Science

Course Name	Credits	Grade Levels	Required Prerequisites
Biology	**1**	**9-11**	**None**
Biology Pre-AP	**1**	**9-10**	**See Suggested Guidelines**
AP Biology	**1**	**11-12**	**Biology & Chemistry See Suggested Guidelines**
Chemistry	**1**	**10-12**	**Required Prerequisites: *One unit of high school science & Algebra 1 Recommended Prerequisite: *Completion/Concurrent Enrollment in second year of math**
Chemistry Pre-AP	**1**	**10-12**	**Biology and Completion/Concurrent Enrollment in Algebra II See Suggested Guidelines**
AP Chemistry	**1**	**11-12**	**Chemistry(Recommended)& Algebra II See Suggested Guidelines**
Physics	**1**	**9-12**	**Algebra I**
Physics – UT OnRamps – Dual Credit	**1 HS credit 3 hours college credit**	**11-12**	***UT OnRamps Admissions Standards *Students will receive high school credit for: Physics *Students will receive college credit for: UT PHYS 1301**
AP Physics 1: Algebra-Based	**1**	**11-12**	**Algebra I, Geometry and completion or concurrent enrollment in Algebra II, Physics (Recom)or teacher recommendation.**
AP Physics 2: Algebra-Based	**1**	**11-12**	**Algebra I, Geometry, Algebra II, AP Physics 1: Algebra-Based Physics(Recom) See Suggested Guidelines**
AP Physics C: Electricity and Magnetism	**.5**	**11-12**	**Algebra I, Geometry, Algebra II, AP Physc 1 (Recom)Completion/Concurrent Enrollment in Calculus See Suggested Guidelines**
AP Physics C: Mechanics	**.5**	**11-12**	**Algebra I, Geometry, Algebra II Completion/Concurrent Enrollment in Calculus See Suggested Guidelines**
Principles of Technology I (CTE)	**1**	**10-12**	**Completion of one unit of Science and Algebra I**
Advanced Animal Science (CTE)	**1**	**12**	**Biology and Chemistry Algebra I and Geometry Small Animal Management or Livestock Production or Equine Science**
Advanced Plant and Soil Science (CTE)	**1**	**12**	**Biology Chemistry or Physics 1 credit in Agriculture, Food, & Natural Resources Career Cluster**
Anatomy and Physiology of Human Systems (CTE)	**1**	**10-12**	**Required Prerequisites: *Biology and one additional science credit Recommended Prerequisite: *A course from the Health Science Career Cluster**
Aquatic Science	**1**	**10-12**	**Required Prerequisite: *Biology Recommended Prerequisite: *Completion/Concurrent Enrollment in Chemistry**
Astronomy	**1**	**11-12**	**One unit of High School Science**
Engineering Science (CTE)	**1**	**10-12**	**Required Prerequisites: *Algebra I and Biology, Chemistry or Physics Recommended Prerequisites: *Geometry & Introduction to Engineering Design**
Environmental Systems	**1**	**11-12**	**One unit of high school life science and one unit of high school physical science**

AP Environmental Science	**1**	**11-12**	**Algebra I and Biology Chemistry or Physics See Suggested Guidelines**
Food Science (CTE)	**1**	**11-12**	**Biology, Chemistry and one additional unit of science**
Forensic Science (CTE)	**1**	**11-12**	**Required Prerequisites: *Biology and Chemistry Recommended Prerequisite: *One course in the Law, Public Safety, Corrections and Security Career Cluster**
Scientific Research and Design (CTE) Aerospace Endorsement STEM JHS	1	**10-12**	**Prerequisites: Biology, IPC, or Principles of Technology, Physics, Engineering Design and Presentation**
Engineering Design and Problem Solving (CTE) STEM Aerospace Endorsement JHS	1	**11-12**	**Prerequisites: Alg. I, Geometry, and Scientific Research and Design**

Suggested Guidelines for Science Pre-AP & AP Courses

- All students in advanced science courses should have strong personal commitment to accomplishing goals and objectives of the course.
- Students should have high academic interest and work ethic in science.
- Students encouraged to seek teacher advisement.

Biology Pre-AP

- Successful completion of previous year's Pre-AP science and Algebra I with an average of 85 or above.
- Successful completion of previous year's regular science and Algebra I with an average of 90 or above.
- Student should have passed STAAR Mathematics or STAAR Algebra 1 EOC in 8th grade and STAAR Science in 8th grade.

AP Biology

- Successful completion of Pre-AP Biology and Chemistry with an average of 85 or above.
- Successful completion of regular Biology and Chemistry with an average of 90 or above.
- Student **must have passed** STAAR Biology EOC

Chemistry Pre-AP

- Successful completion of Pre-AP Biology and Geometry with an average of 85 or above.
- Successful completion of regular Biology and Geometry with an average of 90 or above.
- Student should have passed STAAR Biology EOC and STAAR Algebra I EOC.

AP Chemistry

- Successful completion of Pre-AP Chemistry and Algebra II with an average of 85 or above.
- Successful completion of regular Chemistry and Algebra II with an average of 90 or above.
- Student **must have passed** STAAR Biology EOC and STAAR Algebra I EOC.

AP Physics 1: Algebra-Based
AP Physics 2: Algebra-Based

- Successful completion of Pre-AP Physics (Recommended) and Algebra II with an average of 85 or above.
- Successful completion of regular Physics (Recommended)and Algebra II with an average of 90 or above.
- Student **must have passed** STAAR Biology EOC and STAAR Algebra I EOC.

AP Physics C: Electricity and

Magnetism AP Physics C:

Mechanics

- Successful completion of Pre-AP Algebra II with an average of 85 or above.
- Successful completion of regular Physics and Algebra II with an average of 90 or above.
- Student **must have passed** STAAR Biology EOC and STAAR Algebra I EOC.

AP Environmental Science

- Successful completion of Pre-AP Biology and Chemistry or Physics with an average of 85 or above.
- Successful completion of regular Biology and Chemistry or Physics with an average of 90 or above.
- Student **must have passed** STAAR Biology EOC and STAAR Algebra I EOC.

The curriculum for AP courses is prescribed by the College Board. For AP course information, access http://apcentral.collegeboard.com/course

Biology
Course Number:
N100.MY **Grade**
Placement: 9-11
Prerequisite: None
Credit: 1
PEIMS#: 03010200
In Biology, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students in Biology study a variety of topics that include: structures and functions of cells and viruses; growth and development of organisms; cells, tissues, and organs; nucleic acids and genetics; biological evolution; taxonomy; metabolism and energy transfers in living organisms; living systems; homeostasis; and ecosystems and the environment. **Students will be required to take the STAAR Biology End-of-Course assessment for this course.**

Biology Pre-AP
Course Number: N100.PY
Grade Placement: 9-10
Prerequisite: See Suggested Guidelines
Credit: 1
PEIMS#: 03010200
Pre-AP students should expect to continue in the AP science program with a goal of taking the AP Biology test. Students will focus on skills required for the Advanced Placement Exam. Biology Pre-AP covers the same concepts as those in Biology

except presentation is accelerated and in more detail. Biology Pre-AP is an advanced course recommended for students with a strong interest in science and good study skills. Out of class time will be necessary for success in course work. **A Pre-AP Letter of Understanding must be submitted at the start of the school year in order for students to take this course. Students will be required to take the STAAR Biology End-of-Course assessment for this course.**

AP Biology 2
Course Number: N132.AY
Grade Placement: 11-12
Prerequisites: Biology, Chemistry and See Suggested Guidelines
Credit: 1
PEIMS#: A3010200
Students enrolled in this course are encouraged to take the Advanced Placement Exam in May for possible college credit. This course is designed to prepare students for the AP Biology Exam and is similar to a college level introductory Biology course. AP Biology is based on four Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about living organisms and biological systems.
The following are the four Big Ideas for this course:
• The process of evolution explains the diversity and unity of life.
• Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.
• Living systems store, retrieve, transmit, and respond to information essential to life processes.
• Biological systems interact, and these systems and their interactions possess complex properties.
Content requirements for Advanced Placement (AP) Biology are prescribed in the College Board Publication *Advanced Placement Course Description: Biology*, published by The College Board. Out of class time will be necessary for success in course work. **An AP Letter of Understanding must be submitted at the start of the school year in order for students to take this course.**

Chemistry
Course Number: N200.MY
Grade Placement: 10-12
Required Prerequisites: One unit of high school science & Algebra 1
Recommended Prerequisite: Completion/Concurrent Enrollment in second year of math
Credit: 1
PEIMS#: 03040000
In Chemistry, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include characteristics of matter, use of the Periodic Table, development of atomic theory and chemical bonding, chemical stoichiometry, gas laws, solution chemistry, thermochemistry, and nuclear chemistry. Students will investigate how chemistry is an integral part of our daily lives.

Chemistry Pre-AP
Course Number: N200.PY
Grade Placement: 10-12
Prerequisites: Biology, Completion/Concurrent Enrollment in Algebra II and See Suggested Guidelines
Credit: 1
PEIMS#: 03040000
Students should expect a challenging Pre-AP curriculum with the expectation of moving on to AP Chemistry and taking the AP test. Students will focus on skills required for the Advanced Placement Exam. Chemistry Pre-AP covers the same concepts as those in Chemistry except presentation is accelerated and in more detail. Chemistry Pre-AP is an advanced course recommended for students with a strong interest in science and good study skills. Out of class time will be necessary for success in course work. **A Pre-AP Letter of Understanding must be submitted at the start of the school year in order for students to take this course.**

AP Chemistry 2
Course Number: N232.AY
Grade Placement: 11-12
Prerequisites: Chemistry, Algebra II and See Suggested Guidelines
Credit: 1
PEIMS#: A3040000
Students enrolled in this course are encouraged to take the Advanced Placement Exam in May for possible college credit. The key concepts and related content that define the AP Chemistry course and exam are organized around underlying principles called the Big Ideas. They encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about the particulate nature of matter underlying the observations students make about the physical world.
The following are the six Big Ideas for this course:
• The chemical elements are the building blocks of matter, which can be understood in terms of the arrangements of atoms.
• Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.
• Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.
• Rates of chemical reactions are determined by details of the molecular collisions.
• The laws of thermodynamics describe the essential role of energy and explain and predict the direction of changes in matter.
• Bonds or attractions that can be formed can be broken. These two processes are in constant competition, sensitive to initial conditions and external forces or changes.
Content requirements for Advanced Placement (AP) Chemistry are prescribed in the College Board Publication *Advanced Placement Course Description: Chemistry*, published by The College Board. Out of class time will be necessary for success in course work**. An AP Letter of Understanding must be submitted at the start of the school year in order for students to take this course.**

Physics
Course Number: N300.MY
Grade Placement: 9-12
Prerequisite: Algebra I
Credit: 1
PEIMS#: 03050000
In Physics, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include: laws of motion; changes within physical systems and conservation of energy and momentum; forces; thermodynamics; characteristics and behavior of waves; and atomic, nuclear, and quantum physics. Students who successfully complete Physics will acquire factual knowledge within a conceptual framework, practice experimental design and interpretation, work collaboratively with colleagues, and develop critical thinking skills.

Physics – UT OnRamps – Dual Credit
Course Number: N300.RY
Grade Placement: 11-12
Prerequisites: Algebra I, Geometry, and Algebra II, & UT OnRamps Admissions Standards
Credit: 1 HS credit, 3 college credit hours
Mechanics, Heat, and Sound – General Physics Technical Course I. Mechanics, Heat, and Sound introduces big ideas in physics, such as Newtonian mechanics, which describes objects changing their state of motion because of forces causing them to accelerate. Taken together, the topics reinforce the general idea that the behavior of many objects in the world can be described precisely with simple mathematics. This is an algebra-focused (non-calculus) course in mechanics that fulfills a general physics requirement. Proficiency in algebra and geometry is assumed. Students will practice problem-solving and analyzing physical situations involving motion, force, energy, rotations, heat, oscillations, waves, and sound. They will explore concepts in small groups, develop ideas, and explain them. The course lays the groundwork for college majors including engineering, physics, chemistry, or mathematics. Students will experience high-quality curriculum designed by the faculty at UT Austin. Students can earn three hours of UT credit with feedback and assessment provided by UT course staff. **Students must complete admissions process for UT OnRamps. This is a college course offered on Hays CISD high school campuses. Students must purchase the books required by the instructor. Students will experience high quality curriculum designed by the faculty at The University of Texas at Austin. This course is taught by a Hays CISD trained UT OnRamps faculty member.** At the end of the year long course, students with a passing grade will receive three hours college credit for UT PHYS 1301. Students will receive high school credit for Physics. ****This course will only be offered if the minimum enrollment is met. ****

AP Physics 1: Algebra-Based
Course Number: N331.AY
Grade Placement: 11-12
Prerequisites: Algebra I, Geometry, Completion/Concurrent enrollment in Algebra II, Physics (Recommended) and See Suggested Guidelines NOTE: Although this course includes the basic use of Trigonometric functions, this understanding can be gained either in the concurrent math course (Algebra II) or in the AP Physics 1 course itself.
Credit: 1
PEIMS#: A3050003
Students enrolled in this course are encouraged to take the Advanced Placement Exam in May for possible college credit. AP Physics 1: Algebra-Based is the equivalent to a first-semester college course in algebra-based physics. This college level course is designed for students who do not wish to major in math, physics, or engineering. This course is ideal for students who plan to study biology, medicine, or the liberal arts. The course will include a hands-on laboratory component comparable to introductory college-level physics. Students explore principles of Newtonian mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits. The course is based on six Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about the physical world.
The following are the six Big Ideas for this course:
• 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.
This college level course is designed for students who do not wish to major in math, physics, or engineering. This course is ideal for students who plan to study biology, medicine, or the liberal arts. The course will include a hands-on laboratory component comparable to introductory college-level physics. Content requirements for Advanced Placement (AP) Physics are prescribed in the College Board Publication: *AP Physics 1: Algebra-Based, Course Description* published by The College Board. Out of class time will be necessary for success in course work. This course is the first part of a two year sequence. Year two students take AP Physics 2: Algebra-Based. **An AP Letter of Understanding must be submitted at the start of the school year in order for students to take this course.**

AP Physics 2: Algebra-Based
Course Number: N332.AY
Grade Placement: 12
Prerequisites: Algebra I, Geometry, Algebra II, Physics (Recommended), AP Physics 1: Algebra-Based and See Suggested Guidelines **Credit:** 1
PEIMS#: A3050004
Students enrolled in this course are encouraged to take the Advanced Placement Exam in May for possible college credit. AP Physics 2: Algebra-Based is the equivalent to a second-semester college course in algebra-based physics. This college level course is designed for students who do not wish to major in math, physics, or engineering. This course is ideal for students who plan to study biology, medicine, or the liberal arts. The course will include a hands-on laboratory component

comparable to introductory college-level physics. AP Physics 2 is an algebra-based, introductory college-level physics course that explores topics such as fluid statics and dynamics; thermodynamics with kinetic theory; PV diagrams and probability; electrostatics; electrical circuits with capacitors; magnetic fields; electromagnetism; physical and geometric optics; and quantum, atomic, and nuclear physics. Through inquiry-based learning, students will develop scientific critical thinking and reasoning skills. Students explore principles of fluids, thermodynamics, electricity, magnetism, optics, and topics in modern physics. The course is based on seven Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about the physical world.
The following are the seven Big Ideas for this course:
• 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.
• The mathematics of probability can be used to describe the behavior of complex systems and to interpret the behavior of quantum mechanical systems.
Content requirements for Advanced Placement (AP) Physics are prescribed in the College Board Publication: *AP Physics 2: Algebra-Based, Course Description* published by The College Board. Out of class time will be necessary for success in course work. This course is the second part of a two year sequence. **An AP Letter of Understanding must be submitted at the start of the school year in order for students to take this course.**

AP Physics 2 C: Electricity & Magnetism
Course Number: N333.AY
Grade Placement: 11-12
Prerequisites: Physics (Recommended), Algebra I, Geometry, Algebra II, Completion/Concurrent Enrollment in Calculus and See Suggested Guidelines
Credit: 1
PEIMS#: A3050005
Students enrolled in this course are encouraged to take the Advanced Placement Exam in May for possible college credit. AP Physics C: Electricity and Magnetism, is equivalent to a semester-long, introductory calculus-based college course and covers electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. Introductory differential and integral calculus is used throughout the course. The AP Physics C: Electricity and Magnetism course applies both differential and integral calculus, and builds upon the AP Physics C: Mechanics course by providing instruction in each of the following five content areas:
• Electrostatics
• Conductors, capacitors, and dielectrics
• Electric circuits
• Magnetic fields
• Electromagnetism
Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices and experimental skills enables teachers to use the principles of scientific inquiry to promote a more engaging and rigorous experience for AP Physics C: Electricity and Magnetism students. Such practices or skills require students to
• Design experiments
• Observe and measure real phenomena
• Organize, display and critically analyze data
• Analyze sources of error and determine uncertainties in measurement
• Draw inferences from observations and data
• Communicate results, including suggested ways to improve experiments and proposed questions for further study.
A minimum of 20 percent of instructional time is devoted to hands on and inquiry-based laboratory investigations. Content Requirements. Content requirements for Advanced Placement (AP) Physics C: Electricity and Magnetism are prescribed in the College Board Publication *Advanced Placement Course Description: Physics C: Electricity and Magnetism*, published by The College Board. Out of class time will be necessary for success in course work. **An AP Letter of Understanding must be submitted at the start of the school year in order for students to take this course.**

AP Physics 2 C: Mechanics
Course Number: N334.AY
Grade Placement: 11-12
Prerequisites: Physics, AP Physics 1, Algebra I, Geometry, Algebra II, Completion/Concurrent Enrollment in Calculus and See Suggested Guidelines
Credit: 1
PEIMS#: A3050006
Students enrolled in this course are encouraged to take the Advanced Placement Exam in May for possible college credit. AP Physics C: Mechanics is equivalent to a semester-long, introductory calculus-based college course. It covers kinematics; Newton's laws of motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. Introductory differential and integral calculus is used throughout the course. The AP Physics C: Mechanics course applies both differential and integral calculus and provides instruction in each of the following six content areas:
• Kinematics
• Newton's laws of motion
• Work, energy and power
• Systems of particles and linear momentum
• Circular motion and rotation
• Oscillations and gravitation
Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices and experimental skills enables teachers to use the principles of scientific inquiry to promote a more engaging and rigorous experience for AP Physics C: Mechanics students. Such practices or skills require students to
• Design experiments
• Observe and measure real phenomena
• Organize, display, and critically analyze data
• Analyze sources of error and determine uncertainties in measurement

• Draw inferences from observations and data
• Communicate results, including suggested ways to improve experiments and proposed questions for further study.
A minimum of 20 percent of instructional time is devoted to hands on and inquiry-based laboratory investigations.
Content Requirements. Content requirements for Advanced Placement (AP) Physics C: Mechanics are prescribed in the College Board Publication *Advanced Placement Course Description: Physics C: Mechanics*, published by The College Board. Out of class time will be necessary for success in course work. **An AP Letter of Understanding must be submitted at the start of the school year in order for students to take this course.**

Principles of Technology I (CTE)
Course Number: C021.1Y
Grade Placement: 10-12
Prerequisites: Completion of one unit of Science and Algebra I
Credit: 1
PEIMS#: 13037100
In Principles of Technology, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Various systems will be described in terms of space, time, energy, and matter. Students will study a variety of topics that include laws of motion, conservation of energy, momentum, electricity, magnetism, thermodynamics, and characteristics and behavior of waves. Students will apply physics concepts and perform laboratory experimentations for at least 40% of instructional time using safe practices. This course is also listed in the Career & Technology section of this course guide.

Advanced Animal Science (CTE)
Course Number: CA05.1Y
Grade Placement: 11-12
Prerequisites: Biology and Chemistry; Algebra I and Geometry; and either Small Animal Management, Equine Science, or Livestock Production
Credit: 1 science credit
PEIMS#: 13000700
Advanced Animal Science examines the interrelatedness of human, scientific, and technological dimensions of livestock production. Instruction is designed to allow for the application of scientific and technological aspects of animal science through field and laboratory experiences. To prepare for careers in the field of animal science, students must attain academic skills and knowledge, acquire knowledge and skills related to animal systems, and develop knowledge and skills regarding career opportunities, entry requirements, and industry standards. To prepare for success, students need opportunities to learn, reinforce, apply, and transfer their knowledge and skills in a variety of settings. This course will include at least 40% laboratory investigation and fieldwork using appropriate scientific inquiry. This course is also listed in the Career & Technology section of this course guide. **This course will count as a science credit.**

Scientific Research and Design Course Number (CTE)
Course Number: CO10.1Y
Grade Placement: 11 – 12
Required Prerequisites: Biology, Integrated Physics and Chemistry (IPC), or Physics
Credit: 1 Location: JHS
PEIMS#: 13037200
Scientific Research and Design is a broad-based course designed to allow districts and schools considerable flexibility to develop local curriculum to supplement any program of study or coherent sequence. The course has the components of any rigorous scientific or engineering program of study from the problem identification, investigation design, data collection, data analysis, formulation, and presentation of the conclusions. All of these components are integrated with the career and technical education emphasis of helping students gain entry-level employment in high-skill, high-wage jobs and/or continue their education. Students must meet the 40% laboratory and fieldwork requirement. This course satisfies a high school science graduation requirement. **Students shall be awarded one science credit for successful completion of this course**. Students can take this course with a Practicum Course. Students may take this course with different course content for a maximum of three credits.

Engineering Design and Problem Solving

Course Number: CO27.1Y

Grade Placement: 11 – 12

Required Prerequisites: Algebra I, Geometry, and Engineering Design and Presentation I

Credit: 1

Science Credit Location: JHS

PEIMS#: 13037300

The Engineering Design and Problem-Solving course is the creative process of solving problems by identifying needs and then devising solutions. The solution may be a product, technique, structure, or process depending on the problem. Science aims to understand the natural world, while engineering seeks to shape this world to meet human needs and wants. Engineering design takes into consideration limiting factors or "design under constraint." Various engineering disciplines address a broad spectrum of design problems using specific concepts from the sciences and mathematics to derive a solution. The design process and problem solving are inherent to all engineering disciplines. **This course satisfies a high school science graduation requirement.** Students shall be awarded one credit for successful completion of this course.

Advanced Plant and Soil Science
(CTE) Course Number: CA10.1Y
Grade Placement: 11-12
Prerequisites: Biology; Chemistry or Physics; one additional credit in the Agriculture, Food, & Natural Resources Career Cluster
Credit: 1 science credit
Location: HHS, LHS
PEIMS#: 13002100
Advanced Plant and Soil Science provides a way of learning about the natural world. Students should know how plant and soil science has influenced a vast body of knowledge, that there are still applications to be discovered, and that plant and soil science is the basis for many other fields of science. To prepare for careers in plant and soil science, students must attain academic skills and knowledge, acquire technical knowledge and skills related to plant and soil science and the workplace, and develop knowledge and skills regarding career opportunities, entry requirements, and industry expectations. To prepare for success, students need opportunities to learn, reinforce, apply, and transfer their knowledge and skills and technologies in a variety of settings. This course will include at least 40% laboratory investigation and fieldwork using appropriate scientific inquiry. This course is also listed in the Career & Technology section of this course guide. **This course will count as a science credit.**

Anatomy and Physiology of Human Systems (CTE)
Course Number: CH08.1Y
Grade Placement: 10-12
Required Prerequisites: Biology and one additional science credit
Recommended Prerequisite: a course from the Health Science Career Cluster
Credit: 1 science credit
PEIMS#: 13020600
This course provides a comprehensive study of the anatomy and physiology of the human body. Topics include body organization; homeostasis; cytology; histology; and the integumentary, skeletal, muscular, nervous systems and special senses. Topics will be presented through an integration of biology, chemistry, and physics. Students will study the structures and functions of the human body and body systems and will investigate the body's responses to forces, maintenance of homeostasis, electrical interactions, transport systems, and energy systems. This course will include at least 40% laboratory investigation and fieldwork using appropriate scientific inquiry. This course is also listed in the Career & Technology section of this course guide. **This course is not a substitute for Health for graduation. This course will count as a science credit.**

Aquatic Science
Course Number: N800.MY
Grade Placement: 10-12
Required Prerequisite:
Biology
Recommended Prerequisite:
Completion/Concurrent Enrollment in Chemistry
Credit: 1
PEIMS#: 03030000
In Aquatic Science, students study the interactions of biotic and abiotic components in aquatic environments, including impacts

on aquatic systems. Investigations and field work in this course may emphasize fresh water or marine aspects of aquatic science depending primarily upon the natural resources available for study near the school. Students who successfully complete Aquatic Science will acquire knowledge about a variety of aquatic systems, conduct investigations and observations of aquatic environments, work collaboratively with peers, and develop critical-thinking and problem-solving skills.

Astronomy
Course Number: N810.MY
Grade Placement: 11-12
Prerequisite: One unit of High School Science
Credit: 1
PEIMS#: 03060100
In Astronomy, students conduct laboratory and field investigations, use scientific methods, and make informed decisions using critical thinking and scientific problem solving. Students study the following topics: astronomy in civilization, patterns and objects in the sky, our place in space, the moon, reasons for the seasons, planets, the sun, stars, galaxies, cosmology, and space exploration. Students who successfully complete Astronomy will acquire knowledge within a conceptual framework, conduct observations of the sky, work collaboratively, and develop critical-thinking skills.

Engineering Science (CTE)
Course Number: CO15.1Y
Grade Placement: 10-12
Required Prerequisites: Algebra I and Biology; Chemistry or Physics
Recommended Prerequisites: Geometry and Introduction to Engineering Design
Credit: 1 science credit
PEIMS#: 13037300
Engineering Science is an engineering course designed to expose students to some of the major concepts and technologies that they will encounter in a postsecondary program of study in any engineering domain. Students will have an opportunity to investigate engineering and high-tech careers. In Engineering Science, students will employ science, technology, engineering, and mathematical concepts in the solution of real-world challenge situations. Students will develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges. Students will also learn how to document their work and communicate their solutions to their peers and members of the professional community. This course is also listed in the Career & Technology section of this course guide. ***This course counts as a science credit.***

Environmental Systems
Course Number: N500.MY
Grade Placement: 11-12
Prerequisites: Completion of one unit of high school life science and completion of one unit of high school physical science
Credit: 1
PEIMS#: 03020000
In Environmental Systems, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include: biotic and abiotic factors in habitats, ecosystems and biomes, interrelationships among resources and an environmental system, sources and flow of energy through an environmental system, relationship between carrying capacity and changes in populations and ecosystems, and changes in environments.

AP Environmental Science
Course Number: N530.AY
Grade Placement: 11-12
Prerequisites: Algebra I; Biology; Chemistry or Physics and See Suggested Guidelines
Credit: 1
PEIMS#: A3020000
Students enrolled in this course are encouraged to take the Advanced Placement Exam in May for possible college credit.
The AP Environmental Science course is designed to be the equivalent of a one-semester introductory college course in environmental science. Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. There are several unifying themes that cut across topics.
The following are the six course themes for this course:
- Science is a process.
- Energy conversions underlie all ecological processes.
- The Earth itself is one interconnected system.
- Humans alter natural systems.
- Environmental problems have a cultural and social context.
- Human survival depends on developing practices that will achieve sustainable systems.

There will be a heavy emphasis on laboratory investigation as well as conceptual problem solving. Content requirements for Advanced Placement (AP) Environmental Science are prescribed in the College Board Publication *Advanced Placement Course Description: Environmental Science*, published by The College Board. Out of class time will be necessary for success in course work. **An AP Letter of Understanding must be submitted at the start of the school year in order for students to take this course.**

Food Science (CTE)
Course Number: CI07.1Y
Grade Placement: 11-12
Prerequisites: Biology, Chemistry and one additional unit of science
Credit: 1 science credit
PEIMS#: 1302300
In Food Science [Chemistry] students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Food Science is the study of the nature of foods, the causes of deterioration, the principles underlying food processing, and the improvement of foods for the consuming public. This course is also listed in the Career & Technology section of this course guide. ***This course counts as a science credit.***

Forensic Science (CTE)
Course Number: CL03.1Y
Grade Placement: 11-12
Required Prerequisites: Biology and Chemistry
Recommended Prerequisite: One course in the Law, Public Safety, Corrections, and Security Career Cluster
Credit: 1 science credit
PEIMS#: 13029500
Forensic Science is a course that introduces students to the application of science to connect a violation of law to a specific criminal, criminal act, or behavior and victim. Students will learn terminology and procedures related to the search and examination of physical evidence in criminal cases as they are performed in a typical crime laboratory. Using scientific methods, students will collect and analyze evidence such as fingerprints, bodily fluids, hairs, fibers, paint, glass, and cartridge cases. Students will also learn the history and the legal aspects as they relate to each discipline of forensic science. This course will include at least 40% laboratory investigation and fieldwork using appropriate scientific inquiry. This course is also listed in the Career & Technology section of this course guide. **This course will count as a science credit.**