

39021 Applied Environmental Awareness IV (B)

1 credit

Gr: 9-12



Prerequisite: Eligible for A. L. E. program/placement by the ARD Committee.

Description: [Applied Learning Environment (A. L. E.) Course] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for Biology and determined by the ARD Committee to be a suitable substitute for Biology.

39076 Basic Biology (B)

1 credit

Gr: 9-12



Prerequisite: Middle School Science required by ARD as denoted on Schedule Page.

Description: [Base/ABC/PAC] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for Biology and determined by the ARD Committee to be a suitable substitute for Biology.

33115 Biology for English Learners (R)

1 credit

Gr: 9-12



Prerequisite: English learner

Description: [ENGLISH LEARNER (EL) COURSE] This course is based on the TEKS for Biology as accommodated for students receiving services as English learners at the beginning, intermediate, and advanced levels of language proficiency. Accommodations occur for English learners in time, pacing, methodology, and/or method of assessment.

33112 Biology I (R)

1 credit

Gr: 9-12

Prerequisite: None

Description: Biology provides instruction that allows students to conduct field and laboratory 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; ecosystems; and plants and the environment.

33113 Pre AP Biology I (H)

1 credit

Gr: 9-12



Prerequisite: None

Description: This course is designed to prepare students for AP Biology and provides instruction that allows students to conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem-solving. Students are also provided the opportunity to use technology as a tool and resource for learning biology. 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; ecosystems; and plants and the environment. In addition advanced critical-thinking and problem-solving skills will be developed with a group or individual project presented in a competitive public forum. *Pre AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33116 MST Biology I (H)

1 credit

Gr: 9-12



Prerequisite: None

Description: [Math-Science-Technology magnet course offered only at NGHS] This course is designed to prepare students for AP Biology and covers the fundamental principles applicable to all living organisms. The study includes a consideration of the molecular basis of life, cell structure and function, basic metabolic processes, microorganisms, and a brief survey of the plant kingdom. Advanced probe ware and software simulations are utilized to master biological concepts. Individual student projects and teamwork will be an integral part of the course. *Pre AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

39022 Applied Environmental Awareness V (B)

1 credit

Gr: 9-12



Prerequisite: Eligible for A. L. E. program/placement by the ARD Committee.

NOTE: All courses may not be offered on every campus.

Description: [Applied Learning Environment (A. L. E.) Course] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for Integrated Physics and Chemistry and determined by the ARD Committee to be a suitable substitute for Integrated Physics and Chemistry.

39093 Basic Integrated Physics & Chemistry (B) **1 credit** **Gr: 9-12**



Prerequisite: Biology required by ARD as denoted on Schedule Page.

Description: [Base/ABC/PAC] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for Integrated Physics and Chemistry and determined by the ARD Committee to be a suitable substitute for Integrated Physics and Chemistry.

33019 Integrated Physics and Chemistry for English Learners (R) **1 credit** **Gr: 9-12**



Prerequisite: English learner, Biology (may be concurrent)

Description: [ENGLISH LEARNER (EL) COURSE] This course is based on the TEKS for Integrated Physics and Chemistry as accommodated for students receiving services as English learners at the beginning, intermediate, and advanced levels of language proficiency. Accommodations occur for English learners in time, pacing, methodology, and/or method of assessment.

33016 Integrated Physics and Chemistry (R) **1 credit** **Gr: 9-12**

Prerequisite: Biology (may be concurrent)

Description: This course integrates the disciplines of physics and chemistry in the following topics: motion, waves, energy transformations, properties of matter, changes in matter, and solution chemistry. Integrated Physics and Chemistry provides students with field and laboratory investigations which are used to learn about the natural world. Through the investigations students will use scientific methods and scientific inquiry to make informed decisions using critical-thinking and scientific problem-solving.

39100 Basic Chemistry (B) **1 credit** **Gr: 9-12**



Prerequisite: Biology required by ARD as denoted on Schedule Page.

Description: [Base/ABC/PAC] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for Chemistry and determined by the ARD Committee to be a suitable substitute for Chemistry.

33217 Chemistry for English Learners (R) **1 credit** **Gr: 10-12**



Prerequisite: English learner, Biology and Algebra I

Description: [ENGLISH LEARNER (EL) COURSE] This course is based on the TEKS for Chemistry as accommodated for students receiving services as English learners at the beginning, intermediate, and advanced levels of language proficiency. Accommodations occur for English learners in time, pacing, methodology, and/or method of assessment.

33212 Chemistry I (R) **1 credit** **Gr: 10-12**

Prerequisite: Biology and Algebra I

Description: Chemistry provides instruction that allows students to conduct field and laboratory 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; energy transformations during physical and chemical changes; atomic structure; periodic table of elements; behavior of gases; bonding; nuclear fusion and nuclear fission; oxidation-reduction reactions; chemical equations; solutes; properties of solutions; acids and bases; and chemical reactions. Students will investigate how chemistry is an integral part of our daily lives.

33213 Pre AP Chemistry I (H) **1 credit** **Gr: 10-12**



Prerequisite: Biology and Algebra I

Description: This course is designed to prepare students for AP Chemistry, and provides instruction that allows students to conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking

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and scientific problem solving. Students are also provided the opportunity to use technology as a tool and resource for learning Chemistry. Students study a variety of topics that include: characteristics of matter; energy transformations during physical and chemical changes; atomic structure; periodic table of elements; behavior of gases; bonding; nuclear fusion and nuclear fission; oxidation-reduction reactions; chemical equations; solutes; properties of solutions; acids and bases; and chemical reactions. Students will investigate how chemistry is an integral part of our daily lives. In addition advanced critical-thinking and problem-solving skills will be developed with a group or individual project presented in a competitive public forum. *Pre AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33216 MST Chemistry I (H)**1 credit****Gr: 10-12****Prerequisite:** Biology and Algebra I

Description: [Math-Science-Technology magnet course offered only at NGHS] This course is designed to prepare students for AP Chemistry, and provides an understanding of current atomic theory, molecular forces, hydration of ions, ionization of covalent compounds, acids, bases and salts, chemical equivalents, electrode potentials, molar solutions, and chemical equilibrium. The course utilizes various types of probe ware and software to display, collect, and analyze data. Gas chromatographs and spectrophotometers, both optical and atomic, will be employed. Integrated student projects will be an integral part of the course. *Pre AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

39023 Applied Environmental Awareness VI (B)**1 credit****Gr: 9-12****Prerequisite:** Eligible for A. L. E. program/placement by the ARD Committee.

Description: [Applied Learning Environment (A. L. E.) Course] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for science and determined by the ARD Committee to be a suitable substitute for science.

33311 Physics (R)**1 credit****Gr: 10-12****Prerequisite:** Algebra I

Description: Physics provides instruction that allows students to conduct field and laboratory 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; force; thermodynamics; characteristics and behavior of waves; and quantum physics. This course provides students with a conceptual framework, factual knowledge, and analytical and scientific skills.

33313 Pre AP Physics I (H)**1 credit****Gr: 10-12****Prerequisite:** Biology and Algebra I

Description: This course is designed to prepare students for AP Physics. In this course students will explore topics that will serve as a foundation for future studies in science and engineering. Pre-AP Physics is a comprehensive introductory physics course covering the major topics of classical physics including mechanics, thermodynamics, waves, optics, electromagnetism, and atomic theory. This course will also help all students develop the quantitative and reasoning skills that will prepare them for college and future careers. *PreAP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33319 Concepts in Physics (DC)**1 credit****Gr: 11-12****Prerequisite:** Chemistry, Algebra I, and satisfy Dual Credit enrollment criteria

Description: This course is offered at LCHS and NGHS only. Concepts in Physics (DC) is designed to introduce principles of physics for non-science majors. Emphasis is on classical mechanics, atomic nature of matter, thermodynamics, characteristics and behavior of waves, and forces in nature. The history of scientific developments and their impact on daily life are discussed. The principle of energy conservation is stressed, and current problems of worldwide energy production are examined. This course will provide credit for the high school physics requirement as well as dual credit through DCCCD. Students must meet the dual credit enrollment criteria in science. *Dual Credit courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

NOTE: All courses may not be offered on every campus.

33320 AP Physics I**1 credit****Gr: 9-12****Prerequisite:** Algebra I, Geometry, Algebra II (may be concurrent)

Description: AP Physics 1 provides instruction that allows students to conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students are also provided the opportunity to use technology as a tool and resource for learning Physics. This physics course is the equivalent to a first-semester college course in algebra-based physics. The course covers Newtonian mechanics (including rotational dynamics and angular momentum); work, energy, and power; and mechanical waves and sound. It will also introduce electric circuits. Students taking this course will be prepared for the Advanced Placement Physics 1 exam. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33321 AP Physics II**1 credit****Gr: 10-12****Prerequisite:** Chemistry, AP Physics 1, Algebra I, Geometry, Algebra II

Description: Physics 2 AP is the equivalent to a second-semester college course in algebra-based physics. The course covers fluid mechanics; thermodynamics; electricity and magnetism; optics; and atomic and nuclear physics. Physics 2 is a laboratory-oriented course with laboratory investigations conducted in mechanics, optics, heat, electricity, magnetism, radiation, atomic structure, and nuclear phenomena. Students acquire information using the senses and instrumentation. Students taking this course will be prepared for the Advanced Placement Physics 2 exam. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33318 AP Physics C: Mechanics**1 credit****Gr: 11-12****Prerequisite:** AP Physics 1 and Calculus (may be concurrent)

Description: This is a full year, single blocked course. This course provides a systematic introduction to the main principles of Mechanics, which form a foundation for study of other sciences, engineering and technology. This calculus-based course emphasizes knowledge of the basic laws of nature, the ability to apply that knowledge to the particular phenomenon, and the ability to achieve its complete experimental and theoretical explanation. Modern technology is used to increase the level of study, which includes a use of computers, probe ware, and a multimedia approach to reports and projects. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33322 AP Physics C: Electricity and Magnetism**1 credit****Gr: 11-12****Prerequisite:** AP Physics 1 and Calculus (may be concurrent)

Description: This course of study builds on the conceptual understanding attained in a first course of physics. This is a one semester, double blocked course. This course provides a systematic introduction to the main principles of Electricity and Magnetism, which form a foundation for study of other sciences, engineering and technology. This calculus-based course emphasizes knowledge of the basic laws of nature, the ability to apply that knowledge to the particular phenomenon, and the ability to achieve its complete experimental and theoretical explanation. Modern technology is used to increase the level of study, which includes a use of computers, probe ware, and a multimedia approach to reports and projects. Students may take this course in the spring, after completing AP Physics C: Mechanics in the fall. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33323 AP Physics C: Mechanics**1 credit****Gr: 11-12****Prerequisite:** AP Physics 1 and Calculus (may be concurrent)

Description: This course of study builds on the conceptual understanding attained in a first course of physics. This is a one semester, double blocked course. This course provides a systematic introduction to the main principles of Mechanics, which form a foundation for study of other sciences, engineering and technology. This calculus-based course emphasizes knowledge of the basic laws of nature, the ability to apply that knowledge to the particular phenomenon, and the ability to achieve its complete experimental and theoretical explanation. Modern technology is used to increase the level of study, which includes a use of computers, probe ware, and a multimedia approach to reports and projects. Students may take this course in the fall, followed by AP Physics C: Electricity &

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Magnetism in the spring. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33324 AP Physics C: Electricity and Magnetism**1 credit****Gr: 11-12**

Prerequisite: AP Physics 1 and Calculus (may be concurrent)

Description: This course of study builds on the conceptual understanding attained in a first course of physics. This is a full year, single blocked course. This course provides a systematic introduction to the main principles of Electricity and Magnetism, which form a foundation for study of other sciences, engineering and technology. This calculus-based course emphasizes knowledge of the basic laws of nature, the ability to apply that knowledge to the particular phenomenon, and the ability to achieve its complete experimental and theoretical explanation. Modern technology is used to increase the level of study, which includes a use of computers, probe ware, and a multimedia approach to reports and projects. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

39024 Applied Environmental Awareness VII (B)**1 credit****Gr: 9-12**

Prerequisite: Eligible for A. L. E. program/placement by the ARD Committee.

Description: [Applied Learning Environment (A. L. E.) Course] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for science and determined by the ARD Committee to be a suitable substitute for science.

39025 Applied Environmental Awareness VIII (B)**1 credit****Gr: 9-12**

Prerequisite: Eligible for A. L. E. program/placement by the ARD Committee.

Description: [Applied Learning Environment (A. L. E.) Course] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for science and determined by the ARD Committee to be a suitable substitute for science.

39074 Basic Astronomy (B)**1 credit****Gr: 9-12**

Prerequisite: Physics required by ARD as denoted on Schedule Page.

Description: [Base/ABC/PAC] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for Astronomy and determined by the ARD Committee to be a suitable substitute for Astronomy.

39077 Basic Environmental Systems (B)**1 credit****Gr: 9-12**

Prerequisite: Physics required by ARD as denoted on Schedule Page.

Description: [Base/ABC/PAC] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for Environmental Systems and determined by the ARD Committee to be a suitable substitute for Environmental Systems.

39105 Basic Physics (B)**1 credit****Gr: 9-12**

Prerequisite: Chemistry required by ARD as denoted on Schedule Page.

Description: [Base/ABC/PAC] This is a locally designed course aligned with the Texas Essential Knowledge and Skills for Physics and determined by the ARD Committee to be a suitable substitute for Physics.

8A410 Advanced Animal Science (R)**1 credit****Gr: 11-12**

Prerequisite: Prior completion of one AFNR course, or teacher recommendation; Biology and IPC are recommended.

Description: [Career and Technical Education course offering science credit only at GHS and SGHS] This course 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. This course may meet the requirements for the fourth science credit.

NOTE: All courses may not be offered on every campus.

8A418 Advanced Plant & Soil Science (R)**1 credit****Gr: 11-12**

Prerequisite: Prior completion of one AFNR course, or teacher recommendation; Biology and IPC are recommended.

Description: [Career and Technical Education course offering science credit only at NFHS] 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. Investigations, laboratory practices, and field exercises will be used to develop an understanding of current plant and soil science. This course is designed to prepare students for careers in the food and fiber industry. Students will learn, reinforce, apply, and transfer their knowledge in a variety of settings. This course may meet the requirements for the fourth science credit.

83420 Anatomy & Physiology of Human Systems (R)**1 credit****Gr: 10-12**

Prerequisite: Biology, (IPC, Chemistry or Physics, 2 Credits of Science)

Description: Anatomy and Physiology of Human Systems is a laboratory-oriented course in which students investigate the structures and functions of the components of the human body. The course presents investigation of the specialization of cells, how cells function cooperatively as tissue and organs, and the interrelationships of systems that result in a living organism. The course offers students opportunities to investigate anatomical structures and regulating mechanisms that influence how systems function. These concepts may be reinforced through application in a medical facility. The course is designed to build a knowledge base for those students who wish to pursue a medically related career.

83421 Anatomy & Physiology of Human Systems (H)**1 credit****Gr: 10-12**

Prerequisite: Biology, (IPC, Chemistry or Physics, 2 Credits of Science)

Description: This honors level course is intended for the student interested in a medical career. In this course students will participate in in-depth investigations of the structures and functions of the components of the human body. Advanced critical thinking skills will be developed with an emphasis on group and individual projects and science competitions. Concepts will be reinforced through application at a medical facility when appropriate.

33429 Aquatic Science (R)**1 credit****Gr: 10-12**

Prerequisite: Biology, IPC, Recommended Chemistry (may be concurrent)

Description: Students will conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and problem solving. Students study a variety of topics that include: components of an aquatic ecosystem, relationships among aquatic habitats and ecosystems, roles of cycles within an aquatic environment, adaptations of aquatic organisms, changes with aquatic environments, geological phenomena and fluid dynamics effects, and origin and use of water in a watershed. Students will describe the aquatic environment using physical, mathematical and conceptual models. Students will collect and analyze global environmental data and baseline quantitative data from an aquatic environment using technology. Students will evaluate trends in data to determine the factors that impact an aquatic ecosystem and analyze the impact of human influences including fishing, transportation, and recreation.

33414 Astronomy (R)**1 credit****Gr: 11-12**

Prerequisite: Biology, (IPC, Chemistry or Physics, (2 Credits of Science)

Description: Astronomy provides instruction that allows students to conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study the following topics: information about the universe; scientific theories of the evolution of the universe; characteristics and the life cycle of stars; exploration of the universe; role of the Sun in our solar system; planets; and the orientation and placement of the Earth.

33123 AP Biology**1 credit****Gr: 11-12**

Prerequisite: Biology

Description: A major goal of the course is to involve students in the activities and endeavors of science. They formulate hypotheses, design and conduct experiments, and interpret data. The course focuses on the process of scientific investigation. Students gain skills in investigation and apply those skills to in-depth studies of a few selected areas of biology. Considerable emphasis is placed on the role of science in society, the complex and extremely important interactions between science and the problems and decisions that

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citizens must make. This is a college-level course, and students taking this course will be prepared for the Advanced Placement test in this area. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33121 AP Biology DC – Collegiate academy and early-college programs only 1 credit

Gr: 10-12



Prerequisite: Biology

Description: This course is for science majors. A major goal of the course is to involve students in the activities and endeavors of science. They formulate hypotheses, design and conduct experiments, and interpret data. The course focuses on the process of scientific investigation. Students gain skills in investigation and apply those skills to in-depth studies of a few selected areas of biology. Considerable emphasis is placed on the role of science in society, the complex and extremely important interactions between science and the problems and decisions that citizens must make. This is a college-level course, and students taking this course will be prepared for the Advanced Placement test in this area while meeting the requirements of dual credit course. *AP and DC courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33223 AP Chemistry

1 credit

Gr: 10-12



Prerequisite: Biology, Chemistry and Algebra II

Description: Students study descriptive chemistry of the elements in greater detail than in Chemistry (H/Pre AP). Other topics include crystallography, metallurgy, and chemical bonding. In addition to the laboratory activities supporting these topics, there is some experience with instrumental methods of chemical analysis. Understanding principles of reaction is enhanced through laboratory investigations in thermodynamics, chemical kinetics, and equilibrium. The course concludes with a study of selected topics in organic chemistry, biochemistry, and nuclear chemistry. This is a college-level course, and students taking this course will be prepared for the Advanced Placement test in this area. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

83225 Chemistry II for Non-Science Majors (DC)

1 credit

Gr: 11-12



Prerequisite: Chemistry, Physics, Algebra II, and satisfy Dual Credit enrollment criteria

Description: [Collegiate Academy Dual Credit course offered only at LCHS] This course is for non-science majors. The first semester of this course involves fundamental concepts presented in lecture and laboratory including the periodic table, atomic structure, chemical bonding, reactions, stoichiometry, states of matter, properties of metals, nonmetals and compounds, chemical nomenclature, acid-base theory, oxidation-reduction and solutions. Descriptive chemistry is emphasized. In the second semester, organic chemistry and biochemistry are surveyed. The reactions, syntheses, nomenclature, uses, purposes and properties of the important classes of organic and biochemical compounds are studied. *Dual Credit courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

33402 Earth & Space Science (R)

1 credit

Gr: 11-12

Prerequisite: Biology, Chemistry, Physics (3 Credits of Science)

Description: Earth and Space Science (ESS) is a 12th grade capstone science course that focuses on three major science concepts: the Earth in Space and Time, Solid Earth, and Fluid Earth. Topics covered in this course include geology, oceanography, meteorology, cosmology, and astronomy, and within the significant secondary sciences of tectonics, geochemistry, geophysics, stratigraphy, geochronology, paleontology, planetary geology, marine geology, climatology, and physical oceanography

33417 Environmental Systems (R)

1 credit

Gr: 11-12

Prerequisite: Biology and either Chemistry, Physics or IPC.

Description: In this course, students will conduct field and laboratory 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.

NOTE: All courses may not be offered on every campus.

33426 AP Environmental Science**1 credit****Gr: 11-12****Prerequisite:** Biology, Chemistry and Algebra I

Description: This course would provide an advanced level of studies in the relationships of organisms to their habitats. People's use of the planetary resources and cost/benefit ratios will be presented. This course is laboratory/field oriented with special emphasis on those topics delineated in the Advanced Placement Course Description. This is a college-level course, and students taking this course will be prepared for the Advanced Placement test in this area. *AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

8I450 Food Science (R)**1 credit****Gr: 10-12**

Prerequisite: Biology and Integrated Physics & Chemistry (IPC) required; Lifetime Nutrition & Wellness. Principles in Human Services, Principles of Hospitality & Tourism, Hospitality Services, or Culinary Arts are recommended.

Description: [Career and Technical Education course offering science credit] This technical laboratory course provides foundational training in the area of food science and technology. Course topics include the nature of foods, causes of deterioration of foods, principles underlying food processing and the improvement of foods for the consuming public. Students will experiment with foods using scientific methods while preparing meals, studying the nature of ingredients, understanding the chemistry of cooking, and the abstract nature of taste. Laboratory experiments will comprise 40% of the course work. Students will also be given opportunities to express themselves through projects, exhibits, and competitions.

8L300 Forensic Science (R)**1 credit****Gr: 11-12**

Prerequisite: Biology, Chemistry and *Physics (may be concurrent with Physics), Prior completion of one credit in the Law cluster, or in the Health Science cluster

Description: [Career and Technical Education course offering science credit] To receive credit in science, students must meet the 40% laboratory and fieldwork requirement identified. Forensic Science is a course that uses a structured and scientific approach to the investigation of crimes of assault, abuse and neglect, domestic violence, accidental death, homicide, and the psychology of criminal behavior. Students will learn terminology and investigative procedures related to crime scene, questioning, interviewing, criminal behavior characteristics, truth detection, and scientific procedures used to solve crimes. Using scientific methods, students will collect and analyze evidence through case studies and simulated crime scenes such as fingerprint analysis, ballistics, and blood spatter analysis. Students will learn the history, legal aspects, and career options for forensic science.

8O840 Project Lead the Way—Principles of Engineering (R)**1 credit****Gr: 9-12**

Prerequisite: 88740 PLTW Introduction to Engineering Design

Description: [NGHS only] This survey course exposes students to major concepts they'll encounter in a postsecondary engineering course of study. Topics include mechanisms, energy, statics, materials, and kinematics. They develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges, document their work and communicate solutions.

83424 Scientific Research & Design (H)**1 credit****Gr: 10-12**

Prerequisite: Biology

Description: In this course students will conduct laboratory and/or field investigations to describe the natural world using physical, mathematical and conceptual models. Investigations will be conducted by students to learn about a specific area of interest. Scientific investigations will include questioning, observing and drawing conclusions as well as critical thinking and scientific problem solving. A scientific research project is required to be completed for this course.

8H313 Scientific Research & Design - World Health (R)**1 credit****Gr: 10-12**

Prerequisite: Biology and Chemistry

Description: This course examines world health problems and emerging technologies as solutions to these medical concerns. The course is designed to improve students' understanding of the cultural, infrastructural, political, educational, and technological constraints and inspire ideas for appropriate technological solutions to global medical care issues. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. These

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investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom.

33403 On Ramps Geoscience-Earth, Wind, and Fire: An Introduction to Geoscience 0.5 credit Gr: 9-12

Prerequisite:

Description: This dual enrollment science course for high school juniors and seniors introduces students to the major areas in geoscience and helps them develop critical, creative, and geologic problem-solving skills, as applied to 21st century scientific problems. Students will explore the fundamental principles of physics, chemistry, biology, and geosciences to explain Earth processes.

88125 MST Scientific Research & Design - World Health (R) 1 credit Gr: 10-12

MST

Prerequisite: Biology and Chemistry

Description: [NGHS only] This course examines world health problems and emerging technologies as solutions to these medical concerns. The course is designed to improve students' understanding of the cultural, infrastructural, political, educational, and technological constraints and inspire ideas for appropriate technological solutions to global medical care issues. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom.

80310 Engineering Design and Problem Solving (R) 1 credit Gr: 11-12

Prerequisite: Geometry, Algebra 2, Chemistry, and Physics

Description: Engineering design is the creative process of solving problems by identifying needs and then devising solutions. Students use the engineering design process cycle to investigate, design, plan, create and evaluate solutions. 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." The design process and problem solving are inherent to all engineering disciplines. This course reinforces and integrates skills learned in previous mathematics and science courses and emphasizes solving problems, moving from well-defined toward more open ended, with real-world application. Students apply critical-thinking skills to justify a solution from multiple design options. Additionally, the course promotes interest in and understanding of career opportunities in engineering and fosters awareness of the social and ethical implications of technological development.

80710 MST Engineering Design and Problem Solving (R) 1 credit Gr: 11-12

MST

Prerequisite: Geometry, Algebra 2, Chemistry, and Physics

Description: [NGHS only] Engineering design is the creative process of solving problems by identifying needs and then devising solutions. Students use the engineering design process cycle to investigate, design, plan, create and evaluate solutions. 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." The design process and problem solving are inherent to all engineering disciplines. This course reinforces and integrates skills learned in previous mathematics and science courses and emphasizes solving problems, moving from well-defined toward more open ended, with real-world application. Students apply critical-thinking skills to justify a solution from multiple design options. Additionally, the course promotes interest in and understanding of career opportunities in engineering and fosters awareness of the social and ethical implications of technological development.

33428 MST Aquatic Science (H) 1 credit Gr: 10-12

MST

Prerequisite: Biology, IPC, Recommended Chemistry (may be concurrent)

Description: [Math-Science-Technology magnet course offered only at NGHS] Students will conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students will study components of aquatic ecosystems (pond, saltwater, and river), relationships among aquatic organisms, changes within aquatic environments, geological phenomena and fluid dynamics effects, and origin and use of water in a watershed.

NOTE: All courses may not be offered on every campus.



33427 MST Earth Science (H)

1 credit

Gr: 11-12

MST

Prerequisite: Biology, Chemistry, Physics (Three Credits of Science)

Description: [Math-Science-Technology magnet course offered only at NGHS] In this course combining Geology, Meteorology, and Oceanography, students will conduct field and laboratory investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students will study characteristics and conditions of the Earth, formation and history of the Earth, plate tectonics, and origin and composition of minerals and rock and the rock cycle. In addition, they will study processes and products of weathering, natural energy resources, interaction in a watershed, characteristics of oceans, characteristics of the atmosphere, and the role of energy in weather and climate.

8H740 MST Medical Microbiology (H)

1 credit

Gr: 11-12

MST

Prerequisite: Biology, Chemistry, and Physics

Description: [Math-Science-Technology magnet course offered only at NGHS] Students in Medical Microbiology explore the microbial world, studying topics such as pathogenic and non-pathogenic microorganisms, laboratory procedures, identifying microorganisms, drug resistant organisms, and emerging diseases. Diseases of man will be studied. The student will grow bacteria, make slides, learn gram and acid fast staining techniques, learn to identify morphological types of bacteria, how to subculture, do antibiotic sensitivities, test milk for preventative antibiotic presence, and many other diagnostic techniques. Students will also prepare their own plates and slants and grow their own stocks of bacteria.

8H770 MST Pathophysiology (H)

1 credit

Gr: 11-12

MST

Prerequisite: Biology, Chemistry, and Physics

Description: [Math-Science-Technology magnet course offered only at NGHS] Topics included in this course include homeostasis, biological and chemical processes at the cellular level, and examining cells, tissues, organs and systems for the detection of neoplasm. Pathogenic organisms will be studied, as will methods of transmission, prevention, and treatment. Symptoms and effects of disease on the patient will also be studied. MST courses will require an application and acceptance into the magnet program.

8H775 MST Pathophysiology (H)/DC

1 credit

Gr: 11-12

MST D

Prerequisite: Biology, Chemistry, and Physics

Description: [Math-Science-Technology magnet course offered only at NGHS] Topics included in this course include homeostasis, biological and chemical processes at the cellular level, and examining cells, tissues, organs and systems for the detection of neoplasm. Pathogenic organisms will be studied, as will methods of transmission, prevention, and treatment. Symptoms and effects of disease on the patient will also be studied. MST courses will require an application and acceptance into the magnet program.

8O740 MST Project Lead the Way - Principles of Engineering (R)

1 credit

Gr: 9-12

MST

Prerequisite: 8640 MST PLTW Introduction to Engineering Design

Description: [Math-Science-Technology magnet course offered only at NGHS] This survey course exposes students to major concepts they will encounter in a postsecondary engineering course of study. Topics include mechanisms, energy, statics, materials, and kinematics. They develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges, document their work and communicate solutions.

83430 MST Scientific Research & Design (H)

1 credit

Gr: 10-12

MST

Prerequisite: Physics

Description: [Math-Science-Technology magnet course offered only at NGHS] This course is an advanced practicum for the construction of individual student projects and research into individual student problems. It involves the construction of models, analysis of research, development of investigative design, collection, organization and evaluation of qualitative data, and synthesis of valid conclusions from qualitative and quantitative data. Electron Microscopy is the primary research mechanism for this class.

NOTE: All courses may not be offered on every campus.

33114 Biology I (IntH)**1 credit****Gr: 9-12****Prerequisite:** Algebra I (H)

Description: [International Honors course offered only at GHS] IntH Biology prepares students for IB Biology by laying the foundation in basic and advanced laboratory skills, by teaching students to critically question, analyze, and interpret scientific information, by building oral and written science communication skills, and by instilling an awareness of the limitations of scientific knowledge and its constant state of flux. Students must be prepared to spend a minimum of 1/2 hour most evenings for Pre-lab reading and/or lab conclusion writings. Strong math skills, reading comprehension, and the ability to critically analyze data are essential to success in this course. Content of the course will involve exploration of and laboratories relating to: Biology of Man; Biology of Cells; Genetics; Evolution; Ecology; Biology of Plants; and an Independent Project for entrance in the Science Fair. All students will learn to develop an advanced level lab manual.

33122 IB Biology I**1 credit****Gr: 11-12****Prerequisite:** IntH or Pre AP Biology

Description: (IB Biology I is only offered at GHS) This course is designed to prepare students for the IB HL course in grade 12. Topics covered are cell biology, molecular biology, genetics, ecology, evolution and biodiversity and human physiology. Students are expected to participate in projects designed to encourage their involvement in the learning process.

33124 IB Biology II**1 credit****Gr: 11-12****Prerequisite:** IB Biology I and Chemistry I (H or IB)

Description: [International Baccalaureate course offered only at GHS] This course is designed to prepare students for the IB SL/HL Level Biology Exam. This course extends upon concepts of IB Biology I and addresses all essential elements of AP Biology II. Preparation for external exams for college credit is integral to this course. Some field based experience gives students an opportunity to gain insight into a few of the many different professions related to Biology. Students will also have a variety of opportunities to participate in projects designed to encourage their involvement in the learning process. Students are expected to participate in numerous scientific experiments and maintain structured lab notebooks.

33214 IB Chemistry I**1 credit****Gr: 10-12****Prerequisite:** Algebra II (IntH), or concurrent enrollment

Description: [International Baccalaureate course offered only at GHS] This course prepares students for the standard level IB exam by extensive curricula, application based problem solving, extensive advanced labs, and development of lab manuals for external assessment. Students must be prepared to spend a minimum of 1/2 hour most evenings for Pre-lab reading and/or lab conclusion writings. Strong math skills, reading comprehension, and the ability to critically analyze data are essential to success in this course.

33224 IB Chemistry II**1 credit****Gr: 11-12****Prerequisite:** Chemistry I (IB)

Description: [International Baccalaureate course offered only at GHS] This course extends upon concepts of Chemistry I IB and addresses all essential elements of AP Chemistry II. In addition students maintain detailed professional level lab manuals which will be externally evaluated by the European IB designee. Preparation for external exams for college credit is integral to this program.

33312 IB Physics I**1 credit****Gr: 9-12****Prerequisite:** Chemistry I (H or IB), Algebra II (IntH)

Description: [International Baccalaureate course offered only at GHS] This course is designed to build a foundation in the senior year for Standard Level International Baccalaureate Physics. Students use applied mathematics to solve problems from classical physics to relativity and astrophysics and demonstrate acquired knowledge through data collection in laboratory experience, data analysis, and

NOTE: All courses may not be offered on every campus.

evaluation in laboratory reports, textbook problems, and testing. Maintenance of a laboratory report portfolio, and a working scientist's notebook for evaluation by International Baccalaureate examiners is required. Students also participate in the interdisciplinary group 4 project involving Physics I, Chemistry II and Biology II. Concurrent enrollment in 1622 Math Studies or 1632 Mathematics SL (IB) is recommended.

33315 IB Physics II**1 credit****Gr: 11-12**

Prerequisite: Physics I (IB), Chemistry I (H or IB)

Description: [International Baccalaureate course offered only at GHS] This course is designed to meet the requirements for the second year of International Baccalaureate SL/HL Physics. This course expands on all the concepts introduced in IB Physics I, and specifically prepares students for the IB SL/HL Physics exam for possible college credit, and entrance into a university physics, math or engineering program. Students demonstrate acquired knowledge through data collection in laboratory experience, data analysis and evaluation in laboratory reports, textbook problems, and testing, and maintain a laboratory report portfolio, in conjunction with a working scientist's notebook for evaluation by International Baccalaureate examiners. Concurrent enrollment in IB 1627 Mathematics (HL) is recommended.

33431 IB Environmental Systems SL**1 credit****Gr: 11-12**

Prerequisite: Chemistry I (H or IB), Algebra II (IntH)

Description: [International Baccalaureate course offered only at GHS] The prime intentions of this course are to provide students with a coherent perspective of the interrelationships between environmental systems and societies, and to enable students to adopt an informed personal response to the wide range of pressing environmental issues. Teaching approach will be conducive to students evaluating the scientific, ethical and socio-political aspects of the issues. This course will combine the techniques and knowledge associated with Group 4 (the experimental sciences) with those associated with Group 3 (individual and society). IB students will be able to use this course as an IB Diploma required 6th subject and as a 4th science credit required for high school graduation.

33435 IB Sports, Exercise, and Health Science**2 credits****Gr: 12**

Prerequisite: IntH Biology, IntH Algebra II

Description: An experimental science course combining academic study with practical and investigative skills. The course incorporates the discipline of anatomy and physiology, biomechanics, psychology, and nutrition. Students cover a range of core and option topics and carry out practical experimentation investigations in both laboratory and field settings.