and endocrine. This course will develop 21<sup>st</sup> Century skills and be appropriate for college bound students as well as those choosing a health services career cluster. Students will engage in active inquiries, investigation, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills.

### **Microbiology-606100**

**Grade Level: 12**

**Credit: 1**

**Pre-Requisite:** *Honors Biology, Honors Chemistry, and AP Biology with a minimum grade of "A" in Honors Biology and Honors Chemistry and a minimum grade of "B" in AP Biology*

**Description:** Microbiology is designed to continue student investigation that began in grades K-8 and high school biology and chemistry. The curriculum is extensively performance and laboratory based. It integrates the study of microbial physiology, ecology, and genetics with instruction focusing on the impact microorganisms have on health, agriculture, biotechnology and the environment. Areas of study include classification of microorganisms; cellular structure and function; metabolic diversity; microbial genetics; control of microbial growth; microbial ecology, biotechnology and applied microbiology; and host-microbe interactions. Careers related to medicine, health-care,

research, food science and biotechnology should be emphasized throughout the curriculum. Real-life applications should be emphasized through case studies concerning diseases; epidemiology; food preparation and safety; and use of microbes in industry, agriculture, biotechnology and the environment.

### **AP Biology-61210H**

**Grade Level: 11-12**

**Credit: 1**

**Pre-Requisite:** *Biology Honors with a minimum grade of 'B', Teacher Recommendation Required.*

**Description:** The AP Biology course is the equivalent of a two-semester introductory biology course for biology majors in college and reflects the outline provided by the College Board. The course will include those topics regularly covered in a college introductory biology course and differs significantly from the standards-based, high school biology course with respect to the kind of textbook used, the range and depth of topics covered, the kind of laboratory work performed by the students, and the time and effort required of the students. AP Biology is a course that aims to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. The AP Biology Curriculum is frame around four Big Ideas. For each of these Big Ideas, there is a set of core concepts called Enduring Understandings which will be used to guide the AP Biology course curriculum.

### **AP Chemistry-63210H**

**Grade Level: 10-12**

**Credit: 1**

**Pre-Requisite:** *Chemistry Honors or Chemistry with Teacher Recommendation and a minimum grade of "B", Algebra II (Trigonometry is strongly recommended), Teacher Recommendation Required.*

**Description:** Topics covered are Modern Atomic Theory, Structures of Bonding of Matter, Kinetic and Thermodynamics Theory, Electrochemistry, Reaction Rates Equilibrium, Organic Chemistry, Descriptive Chemistry as well as Laboratory safety and techniques. Algebra is a major portion of the course but reading of the college level text is also important. This course is highly recommended for those students who are interested in taking AP Physics and those who are going to major in science in college.

### **AP Environmental Science-62210H**

**Grade Level: 10-12**

**Credit: 1**

**Pre-requisites:** *10th grade: Honors Earth and Space Science with an end-of-year grade of an 'A' and Honors Biology concurrent. 11th-12th grade: Honors Earth and Space Science and Honors Biology with a minimum grade of a 'B' in each. Teacher recommendation required for all students.*

**Description:** The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them. Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. Yet there are several major unifying constructs, or themes, that cut across the many topics included in the study of environmental science. The following themes provide a foundation for the structure of the AP Environmental Science course.

### **Forensic Science-604400**

**Grade Level: 10-12**

**Credit: 1**

**Pre-requisite:** *All students had to have passed Earth and Space Science or Honors Earth and Space Science and be taking biology concurrently if they have not already taken it so that required courses are addressed before this elective is scheduled.*

**Description:** Forensic science is a course designed to provide students with hands-on experiences in various aspects of a criminal investigation. Students will not only learn the basic protocols, but also the details used in forensics by engaging students in active inquiries and hands-on activities. This course will expose students to forensic-related careers and other occupational opportunities in science, while also teaching them how the world of forensic science has changed over the years.

### **Experimental Design-636800**

**Grade Level: 11-12**

**Credit: 1**

**Pre-requisite:** *Earth and Space Science or Honors Earth and Space Science, Biology/Honors Biology with a grade of 'B' in each, or a grade of 'C' with a teacher recommendation.*

**Description:** This course is designed for college-bound students who are interested in pursuing a science degree or career and is intended to be a more intensive look at thorough research methods and experimental design. Students will learn the fundamentals of real-life research in the classroom and use available technology to design several long-term research projects that will be conducted outside the classroom throughout the year. This course will include research, data analysis, formal data reporting, and presentation aspects with at least 50% of the time dedicated to actual field research (remember that this might include windy, rainy, hot, or cold weather at times). Safety instruction is integrated into all activities. Students must have strong writing skills to succeed in this course.