SCIENCE

EARTH SCIENCE OFFERINGS

ASTRONOMY - 5150 ½ credit

Astronomy is a .5 credit, semester long course. It is a conceptual course rather than a math based course. It is meant as a half credit of science for juniors and seniors which are not going to major in science in college and who need an option of science that is less math based than physics or chemistry courses. The semester of Astronomy will start with observations of the Earth's movements and place in space and then continue with our Moon, the Solar System, the Sun, stars and their evolution. Space phenomena within and beyond the Milky Way galaxy are also covered.

This course if <u>not</u> available to students who have completed CMIC III or higher without counselor/instructor approval.

Math Prerequisite	Science prerequisite	Offered to grades
Current enrollment in CMIC III or **LOWER**	none	11,12

EARTH SCIENCE I – 5910 1 credit

Earth science is a course that includes topics from the disciplines of geology, basic astronomy, oceanography and meteorology and the earth's environment in space… Topics of geology within this course include the theory of plate tectonics and its effects. Rocks and minerals are studied in a lab environment in which students will be able to analyze their characteristics to determine their origin and type. Other topics include processes that shape the land. Additionally, Earth's geologic history and time scale will be examined including the formation of fossils. Topics in astronomy include Earth's motions, our moon, the sun as a star, and other phenomena within our solar system. Topics in oceanography include the origin and continuing evolution of the ocean basins, air-sea and land-sea interactions, and life in the oceans. Our final topic for this course will be meteorology; the study of the interaction of the Earth's atmosphere with the land, oceans, and life on Earth. This class will focus on the basic physical concepts of weather and climate, the relationship between atmospheric processes and a variety of other aspects of our physical environment. Throughout this entire course we will also study natural disasters that affect the Earth including; hurricanes, tornadoes, floods, tsunami, earthquakes, and volcanoes.

Math Prerequisite	Science Prerequisites	Offered to grades
Concurrent enrollment in CMIC II or **LOWER**	none	10, 11,12

LIFE SCIENCE OFFERINGS

BIOLOGY – 5020 **1 credit**

How does your body use the foods you eat? How does you body maintain its temperature? How does energy flow through ecosystems? These and other life science-based questions are answered in Biology. Scientific investigative skills, evolution, homeostasis, energy, matter and organization, reproduction and inheritance, and ecology are studied in this year-long biology course. Biology courses are designed to provide information regarding the fundamental concepts of life and life processes. These courses include (but are not restricted to) such topics as cell structure and function, general plant and animal physiology, genetics, and evolution and ecology. ** *May be taken beyond 9th grade with administrative approval only*.

Math Prerequisites	Science Prerequisites	Offered to grades
none	none	9

CP BIOLOGY – 5026 **1 credit**

This year-long, college-prep course covers the same content as Biology in greater breadth and depth, including a greater emphasis on the mathematical and chemical basis for biological concepts. Students should expect daily homework. This is a rigorous course designed to prepare students for the AP level curriculum. Dissections will be performed.

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This course is suggested for students with demonstrated proficiency in English Language Arts and Math.
** *May be taken beyond 9th grade with administrative approval only*.

Prerequisites	Science Prerequisites	Offered to grades
Grade level proficiency in Math and English Language Arts	none	9

AP BIOLOGY - 5030 **1 credit**

AP Biology is designed to be the equivalent of a two-semester college introductory biology course usually taken by biology majors during their first year. After showing themselves to be qualified on the AP Exam, some students in their freshman year are permitted to undertake upper-level courses in biology or to register for courses for which biology is a prerequisite.

The AP Biology course is designed to be taken by students after the successful completion of a first course in high school biology and one in high school chemistry as well. It aims to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. Accordingly, goals have been set for percentage coverage of three general areas:

I. Molecules and Cells, 25%
II. Heredity and Evolution, 25%
III. Organisms and Populations, 50%

The two main goals of AP Biology are to help students develop a conceptual framework for modern biology and an appreciation of science as a process **Students are required to complete the AP exam at the end of the course.** AP Biology courses stress basic facts and their synthesis into major biological concepts and themes. These courses cover three general areas: molecules and cells (including biological chemistry and energy transformation); genetics and evolution; and organisms and populations (i.e., taxonomy, plants, animals, and ecology). AP Biology courses include college-level laboratory experiments.

Math Prerequisites	Science Prerequisites	Offered to grades
none	A or B in Biology & Chemistry or Consent of instructor	11-12

ENVIRONMENTAL SCIENCE - 5201 **1/2 credit**

Environmental Science courses examine the mutual relationships between organisms and their environment. In studying the interrelationships among plants, animals, and humans, these courses usually cover the following subjects: photosynthesis, recycling and regeneration, ecosystems, population and growth studies, pollution, and conservation of natural resources. Environmental Science enables students to develop an understanding of natural and man-made environments and environmental problems the world faces. A glance at the daily newspaper establishes instant relevance: global warming, over-population, endangered species, natural resource depletion, etc. This course will explore the fundamental ecological principles through an inquiry-based approach. Embedded standards for Inquiry, Technology & Engineering are taught in the context of the content standards for Earth Systems, The Living World, Human Population, Water and Land Resources, Energy Resources and Consumption, Pollution and Waste Production, Global Change, and Civic Responsibility.

Math Prerequisites	Science Prerequisites	Offered to grades
none	none	11-12

AP ENVIRONMENTAL SCIENCE – 5205 **1 credit**

AP Environmental Science courses are designed by the College Board to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, identify and analyze environmental problems (both natural and human made), evaluate the relative risks associated with the problems, and examine alternative solutions for resolving and/or preventing them. Topics covered include science as a process, ecological processes and energy conversions, earth as an interconnected system, the impact of humans on natural systems, cultural and societal contexts of environmental problems, and the development of practices that will ensure sustainable systems. AP Environmental Science is designed to be the equivalent of a one-semester, introductory college course in environmental science This is an interdisciplinary class. This course does include a laboratory and field component to allow the students to learn using firsthand observations and allow them to test concepts and principles that are introduced in the classroom. **Students are required to complete the AP exam at the end of the course.**

Math Prerequisites	Science Prerequisites	Offered to grades
none	A or B in Biology & Chemistry or Consent of instructor	11-12

FORENSIC SCIENCE – 5220 **1 credit**

Have you ever wondered how blood type is determined and matched to a suspect in a criminal case? Are you interested in DNA fingerprinting, crime scene investigation, blood spatter or collecting trace evidence? These topics and many more will be part of this year-long Forensic Science course. This class will consist of an in-depth exploration of the science skills and criminalistics of the field of forensic science. Forensic investigation, evidence collection and analysis will all be covered in this laboratory-based class. Forensics Science will also explore concepts in serology, death investigation, fingerprinting, and toxicology. This course integrates concepts in Biology, Chemistry, Physics, Geology, Anthropology, Psychology, and Law and is limited to12th grade students that have completed two years of science.

Math Prerequisites	Science Prerequisites	Offered to grades
none	2 years of high school science	12th ONLY

CP ANATOMY AND PHYSIOLOGY – 5035

1 credit (½ credit Science, ½ credit P.E.)

(P.E. – 4400)

CP Anatomy and Physiology is a course designed for students interested in learning about their body's structure and function through integrated hands on projects and activities. Usually taken after a comprehensive initial study of biology, Anatomy and Physiology courses present the human body and biological systems in more detail. In order to understand the structure of the human body and its functions, students learn anatomical terminology, explore functional systems (skeletal, muscular, circulatory, respiratory, digestive, nervous, and so on….8 of the 11 body systems will be covered in depth). Class activities at Horizon will consist of lectures, group and individual work, a variety of dissections including a complete dissection of a mink, lab projects, movement analysis, fitness assessments, and completing an exhibition project. These skills are designed to help students prepare for post high school experiences. This course is recommended for students interested in pursuing careers in medical, health or sports medicine related fields.

Math Prerequisites	Science Prerequisites	Offered to grades
none	Completed Biology or Chemistry	11-12

PHYSICAL SCIENCE OFFERINGS

CHEMISTRY – 5070 **1 credit**

This course is an in depth study of the structure and chemical behavior of matter. Students investigate chemical reactions and the structure of atoms and molecules. Topics include, properties and classification of matter, atomic structure, periodic table and trends, bonding, chemical reactions, stoichiometry, solutions, acid-base reactions, kinetics and thermochemistry. This course has a strong emphasis on theoretical and mathematical application of chemical concepts and principles and therefore only recommended for those students with solid math skills, work ethic, and an interest in engineering, medicine, and mathematically-related fields.

Math Prerequisites	Science Prerequisites	Offered to grades
Completed CMIC I	none	10,11,12

CP CHEMISTRY – 5080 1 credit

This course is an in depth study of the structure and chemical behavior of matter. Students investigate chemical reactions and the structure of atoms and molecules. Topics include, properties and classification of matter, periodic table and trends, bonding, chemical reactions, stoichiometry, gas laws, solutions, acid-base, thermochemistry, and oxidation/reduction, and nuclear chemistry. This course has a strong emphasis on theoretical and mathematical application of chemical concepts and principles and therefore only recommended for those students with solid math skills, work ethic, and an interest in engineering, medicine, and mathematically-related fields.

Math Prerequisites	Science Prerequisites	Offered to grades
Completed CMIC II	none	10,11,12

AP CHEMISTRY - 5075 **1 credit**

This is a rigorous extension of CP Chemistry. This course follows the curricula recommended by the College Board and conducts laboratory experiments equivalent to college courses. This course will encompass topics included in the college course such as atomic theory, bonding, stoichiometry, acid-base, thermodynamics, reaction kinetics, solutions, chemical equilibrium, etc. Students should be prepared to devote approximately 10 hours per week outside of class doing homework and studying. Students are required to complete the AP exam at the end of the course and can earn college credit for scores of 3, 4, or 5 (varies with different colleges).

Math Prerequisites	Science Prerequisites	Offered to grades
CMIC IV or Trig Pre Calculus	"A" or "B" in C.P. Chemistry AND CMIC IV or Trig Pre-calculus or consent of instructor	11-12

PHYSICS I – 5100 **1 credit**

Physics courses involve the study of the forces and laws of nature affecting matter, such as motion, momentum, and the relationships between matter and energy. The study of physics includes examination of sound, light, and magnetic and electric phenomena. This is an introductory algebra based physics course where students will explore the behavior of the natural world through hands-on projects, computer simulations, experiments and competitions. This course is NOT intended for those students who are considering future work in college in a technical field or continuing in further high school physics classes.

Math Prerequisites	Science Prerequisites	Offered to grades
Concurrent enrollment in CMIC III or IV or Algebra I (Not recommended for those in Calculus or Trigonometry)	none	10, 11, 12

CP PHYSICS - 5105 **1 credit**

This trigonometry based course helps students explain and find applications of nature's physical laws. Physics courses involve the study of the forces and laws of nature affecting matter, such as equilibrium, motion, momentum, and the relationships between matter and energy. The study of physics includes examination of sound, light, and magnetic and electric phenomena. Students will learn the secrets of the universe: how gravity works, what light is made up of, how rainbows and sonic booms are formed and how to shoot blow darts with amazing accuracy. The answer is always mathematical. This class is strongly recommended for students interested in engineering, medicine, and mathematically related fields.

Math Prerequisites	Science Prerequisites	Offered to grades
Completed OR current enrollment in Trig/Pre-Calculus	none	10,11,12

AP PHYSICS – 5111 **1 credit**

This course is designed by the College Board to parallel college-level physics courses that serve as a foundation for science or engineering majors. It is an in-depth extension of the CP Physics class with the introduction of some new topics including rotational motion, equilibrium and simple harmonic motion. The mathematical treatment of these topics will employ calculus that will be developed in parallel with work in that class. This class is strongly recommended for students interested in engineering, medicine, and mathematically related fields. This course will prepare students for the AP Physics Mechanics-C Exam. **Students are required to complete the AP exam at the end of the course**.

Math Prerequisites	Science Prerequisites	Offered to grades
Completion of or enrollment in AP calculus or instructor consent	CP Physics or consent of instructor	11-12