CREDITS REQUIRED: 3

All high school science courses are based on the Next Generation Science Standards (NGSS) and the CPS Science Content Framework. The Science and Engineering Practices and Cross Cutting Concepts of the NGSS provide common expectations across all courses about how students should be engaging in scientific inquiry, analysis, and communication. These Practices and Cross Cutting Concepts should be integrated into the major content of each core course as defined by the CPS Science Content Framework.

Chicago Public Schools' minimum high school graduation requirement for Science is 3.0 credits that includes Biology (1.0 credit) and other Laboratory Science Courses (a combination of the following four courses at either 0.5 or 1.0 credit each for a total of 2.0 credits. No more than 1.0 credit in one course may be used towards satisfaction of the science requirement):

1. Chemistry
2. Earth and Space Science
3. Environmental Science
4. Physics

Credit is awarded in Carnegie Units that are equivalent to 120 hours of instructional time and include 30 hours of laboratory work. All courses meeting the science requirement for graduation must be laboratory based. In each science course, schools have the option to develop an integrated or thematic equivalent of subject area courses as long as standards are met.

It is expected that at the end of each science course students will not only have learned the Big Ideas (as outlined in the CPS Science Content Framework) but also will have developed understandings about inquiry and the nature of science that connect to other science courses they will take.

**Biology**

**Course Number:** 332101R / 332102R  
**Course Level:** Regular  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Biology; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).  
**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**

Biology is a standard introductory course into the scientific study of life and life processes that is designed for students who are developing their problem-solving and analytical skills. Students taking Biology will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as the structure, function and information processing, matter and energy in organisms, inheritance and variation of traits, natural selection, and evolution.
**Course Descriptions**

### Honors Biology

**Course Number:** 332101H / 332102H  
**Course Level:** Honors  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Biology; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).  
**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**

Biology is a standard introductory course into the scientific study of life and life processes that is designed for students who are developing their problem-solving and analytical skills. Students taking Biology will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as the structure, function and information processing, matter and energy in organisms, inheritance and variation of traits, and natural selection, and evolution. In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of Biology H will prepare students for future honors and AP coursework.

### Biology HH

**Course Number:** 332111H / 332112H  
**Course Level:** Honors  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Biology; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).  
**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**

Biology is an introductory course that explores the patterns, processes, and relationships of living organisms. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about the disciplinary core ideas of structure, function and information processing, matter and energy in organisms, inheritance and variation of traits, and biological evolution. This course integrates the International Baccalaureate Middle Years Program’s Approaches to Learning and Global Contexts to foster the development of community responsibility and 21st century learning skills. In this course, students will develop research skills, technical writing skills, and the ability to comprehend and analyze complex texts.

This course is for students enrolled in Lincoln Park’s Double Honors Program.

### Biology PDP

**Course Number:** 332121H / 332122H  
**Course Level:** Honors  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Biology; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).  
**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**

PDP Biology is an accelerated introductory course that explores the life science disciplinary core ideas while engaging students in the Science and Engineering practices. Students will plan and carry out investigations and construct explanations about topics such as ecosystems, heredity, evolution, and the key structures and processes of life. Students will participate in more advanced problem solving and extend their learning to science projects outside of the classroom, developing advanced research...
and writing skills in science. Successful completion of PDP Biology will prepare students for future IB and/or AP Biology coursework.

Honors Organismal Biology

Course Number: 321101H / 321102H
Course Level: Honors
Prerequisites: Biology and Chemistry
Number of Credits Earned: 1.0

Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Teacher Certification Required: Biology

COURSE DESCRIPTION

Honors Organismal Biology is an advanced course which builds upon the life science disciplinary core ideas. Throughout this course, students will engage in laboratory investigations, hands-on activities, research projects, and scientific presentations to explore the key topics of Infectious Diseases and Animal Systems. Students will understand the development of emerging communicable diseases by exploring topics such as bacterial and viral infections, ecosystems, pathogenic parasites and populations. Students will explain the structure and function of mammalian systems by exploring complex human disorders such as heart disease and diabetes. This course will deepen student understanding of the role of current research in the diagnosis, prevention, control and treatment of disease. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards.

Honors Physics

Course Number: 333101H / 333102H
Course Level: Honors
Prerequisites: None
Number of Credits Earned: 1.0

Type of Graduation Credit Earned: Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Teacher Certification Required: Physics

COURSE DESCRIPTION

Physics is a standard introductory course into the scientific study of forces, motions, waves and energy that is designed for students who are developing their problem-solving and analytical skills. Students taking Physics will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as force and motion, waves, and interactions of energy and matter.

Physics

Course Number: 333101R / 333102R
Course Level: Regular
Prerequisites: None but require Algebra as co-requisite course

Number of Credits Earned: 1.0

Type of Graduation Credit Earned: Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Teacher Certification Required: Physics

COURSE DESCRIPTION

Physics is a standard introductory course into the scientific study of forces, motions, waves and energy that is designed for students who are developing their problem-solving and analytical skills. Students taking Physics will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as force and motion, waves, and interactions of energy and matter.
Science

Course Descriptions

In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of Physics H will prepare students for future honors and AP coursework.

Physics HH

Course Number: 333111H / 333112H
Course Level: Honors
Prerequisites: None but require Algebra as co-requisite course
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Teacher Certification Required: Physics

COURSE DESCRIPTION
Physics is an introductory course that explores the scientific study of the interactions occurring in systems in terms of the forces between objects, the related energy transfers between interacting objects, and the consequences of these energy transfers. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about the disciplinary core ideas of force and motion, waves, and interactions of energy and matter. This course integrates the International Baccalaureate Middle Years Program’s Approaches to Learning and Global Contexts to foster the development of community responsibility and 21st century learning skills. In this course, students will develop research skills, technical writing skills, and the ability to comprehend and analyze complex texts.

This course is for students enrolled in Lincoln Park’s Double Honors Program.

Physics PDP

Course Number: 333121H / 333122H
Course Level: Honors
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Teacher Certification Required: Physics

COURSE DESCRIPTION
PDP Physics is an accelerated introductory course into the scientific study of forces, motions, waves and energy that is designed for students who are developing their problem-solving and analytical skills in preparation for an advanced study of IB Physics. Students taking PDP Physics will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as force and motion, waves, and interactions of energy and matter. Students will participate in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of PDP Physics will prepare students for future IB and/or AP Physics coursework.

Chemistry

Course Number: 334101R / 334102R
Course Level: Regular
Prerequisites: None but require Algebra as co-requisite course
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Chemistry; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Science

Course Descriptions

**Teacher Certification Required:** Chemistry

**COURSE DESCRIPTION**
Chemistry is a standard introductory course into the scientific study of the properties of matter and the changes that matter undergoes during reactions that is designed for students who are developing their problem-solving and analytic skills. Students taking Chemistry will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as structure and properties of matter and chemical reactions.

**Honors Chemistry**

**Course Number:** 334101H / 334102H
**Course Level:** Honors
**Prerequisites:** None
**Number of Credits Earned:** 1.0
**Type of Graduation Credit Earned:** Chemistry; Career Ed; Elective
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
**Teacher Certification Required:** Chemistry

**COURSE DESCRIPTION**
Chemistry is an introductory course that explores the structure of matter at the atomic and subatomic scales to discover how it influences the system's larger scale structures, properties, and functions. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about the disciplinary core ideas of structure and properties of matter and chemical reactions. Students will explain real world phenomena in terms of the forces between atoms and molecules, the related energy transfers, and the resulting chemical reactions that occur from these transfers.

This course integrates the International Baccalaureate Middle Years Program’s Approaches to Learning and Global Contexts to foster the development of community responsibility and 21st century learning skills. In this course, students will develop research skills, technical writing skills, and the ability to comprehend and analyze complex texts.

This course is for students enrolled in Lincoln Park’s Double Honors Program.

**Chemistry HH**

**Course Number:** 334111H / 334112H
**Course Level:** Honors
**Prerequisites:** None
**Number of Credits Earned:** 1.0
**Type of Graduation Credit Earned:** Chemistry; Career Ed; Elective
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
**Teacher Certification Required:** Chemistry

**COURSE DESCRIPTION**
Chemistry is an introductory course that explores the structure of matter at the atomic and subatomic scales to discover how it influences the system’s larger scale structures, properties, and functions. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as structure and properties of matter and chemical reactions. Successful completion of Chemistry H will prepare students for future honors and AP coursework.

**Chemistry PDP**

**Course Number:** 334121H / 334122H
Science

Course Descriptions

Course Level: Honors
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Chemistry; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Teacher Certification Required: Chemistry

COURSE DESCRIPTION

PDP Chemistry is a lab-based, data driven, inquiry-oriented course involving principles and concepts concerning the physical world. Students will construct, analyze, and refine models of matter to understand such topics as atomic structure, chemical bonding, reactions, mass relationships, states of matter, equilibrium, acids & bases, and kinetics. Emphasis is placed on the study and proper use of fundamental science tools including the metric system, periodic table, graphing techniques and experimental design. Students will be required to follow the IB internal assessment format for formal labs. Successful completion of PDP Chemistry will prepare students for future IB and/or AP Chemistry coursework.

Honors Organic Chemistry

Course Number: 334301H / 334302H
Course Level: Honors
Prerequisites: Completion of Chemistry
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Chemistry; Career Ed; Elective
Recommended Course Duration: 2 Semesters
Teacher Certification Required: Chemistry

COURSE DESCRIPTION

This course is meant to act as a rigorous introduction to organic chemistry topics and concepts. The students will engage in labs and complete assignments similar to those found in a first semester organic chemistry class. The high school setting will obviously lead to certain limitations (most notably in the labs we will be able to conduct) and also yield certain benefits (we will meet five times a week for 45 minutes instead of only three times a week). Student will review many of the concepts that they learned earlier in AP or Honors Chemistry and build upon that foundation. We will discuss bonding, molecular structure, nomenclature of organic compounds and designating isomers, intermolecular forces, and reaction intermediate stability in the first part of the class. Once these topics have been mastered the focus of the class will shift to organic reactions. While memorization will play a role in any organic chemistry class particular attention will be paid to understanding reaction mechanisms and “pushing electrons”. We will study addition, elimination, and substitution reactions. We will then focus on nucleophilic attack and electrophilic addition reactions. The course will conclude with separations techniques and a review of concepts prior to the final exam. The final exam will be high stakes and cumulative. A description of lab activities and breakdown of unit topics is to follow.

Honors Consumer Chemistry

Course Number: 334601H / 334602H
Course Level: Honors
Prerequisites: General Chemistry or Honors Chemistry
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 1 Semesters
Teacher Certification Required: Science

COURSE DESCRIPTION

Honors Consumer Chemistry is an elective course designed to explore the important role of chemistry in everyday life including nutrition, food chemistry, obesity, GMOs, vitamins, medicine, and health. Students will develop and use knowledge of matter and its chemical properties to make informed decisions about the application of science and technology to enhance the quality of their lives. From designing cosmetics and cheese to investigating the chemistry of plant pigments and meat proteins, this lab based course places a heavy emphasis on critical thinking and decision making skills. Students will engage
in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to develop an understanding of chemical reactions and other disciplinary core ideas in Physical Science.

### Earth and Space Science

**Course Number:** 335101R / 335102R  
**Course Level:** Regular  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Earth and Space Science; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).  
**Teacher Certification Required:** Physical Science  

**COURSE DESCRIPTION**  
Earth and Space Science is a standard introductory course into the scientific study of earth’s lithosphere, hydrosphere, atmosphere, and celestial environment that is designed for students who are developing their problem-solving and analytical skills. Students taking Earth and Space Science will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as energy sources and resources, Earth’s place in the Universe, geosphere, and fluid sphere.  

In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of Earth and Space Science H will prepare students for future honors and AP coursework.

### Honors Earth and Space Science

**Course Number:** 335101H / 335102H  
**Course Level:** Honors  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Earth and Space Science; Career Ed; Elective  

**COURSE DESCRIPTION**  
In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of Earth and Space Science H will prepare students for future honors and AP coursework.

### Environmental Science

**Course Number:** 339101R / 339102R  
**Course Level:** Regular  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Environmental Science; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).  
**Teacher Certification Required:** Life Science  

**COURSE DESCRIPTION**  
Environmental Science is a standard introductory course into the scientific study of the mutual relationships between organisms and their environment that is designed for students who are developing their problem-solving and analytic skills. Students taking Environmental Science will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as energy sources and resources, Earth’s place in the Universe, geosphere, and fluid sphere.
opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as interrelations between organisms and the environment, cycles of matter and energy transfers in ecosystems, and natural resources.

Honors Environmental Science

Course Number: 339101H / 339102H
Course Level: Honors
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Environmental Science; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Teacher Certification Required: Life Science

COURSE DESCRIPTION
Environmental Science is a standard introductory course into the scientific study of the mutual relationships between organisms and their environment that is designed for students who are developing their problem-solving and analytic skills. Students taking Environmental Science will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as interrelations between organisms and the environment, cycles of matter and energy transfers in ecosystems, and natural resources.

In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of Environmental Science H will prepare students for future honors and AP coursework.

Forensic Science

Course Number: 302101R / 302102R
Course Level: Regular
Prerequisites: none
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Biology or Chemistry

COURSE DESCRIPTION
Forensic Science is an investigative elective course that focuses on scientific problem solving within a relevant context. Forensics is a multidisciplinary applied science encompassing several sub-fields of biology, chemistry, physics and crime scene investigation. These sub-fields include genetics, toxicology, entomology, ballistics, pathology, fire debris and trace evidence. The course utilizes an inquiry-based approach, including examining mock crime scenes or analyzing evidence in laboratory investigations, in order to consider how scientific methods and evidence are used to substantiate legal investigations. Students will apply knowledge of biotechnology in order to analyze forensic scenarios. Students in this course should expect to develop Science and Engineering practices as outlined in the Next Generation Science Standards.

Honors Forensic Science

Course Number: 302101H / 302102H
Course Level: Honors
Prerequisites:
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science

COURSE DESCRIPTION
Honors Forensic science involves the study and use of scientific concepts and technologies related to solving
crime in society. This course expands upon the topics learned in chemistry, biology, physics and other sciences. Students learn how forensic science is used to investigate geology, entomology, anthropology, odontology, toxicology, botany, and serology. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as structure and properties of matter and chemical reactions, structure, function and information processing, matter and energy in organisms, and interactions of energy and matter. The course focuses on science practices including problem solving, designing experiments, testing, and making conclusions based on empirical evidence. Writing is an integral part of the course with students being expected to communicate laboratory reports, results, and conclusions, and analyze case studies.

Honors Aerospace Science

Course Number: 335201H / 335202H
Course Level: Honors
Prerequisites: Completion or concurrent enrollment in Physics
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science

COURSE DESCRIPTION

Aerospace Science is a course featuring concepts and skills from physics that specifically apply to the design, construction and testing of both fixed-wing aircraft and rockets. This course explores the evolution of flight, flight fundamentals, navigation and control, materials, propulsion, space travel, orbital mechanics, remotely controlled systems and related careers. These topics are all addressed within a historical context. This course places emphasis on physical science literacy and applying physics concepts to think critically and solve problems related to flight and rocket motion. This course uses algebra and trigonometry to solve problems and generate models to better understand and characterize physical processes. This course requires the use of simulation programs to create and test designs.

Aerospace Science emphasizes the skills necessary to perform engineering, including the creation of conceptual designs, the computer modelling and testing of specific designs, the fabrication of parts, the construction of the prototype and its evaluation. Students will be required to document all phases of their designs in a laboratory notebook (to be used exclusively for Aerospace Science) and complete and submit their designs by the designated due date. Additionally, students will be expected to evaluate the designs of their peers and offer constructive criticism towards the improvement of them.

Astronomy

Course Number: 350101R / 350102R
Course Level: Regular
Prerequisites: Earth and Space Science
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Earth and Space Science; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Teacher Certification Required: Physics

COURSE DESCRIPTION

Astronomy is an elective science course that introduces students to the study of the universe, solar system, stars, and galaxies. Students taking Astronomy will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about the origin and history of the Universe and the formation of the solar system, stars, and galaxies.

Honors Astronomy

Course Number: 350101H / 350102H
Course Level: Honors
**Course Descriptions**

**Science**

**Prerequisites:** None

**Number of Credits Earned:** 1.0

**Type of Graduation Credit Earned:** Earth and Space Science; Career Ed; Elective

**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).

**Teacher Certification Required:** Physics

**COURSE DESCRIPTION**

Astronomy is an elective science course that introduces students to the study of the universe, solar system, stars, and galaxies. Students taking Astronomy will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about the origin and history of the Universe and the formation of the solar system, stars, and galaxies.

In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom.

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**Honors Physical Geology**

**Course Number:** 303201H / 303202H

**Course Level:** Honors

**Prerequisites:** None

**Number of Credits Earned:** 1.0

**Type of Graduation Credit Earned:** Career Ed; Elective

**Recommended Course Duration:** 3 semesters

**Teacher Certification Required:** Earth Science

**COURSE DESCRIPTION**

Physical Geology is an elective course where students will investigate the phenomena of the Earth’s Systems to understand geologic patterns and change. Students will explore the dynamic environment of the Earth’s surface and interior while developing proficiency in the scientific principles and practices used in the geologic study of the Earth. Students will read advanced texts, perform investigations, and complete research to explore topics including plate tectonics, mineral analysis, the dynamics of flooding, and soil erosion. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards in order to learn about the disciplinary core idea of Earth’s Systems.

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**Physics II**

**Course Number:** 353201R / 353202R

**Course Level:** Regular

**Prerequisites:** Physics I

**Number of Credits Earned:** 1.0

**Type of Graduation Credit Earned:** Physics; Career Ed; Elective

**Recommended Course Duration:** 2 semesters

**Teacher Certification Required:** Physics

**COURSE DESCRIPTION**

Physics II is a cross-curricular course that combines the practices of physics, chemistry, biology, earth and space science, and environmental science to reflect the ever-changing nature of science and technology. This project-based course requires students to conduct individual and/or partner projects, utilizing cooperative learning strategies to master knowledge and skills in these areas. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as structure and properties of matter, matter and energy in organisms, force and motion, waves, and interactions of energy and matter.

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**Honors Physics II**

**Course Number:** 353201H / 353202H

**Course Level:** Honors

**Prerequisites:** Physics I

**Number of Credits Earned:** 1.0

**Type of Graduation Credit Earned:** Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Physics

COURSE DESCRIPTION
Honors Physics II is a cross-curricular course that combines the practices of physics, chemistry, biology, earth and space science, and environmental science to reflect the ever-changing nature of science and technology. This project-based course requires students to conduct individual and/or partner projects, utilizing cooperative learning strategies to master knowledge and skills in these areas. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as structure and properties of matter, matter and energy in organisms, force and motion, waves, and interactions of energy and matter.

NASA Capstone Climate

Course Number: 399301R / 399302R
Course Level: Regular
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Earth Science or Biology

COURSE DESCRIPTION
NASA Capstone Climate Change is a research-driven course where students will explore the key indicators for global climate change and determine the impact factors of these on the earth’s climate. This course is designed for students to evaluate current scientific ideas about global climate change through an original research project. Students will learn how to utilize and evaluate current climate predictor models and generate an explanation of how climate change will impact living systems over time. This course emphasizes the NGSS Science and Engineering Practices in order to develop conceptual knowledge about the core ideas of earth science. Student will research and analyze scientific texts in order to discuss differences in scientific opinions as related to global climate change.

Honors NASA Capstone Climate

Course Number: 399301H / 399302H
Course Level: Honors
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Earth Science or Biology

COURSE DESCRIPTION
Honors NASA Capstone Climate Change is a research-driven course where students will explore the key indicators for global climate change and determine the impact factors of these on the earth’s climate. This course is designed for students to evaluate current scientific ideas about global climate change through an original research project. Students will learn how to utilize and evaluate current climate predictor models and generate an explanation of how climate change will impact living systems over time. This course emphasizes the NGSS Science and Engineering Practices in order to develop conceptual knowledge about the core ideas of earth science. Student will research and analyze scientific texts in order to discuss differences in scientific opinions as related to global climate change.

In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of Honors NASA Capstone Climate will prepare students for future honors and AP coursework.

Anatomy and Physiology

Course Number: 391101R / 391102R
Course Level: 
Prerequisites: None
Number of Credits Earned: 
Type of Graduation Credit Earned: Career Ed; Elective
**Course Descriptions**

**Recommended Course Duration:** 2 semesters  
**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**  
Anatomy and Physiology explores the structures and functions of systems in the human body including the circulatory, respiratory, endocrine, and reproductive systems. This course is usually taken after a comprehensive initial study of biology. Students will explore the role of diagnostic tools and research in the prevention and control of disease. Students will engage in lab work, hands-on activities, research projects, and presentations. Anatomy and Physiology is recommended for any student considering a career in biology or the medical field.

**Honors Anatomy and Physiology**

**Course Number:** 391101H / 391102H  
**Course Level:**  
**Prerequisites:** none  
**Number of Credits Earned:**  
**Type of Graduation Credit Earned:** Career Ed; Elective  
**Recommended Course Duration:** 2 semesters  
**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**  
Anatomy and Physiology explores the structures and functions of systems in the human body including the circulatory, respiratory, endocrine, and reproductive systems. This course is usually taken after a comprehensive initial study of biology. Students will explore the role of diagnostic tools and research in the prevention and control of disease. Students will engage in lab work, hands-on activities, research projects, and presentations. Anatomy and Physiology is recommended for any student considering a career in biology or the medical field.  

In an honors class, students will be expected to engage in more advanced content and extend their learning to science projects outside of the classroom, which may include extended laboratory investigations and research papers.

**Honors Atmospheric Science**

**Course Number:** 306101H / 306102H  
**Course Level:**  
**Prerequisites:** none  
**Number of Credits Earned:**  
**Type of Graduation Credit Earned:** Earth and Space Science; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters  
**Teacher Certification Required:** Earth Science

**COURSE DESCRIPTION**  
Atmospheric Science is an elective science course that explores the concepts of meteorology and climatology, including: Weather Elements and Observations; Atmospheric Temperature, Analysis and Forecasting; Satellite and Radar Interpretation; and Climate Change. This course emphasizes the principles of physics and earth science in order to understand the complex interactions of the Earth’s atmosphere with the lithosphere and biosphere. Students will develop science and engineering practices as they learn the process of forecasting in order to interpret and explain a wide variety of weather and climatic data.

**Zoology**

**Course Number:** 390101R / 390102R  
**Course Level:** Regular  
**Prerequisites:** Biology  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work)  
**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**  
Zoology is an introductory course about the scientific study of the animal kingdom including the topics of classification, anatomy, physiology, and ecology. This course emphasizes
Science

Course Descriptions

an inquiry-based approach which includes dissections, case studies and fieldwork. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as social interactions and group behavior in ecosystems, biological evolution, and the growth and development of organisms.

Honors Zoology

Course Number: 390101H / 390102H
Course Level: Honors
Prerequisites: Biology
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work)
Teacher Certification Required: Biology

COURSE DESCRIPTION
Honors Zoology is lab-based course about the scientific study of the animal kingdom. Students will learn about zoology by investigating the characteristics of animals, classification methods, anatomy and physiology, animal behavior, life cycles, and habitat conservation. Students will design and conduct ongoing scientific investigations including fieldwork in local habitats. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as social interactions and group behavior in ecosystems, biological evolution, and the growth and development of organisms.

Botany

Course Number: 398201R / 398102R
Course Level: Regular
Prerequisites: Biology
Number of Credits Earned: 1.0

Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work)
Teacher Certification Required: Biology

COURSE DESCRIPTION
Botany is an introductory course about the anatomy, physiology, propagation, and identification of plants. Students will research the ecological and economic importance of plants and consider the practical application of plants such as landscape design, floral design, and horticulture. This course emphasizes the development of scientific research and laboratory skills through ongoing fieldwork and laboratory investigations. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as structure and function, growth and development of organisms, adaptation, and interdependent relationships in ecosystems.

Honors Genetics

Course Number: 308101H / 308102H
Course Level: Honors
Prerequisites: Biology
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work)
Teacher Certification Required: Biology

COURSE DESCRIPTION
Genetics is the study of genes, heredity, and variation in living organisms. In Honors Genetics, students will learn about the transmission and expression of genetic information. Topics include the mechanisms of inheritance as well as the relationship between structure and function. Students will investigate the principles of population genetics and how these principles drive the process of evolution. This course will explore the ethical questions raised by the use of biotechnology in the field of genetics.
Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as the structure and properties of matter and chemical reactions, structure, function and information processing, inheritance and variation of traits, and evolution.

**Engineering Design**

**Course Number:** 384101R / 384102R  
**Course Level:** Regular  
**Prerequisites:**  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work)  
**Teacher Certification Required:** Physics

**COURSE DESCRIPTION**

Regular Engineering Design provides students with an introduction to engineering and machine design. Students will explore the fundamentals of engineering through the application of scientific principles to manufacturing processes. Students will conduct independent and collaborative investigations and solve problems relating to many fields of engineering, with an emphasis on practical design considerations. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as force and motion, waves, and interactions of energy and matter.

**Honors Engineering Design II**

**Course Number:** 384001H / 384002H  
**Course Level:** Honors  
**Prerequisites:** Introductory Engineering Course  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work)  
**Teacher Certification Required:** Physics

**COURSE DESCRIPTION**

This course is an advanced engineering design course for students who have successfully completed a year of introductory engineering coursework. In this course, students utilize and strengthen their understanding of the engineering design process, applying math, science, and engineering concepts to hands-on design projects. Students will build upon existing ideas about materials, forces, energy, electrical systems, environmental engineering, and the impact of engineering on society. Engineering design projects emphasizing teamwork, problem solving, and decision making will be incorporated throughout the class. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as force and motion, waves, and interactions of energy and matter.
Science

Course Descriptions

Education and the Next Generation Science Standards to learn about essential Big Ideas such as force and motion, waves, and interactions of energy and matter.

Honors EPICS: Engineering Projects in Community Service

**Course Number:** 384501H / 384502H  
**Course Level:** Honors  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Career Ed; Elective  
**Recommended Course Duration:** 2 semesters  
**Teacher Certification Required:** Science or Engineering

**COURSE DESCRIPTION**

EPICS is a design-based, service learning program that teaches students about engineering, computing and technology fields while civically engaging them in their local communities. EPICS was founded at Purdue University and can now be found nationally and internationally. In EPICS, teams of students work on projects to address the engineering and technology-based needs of community service and education organizations. Successful students in EPICS will be ready to apply their critical thinking skills to unfamiliar or new scenarios in the future. Students will leave the class having first-hand experience with various hand, power and advanced technological tools in addition to the design and build process of engineering.

Honors Aquatic and Marine Science

**Course Number:** 358101H / 358102H  
**Course Level:** Honors  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Career Ed; Elective  
**Recommended Course Duration:** 2 semesters  
**Teacher Certification Required:** Science or Engineering

**COURSE DESCRIPTION**

Honors Aquatic Science is an interdisciplinary course that examines living and non-living interactions in aquatic systems. In this course, students will develop projects and conduct research in order to learn about the flow of energy and matter in marine and freshwater ecosystems. Students will construct models of the geologic processes responsible for the formation of aquatic environments. This course provides students with the opportunity to design and evaluate solutions for reducing the human impact on ecosystems. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards in order to learn about the disciplinary core ideas of Physical, Life, and Earth and Space Sciences.

Honors Biochemistry

**Course Number:** 305101H / 305102H  
**Course Level:** Honors  
**Prerequisites:** Biology, Chemistry  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Chemistry; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work)  
**Teacher Certification Required:** Biology and Chemistry

**COURSE DESCRIPTION**

All biological processes (including vision, thinking, digestion, immunity, motion, and disease conditions) result from how molecules interact in living systems. In Honors Biochemistry, students apply knowledge of organic molecules and the principles of chemistry to explain the biochemical mechanisms underlying life’s processes. Students will investigate these processes through weekly laboratory investigations, analysis of current research, and the discussion of ethical issues surrounding the most current applications of biochemistry. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as structure and properties of matter and
chemical reactions.

**Biotechnology**

**Course Number:** 395101R / 395102R  
**Course Level:** Regular  
**Prerequisites:** Biology  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work)  
**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**
This course is designed to introduce students to the biotechnology industry and for students to develop basic research techniques that can be further developed in future science classes. Students will be able to apply biology and chemistry concepts to biotechnology topics. Major units of instruction (modules) include an introduction to biotechnology; development and interactions with antibiotics; bacteria growth; human diseases and use of vaccines; proteins and bioinformatics; cloning and manipulating DNA including PCR; and bioethics. This course is aligned with the Next Generation Science Standards. Students will engage in the Sciences and Engineering Practices as outlined in the Next Generation Science Standards to model new concepts, develop procedures for carrying out experiments, and share information with their peers through projects and presentations.

**Honors Biotechnology**

**Course Number:** 395101H / 395102H  
**Course Level:** Honors  
**Prerequisites:** Biology  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work)  
**Teacher Certification Required:** Biology

**Honors Evolutionary Biology**

**Course Number:** 312101H / 312102H  
**Course Level:** Honors  
**Prerequisites:** None  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Biology; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters  
**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**
Honors Evolutionary Biology is a course that explores the unity and diversity of species by examining the scientific evidence for biological evolution. Students will engage in investigations and analyze and interpret data in order to reconstruct scientific explanations about the mechanisms about evolution. Students will use computational models and simulations to demonstrate key features of evolutionary theories. By engaging in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards, students will develop a strong conceptual understanding of the evidence for common ancestry, the history of life on earth, and the influence of the environment on populations.
Science

Course Descriptions

**Honors Senior Project I Science**

Course Number: 396101H / 396102H  
Course Level: Honors  
Prerequisites: 3 Lab Sciences  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Elective  
Recommended Course Duration: 2 semesters  
Teacher Certification Required: Science  

**COURSE DESCRIPTION**
The Honors Senior Project I Science is designed to give twelfth grade students the opportunity to extend learning beyond the school's standard course offerings. The Honors Senior Project for Science course can take the form of an independent study course or research project. An independent study course might be an in-depth investigation into a topic of interest such as neuroscience or zoology. A research project may be a laboratory or field-based investigation around a scientific question. In this course, students will develop and launch a structured plan for learning in order to answer and find new questions about a science topic of interest.

**Advanced Senior Project I Science**

Course Number: 396101A / 396102A  
Course Level: Advanced  
Prerequisites: 3 Lab Sciences  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Elective  
Recommended Course Duration: 2 semesters  
Teacher Certification Required: Science  

**COURSE DESCRIPTION**
Advanced Senior Project Science is designed to give twelfth-grade students the opportunity to conduct scientific research in partnership with a university laboratory. This course allows students to gain hands-on research experience at a professional lab, produce novel results, and engage in rigorous science literature reviews, writing, and communicating scientifically. The course requires the completion of a research paper and formal presentation. A research project may be a laboratory or field-based investigation, building upon prior student knowledge and interests. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to explore and make connections between the Disciplinary Core Ideas.

**Honors Science Research Capstone**

Course Number: 396501H / 396502H  
Course Level: Honors  
Prerequisites: Biology & Two Lab Sciences  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Elective  
Recommended Course Duration: 2 semesters  
Teacher Certification Required: Science  

**COURSE DESCRIPTION**
In Honors Science Research Capstone, students will engage in the work of scientists by reading, writing, researching, and developing authentic scientific research. Students will critically engage in conversations about scientific topics and communicate scientific findings via multiple formats. This course is a modified version of the AP Capstone curriculum, taught in one year for students students to develop many of the skills. This course expands opportunities for students to focus on areas of science that are of interest to them. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to explore and make connections between the Disciplinary Core Ideas.

**IB MYP Biology**

Course Number: 351101R / 351102R  
Course Level: Regular
Science

Course Descriptions

**Science**

**Prerequisites:** None

**Number of Credits Earned:** 1.0

**Type of Graduation Credit Earned:** Biology; Career Ed; Elective

**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work).

**Teacher Certification Required:** Biology

**COURSE DESCRIPTION**

The International Baccalaureate Middle Years Programme (MYP) is a philosophy of teaching and an approach to instruction. Students in the MYP explore significant content, develop skills, and deepen conceptual understanding through their engagement with global contexts. Teachers will plan using the MYP objectives and assess using the MYP criteria. Biology is a standard introductory course into the scientific study of life and life processes that is designed for students who are developing their problem-solving and analytical skills. Students taking Biology will regularly experience hands-on, inquiry-based learning opportunities.

Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as the structure, function and information processing, matter and energy in organisms, inheritance and variation of traits, natural selection, and evolution.

In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of Biology H will prepare students for future IB, honors, and AP coursework.

**IB HL Biology I**

**Course Number:** 351101A / 351102A

**Course Level:** Advanced

**Prerequisites:** None

**Number of Credits Earned:** 1.0

**Type of Graduation Credit Earned:** Biology; Career Ed; Elective

**Recommended Course Duration:** 2 semesters

**Teacher Certification Required:** Science

**Links:** Click [here](#) for a link with more detailed information about the course

**COURSE DESCRIPTION**

The biology course is organized by topics, SL students study six topics and HL students study a further five, with some of these taking the first six topics to greater depth. In addition
Science

Course Descriptions

to this, students study two out of a choice of seven (at SL) or five (at HL) option topics. There are four basic biological concepts that run throughout: Structure and function; Universality versus diversity; Equilibrium within systems; and Evolution. These four concepts serve as themes that unify the various topics that make up the three sections of the course: the core, the additional higher level (AHL) material and the options.

IB HL Biology II

Course Number: 351201A / 351202A
Course Level: Advanced
Prerequisites: IB HL Biology I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Biology; environmental science; career ed; elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
The biology course is organized by topics, SL students study six topics and HL students study a further five, with some of these taking the first six topics to greater depth. In addition to this, students study two out of a choice of seven (at SL) or five (at HL) option topics. There are four basic biological concepts that run throughout: Structure and function; Universality versus diversity; Equilibrium within systems; and Evolution. These four concepts serve as themes that unify the various topics that make up the three sections of the course: the core, the additional higher level (AHL) material and the options.

IB SL Biology II

Course Number: 351401A / 351402A
Course Level: Advanced
Prerequisites: IB SL Biology I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Biology; environmental science; career ed; elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
The biology course is organized by topics, SL students study six topics and HL students study a further five, with some of these taking the first six topics to greater depth. In addition to this, students study two out of a choice of seven (at SL) or five (at HL) option topics. There are four basic biological concepts that run throughout: Structure and function; Universality versus diversity; Equilibrium within systems; and Evolution. These four concepts serve as themes that unify the various topics that make up the three sections of the course: the core, the additional higher level (AHL) material and the options.

IB SL Biology I

Course Number: 351301A / 351302A
Course Level: Advanced
Prerequisites: None

COURSE DESCRIPTION
The biology course is organized by topics, SL students study six topics and HL students study a further five, with some of these taking the first six topics to greater depth. In addition to this, students study two out of a choice of seven (at SL) or five (at HL) option topics. There are four basic biological concepts that run throughout: Structure and function;
Universality versus diversity; Equilibrium within systems; and Evolution. These four concepts serve as themes that unify the various topics that make up the three sections of the course: the core, the additional higher level (AHL) material and the options.

IB MYP Chemistry

Course Number: 375101R / 375102R
Course Level: Regular
Prerequisites: None but require Algebra as co-requisite course
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Chemistry; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work).
Teacher Certification Required: Chemistry

COURSE DESCRIPTION
The International Baccalaureate Middle Years Programme (MYP) is a philosophy of teaching and an approach to instruction. Students in the MYP explore significant content, develop skills, and deepen conceptual understanding through their engagement with global contexts. Teachers will plan using the MYP objectives and assess using the MYP criteria. Chemistry is a standard introductory course into the scientific study of the properties of matter and the changes that matter undergoes during reactions that is designed for students who are developing their problem-solving and analytic skills. Students taking Chemistry will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as structure and properties of matter and chemical reactions.

In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of Chemistry H will prepare students for future IB, honors, and AP coursework.

IB MYP Environmental Science

Course Number: 359101R / 359102R
Course Level: Regular
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Environmental Science; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of instructional study including 30 hours of laboratory work)
Teacher Certification Required: Life Science

**COURSE DESCRIPTION**
The International Baccalaureate Middle Years Programme (MYP) is a philosophy of teaching and an approach to instruction. Students in the MYP explore significant content, develop skills, and deepen conceptual understanding through their engagement with global contexts. Teachers will plan using the MYP objectives and assess using the MYP criteria. Environmental Science is a standard introductory course into the scientific study of the mutual relationships between organisms and their environment that is designed for students who are developing their problem-solving and analytic skills. Students taking Environmental Science will regularly experience hands-on, inquiry-based learning opportunities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as interrelations between organisms and the environment, cycles of matter and energy transfers in ecosystems, and natural resources.

In an honors class, students will be expected to engage in more advanced problem solving and extend their learning to science projects outside of the classroom. Successful completion of Environmental Science H will prepare students for future IB, honors, and AP coursework.

### IB MYP Physics

**Course Number:** 363101R / 363102R  
**Course Level:** Regular  
**Prerequisites:** None but require Algebra as co-requisite course  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Physics; Career Ed; Elective  
**Recommended Course Duration:** 2 semesters (120 hours of instructional study including 30 hours of laboratory work)  
**Teacher Certification Required:** Physics

**COURSE DESCRIPTION**
The International Baccalaureate Middle Years Programme (MYP) is a philosophy of teaching and an approach to instruction. Students in the MYP explore significant content, develop skills, and deepen conceptual understanding through their engagement with global contexts. Teachers will plan using the MYP objectives and assess using the MYP criteria. Physics is a standard introductory course into the scientific study of forces, motions, waves and energy that is designed for students who are developing their problem-solving and analytical skills. Students taking Physics will regularly experience hands-on, inquiry-based
learning opportunities. Students will engage in the Science
and Engineering Practices as outlined in A Framework for
K-12 Science Education and the Next Generation Science
Standards to learn about essential Big Ideas such as force
and motion, waves, and interactions of energy and matter.

Honors IB MYP Physics

Course Number: 363101H / 363102H
Course Level: Honors
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters (120 hours of
instructional study including 30 hours of laboratory work).
Teacher Certification Required: Physics

COURSE DESCRIPTION
The International Baccalaureate Middle Years Programme (MYP)
is a philosophy of teaching and an approach to
instruction. Students in the MYP explore significant content,
develop skills, and deepen conceptual understanding
through their engagement with global contexts. Teachers
will plan using the MYP objectives and assess using the
MYP criteria. Physics is a standard introductory course
into the scientific study of forces, motions, waves and
energy that is designed for students who are developing
their problem-solving and analytical skills. Students taking
Physics will regularly experience hands-on, inquiry-based
learning opportunities. Students will engage in the Science
and Engineering Practices as outlined in A Framework for
K-12 Science Education and the Next Generation Science
Standards to learn about essential Big Ideas such as force
and motion, waves, and interactions of energy and matter.

In an honors class, students will be expected to engage in
more advanced problem solving and extend their learning
to science projects outside of the classroom. Successful
completion of Physics H will prepare students for future IB,
honors, and AP coursework.

IB HL Physics I

Course Number: 363101A / 363102A
Course Level: Advanced
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click here for a link with more detailed information
about the course

COURSE DESCRIPTION
The IB physics course allows students to develop practical
skills and techniques and to increase facility in the use
of mathematics. It also allows students to develop
interpersonal skills, and information and communication
technology skills, which are essential in modern scientific
endeavor and are important life-enhancing, transferable
skills. While the skills and activities of IB Physics are
common to students at both SL and HL, students at HL are
required to study some topics in greater depth, to study
additional topics and to study extension material of a more
demanding nature in the common options.

IB HL Physics II

Course Number: 363201A / 363202A
Course Level: Advanced
Prerequisites: IB HL Physics I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Physics; Career Ed; Elective; Additional Lab Science; Biology
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click here for a link with more detailed information
about the course
Course Descriptions

Science

COURSE DESCRIPTION
The IB physics course allows students to develop practical skills and techniques and to increase facility in the use of mathematics. It also allows students to develop interpersonal skills, and information and communication technology skills, which are essential in modern scientific endeavor and are important life-enhancing, transferable skills. While the skills and activities of IB Physics are common to students at both SL and HL, students at HL are required to study some topics in greater depth, to study additional topics and to study extension material of a more demanding nature in the common options.

IB SL Physics I

Course Number: 363301A / 363302A
Course Level: Advanced
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
The IB physics course allows students to develop practical skills and techniques and to increase facility in the use of mathematics. It also allows students to develop interpersonal skills, and information and communication technology skills, which are essential in modern scientific endeavor and are important life-enhancing, transferable skills. While the skills and activities of IB Physics are common to students at both SL and HL, students at HL are required to study some topics in greater depth, to study additional topics and to study extension material of a more demanding nature in the common options.

IB SL Physics II

Course Number: 363401A / 363402A
Course Level: Advanced
Prerequisites: IB SL Physics I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Physics; Career Ed; Elective; Additional Lab Science; Biology
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
The IB physics course allows students to develop practical skills and techniques and to increase facility in the use of mathematics. It also allows students to develop interpersonal skills, and information and communication technology skills, which are essential in modern scientific endeavor and are important life-enhancing, transferable skills. While the skills and activities of IB Physics are common to students at both SL and HL, students at HL are required to study some topics in greater depth, to study additional topics and to study extension material of a more demanding nature in the common options.

Advanced Placement Biology

Course Number: 372101A / 372102A
Course Level: Advanced
Prerequisites: General education Biology and Chemistry
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Biology; Additional Lab Science; Career Ed; Elective
Recommended Course Duration: 2 semesters, should include double lab period
Teacher Certification Required: Biology, AP summer institute

COURSE DESCRIPTION
The redesigned AP biology course challenges the shift from the traditional content model of study to one that focuses on enduring, conceptual understands and the content
that supports them. This will allow students to spend less time on factual recall and more time on inquiry-based learning and essential concepts, and will help them develop reasoning skills necessary in science practices. The key concepts and related content are organized four underlying principles called “Big Ideas”, which encompass the core scientific principles, theories and process governing living organisms and biological systems.

Advanced Placement Biology Extended

Course Number: 372201A / 372202A  
Course Level: Advanced  
Prerequisites: Students must also be enrolled in the AP biology class  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Elective  
Recommended Course Duration: 2 semesters  
Teacher Certification Required: Should be biology major and participated in the five-day summer institute  
COURSE DESCRIPTION:  
Supports student-directed laboratory investigations used throughout the course allowing students to apply the seven science practices that includes at least two lab experiences in each of the four big ideas. AP biology investigative work is integrated throughout the course for a minimum of 25 percent of instructional time.

Dual Credit Bio 114 (.5)  
BIOLOGY 114

Course Number: 336211A / 336212A  
Course Level: Advanced  
Number of Credit Earned: 1.0  
Recommended Course Duration: 2 semesters  
COURSE DESCRIPTION:  
General Education Biology  
A laboratory course emphasizing scientific inquiry through selected concepts of biology, such as organization, function heredity, evolution, and ecology. Biological issues with personal and social implications will be introduced to enable students to make informed decisions. Writing assignments, as appropriate to the discipline, are part of the course. Prerequisite: ACT Reading $\geq 19$ or COMPASS E-write: 8+ and COMPASS Reading: 80-99.

Advanced Placement Physics 1

Course Number: 373501A / 373502A  
Course Level: Advanced  
Prerequisites: Geometry and be concurrently taking Algebra II or an equivalent course.  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Physics; Career Ed; Elective  
Recommended Course Duration: 2 semesters  
Teacher Certification Required: Physics endorsement and five-day summer institute  
COURSE DESCRIPTION:  
AP Physics 1 is an algebra-based, introductory college-level physics course that explores topics such as Newtonian
Science

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mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits. Through inquiry based learning, students will develop scientific critical thinking and reasoning skills.

The course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry based investigations that provide students with opportunities to apply the science practices.

**Advanced Placement Physics 1 Extended**

**Course Number:** 373401A / 373402A  
**Course Level:** Advanced  
**Prerequisites:** Students must also be enrolled in the AP physics 1 class  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Elective  
**Recommended Course Duration:** 2 semesters  
**Teacher Certification Required:** Physics endorsement and five-day summer institute

**Course Description**

AP Physics 1 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. The course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry based investigations that provide students with opportunities to apply the science practices.

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**Advanced Placement Physics 2 Extended**

**Course Number:** 373611A / 373612A  
**Course Level:** Advanced  
**Prerequisites:** Students must also be enrolled in the AP physics 2 class  
**Number of Credits Earned:** 1.0  
**Type of Graduation Credit Earned:** Elective  
**Recommended Course Duration:** 2 semesters  
**Teacher Certification Required:** Physics endorsement and five-day summer institute

**Course Description**

Provides an extension of the classroom time for students to spend a minimum of 25 percent of instructional time engaging in hands-on laboratory work with an emphasis on inquiry-based investigations.
Science

Course Descriptions

Advanced Placement Physics C: Mechanics

Course Number: 373201A / 373202A
Course Level: Advanced
Prerequisites: Algebra, Algebra II and Trigonometry, Geometry, Pre-Calculus if student passed Algebra in 8th grade
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Physics, AP summer institute

COURSE DESCRIPTION
AP Physics C: Mechanics should provide 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; and oscillations and gravitation. This will be a new redesigned course in 2014-15

Advanced Placement Physics C: Electricity and Magnetism

Course Number: 373201A / 373202A
Course Level: Advanced
Prerequisites: Algebra, Algebra II and Trigonometry, Geometry, Pre-Calculus if student passed Algebra in 8th grade
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Physics; Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Physics, AP summer institute

COURSE DESCRIPTION
AP Physics C: Electricity and Magnetism will receive instruction in each of the following five content areas: electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. This will be a new redesigned course in 2014-15

Advanced Placement Physics C Extended

Course Number: 373211A / 373212A
Course Level: Advanced
Prerequisites: Students must also be enrolled in the AP physics C class
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Physics endorsement and five-day summer institute

COURSE DESCRIPTION
Supports the extension of instructional time and provides opportunities for students to apply knowledge of physics’ principles and allows for the full development of quantitative problem-solving skills.

Advanced Placement Chemistry

Course Number: 374101A / 374102A
Course Level: Advanced
Prerequisites: General education Chemistry
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Chemistry; Additional Lab Science; Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Chemistry, AP summer institute

COURSE DESCRIPTION
The key concepts and related content that define the course and exam are organized around a few underlying principles called the big ideas, which encompass the core scientific principles, theories, and processes governing chemical systems. For each of the six big ideas, enduring understandings, which incorporate the core concepts that students should retain from the learning experiences are also identified. The course is designed with this curriculum
framework as its foundation, it will also develop advanced inquiry and reasoning skills, such as designing a plan for collecting data, analyzing data, applying mathematical routines, and connecting concepts in and across domains.

Advanced Placement Chemistry Extended

Course Number: 374201A / 374202A  
Course Level: Advanced  
Prerequisites: Students must be enrolled in the AP chemistry class  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Elective  
Recommended Course Duration: 2 semesters  
Teacher Certification Required: Chemistry major with education certification and AP summer institute before teaching the course

COURSE DESCRIPTION
Supports a student-directed, inquiry-based lab experience that provides opportunities for student to design experiments, collect data, apply mathematical routines and methods, and refine testable explanations and predictions. A minimum of 25 percent of instructional time should be devoted to lab investigations to conduct at least 16 hands-on laboratory investigations.

IB HL Chemistry II

Course Number: 375201A / 375202A  
Course Level: Advanced  
Prerequisites: IB HL Chemistry I  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Chemistry; Career Ed; Elective; Additional Lab Science; Biology  
Recommended Course Duration: 2 semesters  
Teacher Certification Required: Science  
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
The chemistry course is organized by topics, with SL students having to study eleven topics and higher level (HL) students having to investigate nine of these topics to a greater depth. Both SL and HL students are responsible for covering two of seven option topics. An experimental approach to the course delivery is emphasized.

External assessment consists of three written papers and provides opportunities for students to display their scientific understanding through the application, use, analysis and evaluation of scientific facts, concepts, methods, techniques and explanations.
Science

Course Descriptions

IB SL Chemistry I

Course Number: 375301A / 375302A
Course Level: Advanced
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Chemistry; Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click [here](#) for a link with more detailed information about the course

COURSE DESCRIPTION

The chemistry course is organized by topics, with SL students having to study eleven topics and higher level (HL) students having to investigate nine of these topics to a greater depth. Both SL and HL students are responsible for covering two of seven option topics. An experimental approach to the course delivery is emphasized.

External assessment consists of three written papers and provides opportunities for students to display their scientific understanding through the application, use, analysis and evaluation of scientific facts, concepts, methods, techniques and explanations.

IB SL Chemistry II

Course Number: 375401A / 375402A
Course Level: Advanced
Prerequisites: IB SL Chemistry I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Chemistry; Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click [here](#) for a link with more detailed information about the course

Advanced Placement Environmental Science

Course Number: 376101A / 376102A
Course Level: Advanced
Prerequisites: Environmental Science; Career Ed; Elective
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Other Lab Science; Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: General Science, AP summer institute

COURSE DESCRIPTION

The AP Environmental Science course is designed to be the equivalent of a one semester, introductory college course in environmental science. The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them.

Advanced Placement Environmental Science Extended

Course Number: 376201A / 376202A
**Science**

**Course Descriptions**

**Course Level:** Advanced

**Prerequisites:** Students must also be enrolled in the AP Environmental Science class.

**Number of Credits Earned:** 1.0

**Type of Graduation Credit Earned:** Elective

**Recommended Course Duration:** 2 semesters

**Teacher Certification Required:** General science education major with certification and AP summer institute before teaching the course

**COURSE DESCRIPTION**

Supports the extension of instructional time but most importantly it allows time for student to participate in laboratory and field work. It is expected that students will complete as many lab and field experiences as required to complete the lab and field components of the course.

**IB SL Sports exercise and health science I**

**Course Number:** 378101A / 378102A

**Course Level:** Advanced

**Prerequisites:** None

**Number of Credits Earned:** 1.0

**Type of Graduation Credit Earned:** Career Ed; Elective; Biology

**Recommended Course Duration:** 2 semesters

**Teacher Certification Required:** Science

**Links:** Click [here](#) for a link with more detailed information about the course

**COURSE DESCRIPTION**

This course incorporates the disciplines of anatomy and physiology, biomechanics, psychology and nutrition, which are studied in the context of sport, exercise and health. A combination of syllabus content and experimental work provides the opportunity for students to acquire the knowledge and understanding necessary to apply scientific principles and analyze human performance. The course has strong international dimensions such as international sporting competition and the international bodies that regulate them. Ethical issues that exist within sporting competitions are considered. The comprehensive curriculum provides excellent preparation for university courses including those specifically related to Sport, Sports Science or Physical Education.

**IB SL Sports exercise and health science II**

**Course Number:** 378201A / 378202A

**Course Level:** Advanced

**Prerequisites:** IB SL Sports exercise and health science I

**Number of Credits Earned:** 1.0

**Type of Graduation Credit Earned:** Additional Lab Science; Career Ed; Elective

**Recommended Course Duration:** 2 semesters

**Teacher Certification Required:** Science

**Links:** Click [here](#) for a link with more detailed information about the course

**COURSE DESCRIPTION**

This course incorporates the disciplines of anatomy and physiology, biomechanics, psychology and nutrition, which are studied in the context of sport, exercise and health. A combination of syllabus content and experimental work provides the opportunity for students to acquire the knowledge and understanding necessary to apply scientific principles and analyze human performance. The course has strong international dimensions such as international sporting competition and the international bodies that regulate them. Ethical issues that exist within sporting competitions are considered. The comprehensive curriculum provides excellent preparation for university courses including those specifically related to Sport, Sports Science or Physical Education.

**IB SL Env Systems I**

**Course Number:** 379201A / 379202A

**Course Level:** Advanced

**Prerequisites:** None

**Number of Credits Earned:** 1.0
COURSE DESCRIPTION
Through studying environmental systems and societies (ES&S) students will be provided with a coherent perspective of the interrelationships between environmental systems and societies; one that enables them to adopt an informed personal response to the wide range of pressing environmental issues that they will inevitably come to face. The teaching approach is such that students are allowed to evaluate the scientific, ethical and socio-political aspects of issues. During the course, students will study seven different topics. The most important aspect of the ES&S course is hands-on work in the laboratory and/or out in the field.

IB SL Design Technology I

Course Number: 380101A / 380102A
Course Level: Advanced
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
The design technology course is organized by topics, SL students study seven topics and HL students study a further five, with some of these taking the first seven topics to greater depth. In addition to this, students study one out of a choice of five options, including Food science and technology, Electronic product design, CAD/CAM, Textiles, and Human factors design. Diploma Programme design technology is based on a model of learning that incorporates knowledge, skills and design principles in problem-solving contexts, while at the same time maximizing the use of local and readily available resources.

IB SL Design Technology II

Course Number: 380201A / 380202A
Course Level: Advanced
Prerequisites: IB SL Design Technology I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective; Additional Lab Science

Links: Click here for a link with more detailed information about the course

COURSES

Environmental Science and Society

Recommended Course Duration: 2 semesters
Teacher Certification Required: Science or Social Science

Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
Through studying environmental systems and societies (ES&S) students will be provided with a coherent perspective of the interrelationships between environmental systems and societies; one that enables them to adopt an informed personal response to the wide range of pressing environmental issues that they will inevitably come to face. The teaching approach is such that students are allowed to evaluate the scientific, ethical and socio-political aspects of issues. During the course, students will study seven different topics. The most important aspect of the ES&S course is hands-on work in the laboratory and/or out in the field.
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click [here](#) for a link with more detailed information about the course

COURSE DESCRIPTION
The design technology course is organized by topics, SL students study seven topics and HL students study a further five, with some of these taking the first seven topics to greater depth. In addition to this, students study one out of a choice of five options, including Food science and technology, Electronic product design, CAD/CAM, Textiles, and Human factors design. Diploma Programme design technology is based on a model of learning that incorporates knowledge, skills and design principles in problem-solving contexts, while at the same time maximizing the use of local and readily available resources.

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**IB HL Design Technology I**

Course Number: 380301A / 380302A
Course Level: Advanced
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click [here](#) for a link with more detailed information about the course

COURSE DESCRIPTION
The design technology course is organized by topics, SL students study seven topics and HL students study a further five, with some of these taking the first seven topics to greater depth. In addition to this, students study one out of a choice of five options, including Food science and technology, Electronic product design, CAD/CAM, Textiles, and Human factors design. Diploma Programme design technology is based on a model of learning that incorporates knowledge, skills and design principles in problem-solving contexts, while at the same time maximizing the use of local and readily available resources.

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**IB HL Design Technology II**

Course Number: 380401A / 380402A
Course Level: Advanced
Prerequisites: IB HL Design Technology I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective; Additional Lab Science
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science
Links: Click [here](#) for a link with more detailed information about the course

COURSE DESCRIPTION
The design technology course is organized by topics, SL students study seven topics and HL students study a further five, with some of these taking the first seven topics to greater depth. In addition to this, students study one out of a choice of five options, including Food science and technology, Electronic product design, CAD/CAM, Textiles, and Human factors design. Diploma Programme design technology is based on a model of learning that incorporates knowledge, skills and design principles in problem-solving contexts, while at the same time maximizing the use of local and readily available resources.

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**Honors Northwestern Scholars Summer Science I**

Course Number: 304301H / 304302H
Course Level: Honors
Prerequisites: None
Number of Credits Earned: 0.5
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 1 semester
Teacher Certification Required: Science
COURSE DESCRIPTION

Students will gain exposure to topics related to the GI system and surgical principles. Students will also develop a set of conceptual tools that they can use to make judgments about the challenges and opportunities that health care professionals will encounter in the near future. In addition, students will be provided with resources about how to reduce health disparities and how to overcome some of the common obstacles that communities have in gaining access to care.

Honors IB MYP Scientific Inquiry and Design

Course Number: 398401H / 398402H
Course Level: Honors
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semester
Teacher Certification Required: Science

COURSE DESCRIPTION

IB MYP Scientific Inquiry and Design is an elective course designed to support MYP students with developing proficiency with key scientific practices and content as they are transitioning from middle to high school. Students will understand and apply science and math in meaningful and productive ways through hands-on and minds-on learning experiences. Students will independently and collaboratively observe, explore, and question the world around them with a scientific lens. This course explores, both conceptually and quantitatively, fundamental concepts of nature including known mathematical relationships, physical laws, and environmental cycles and systems. This course supports students in the development of an enduring understanding of the relationship between scientific discovery, technological innovations, and engineering solutions.

Honors Science Fitness and Wellness

Course Number: 324101H / 324102H
Course Level: Honors
Prerequisites: Biology
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semester
Teacher Certification Required: Biology

COURSE DESCRIPTION

Honors Science Fitness and Wellness is an introductory course where students develop an understanding of the physiological mechanisms underlying human movement. Specific topics of study include muscle physiology, cardiac function, circulation, energy metabolism, and gas exchange. Coursework includes laboratory exercises, community fitness and wellness activities. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as matter and energy in organisms, chemical reactions, and force and motion.

Honors Aquaponics I

Course Number: 338101H / 338102H
Course Level: Honors
Prerequisites: Biology, Chemistry
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semester
Teacher Certification Required: Biology

COURSE DESCRIPTION

Note: New applications for this course are not being accepted at this time.

Honors Aquaponics is an applied science course where students examine the science and techniques underlying integrated plant and fish cultivation. The course involves student research projects related to aquaponics system design and maintenance, plant biology, fish biology, agriculture and sustainable farming practices, soil and water quality, and plant propagation. Students will investigate these processes through laboratory sessions.
Science

Course Descriptions

in the Aquaponics Lab and the Garden. The aquaponics program is designed to emphasize the theory and application of horticultural and agriscience techniques as well as the practical applications of science to improving everyday life. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as interrelations between organisms and the environment, cycles of matter and energy transfers in ecosystems, natural resources, and matter and energy in organisms.

Honors Aquaponics II

Course Number: 338201H / 338202H
Course Level: Honors
Prerequisites: Biology, Chemistry, Honors Aquaponics I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semester
Teacher Certification Required:

COURSE DESCRIPTION
Note: New applications for this course are not being accepted at this time.

Aquaponics is an applied science that centers around integrated plant and fish cultivation. Students who have completed Aquaponics I, may take this advanced level course which requires students to conduct individual research about the following topics: aquaponics system design and maintenance, plant biology, fish biology, sustainable agriculture, soil and water quality, and plant propagation. Students will investigate these topics through designing and conducting independent investigations. Students will communicate their results in the form of research papers and posters. This course emphasizes individual scientific research, as well as the theory and application of horticulture and agriscience techniques. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential Big Ideas such as interrelations between organisms and the environment, cycles of matter and energy transfers in ecosystems, natural resources, and matter and energy in organisms.

Honors STEM Research

Course Number: 399201H / 399202H
Course Level: Honors
Prerequisites: Biology, Physics
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semester
Teacher Certification Required: Science Certification

COURSE DESCRIPTION
Honors STEM Research provides students with an opportunity to engage in real-world science investigations and hands-on engineering design and problem-solving. Students will design and conduct investigations to discover how remote sensing platforms such as scientific balloons are used to gather data from the depths of the ocean to the stratosphere. Students will conduct several research investigations and present them in a variety of ways. In addition, students will use engineering principles while working collaboratively to design and build devices to meet given specifications.

Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards in order to learn about the disciplinary core ideas including Earth’s systems and Energy.

FUSE: STEM Design and Exploration

Course Number: 399401R / 399402R
Course Level: Regular
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semester
Teacher Certification Required: Science Certification

COURSE DESCRIPTION
FUSE is a science elective class designed for students to explore the areas of and connections between science, technology, engineering and mathematics while developing problem-solving and analytic skills. Students taking
FUSE will engage in hands-on, inquiry-based learning opportunities to explore four key themes (scale, energy, cause and effect, and structure) through a series of self-selected and self-paced activities called FUSE Challenges. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to explore and make connections between the Disciplinary Core Ideas.

Honors Astrochemistry

Course Number: 334401H / 334402H
Course Level: Honors
Prerequisites: Chemistry, Physics
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semester
Teacher Certification Required: Chemistry

COURSE DESCRIPTION
Astrochemistry is an interdisciplinary field of science that incorporates chemical, biological, geological, planetary, stellar, and cosmic phenomena. Honors Astrochemistry is an inquiry-driven course where students will explore and understand the role of chemical processes in the universe, inside stars, and on planets. Coursework includes laboratory simulations, analysis of scientific texts, and research projects. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards in order to learn about the disciplinary core ideas including the Earth’s systems, Energy, and Earth’s place in the Universe.

Honors Microbiology

Course Number: 392101H / 392102H
Course Level: Honors
Prerequisites: Biology, Chemistry
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semester

COURSE DESCRIPTION
Microbiology is the study of the structure and biology of microscopic organisms with an emphasis on the role of microorganisms in human disease. In Honors Microbiology, students will research how diseases impact human systems. Topics included are the study of the immune system, vaccines, parasites, population dynamics and the evolution of disease causing organisms. Students will engage in the Science and Engineering Practices as outlined in the Next Generation Science Standards to explore disciplinary core ideas of life sciences such as structure and function, ecosystem dynamics, and biological evolution.

Honors Nanoscience & Nanotechnology

Course Number: 301101H / 301102H
Course Level: Honors
Prerequisites: Physics and Chemistry
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semester
Teacher Certification Required: Physics endorsement

COURSE DESCRIPTION
Nanoscience & Technology is a course which provides entry-level as well as advanced training in nanotechnology skills, methods and applications. The first half of this course focuses on nanoscience, with an emphasis on nano found in the natural world, scientific methods used to study nano, and methods to build nano in the lab. The second half of this course focuses on nanotechnology, with an emphasis on careers, commercialization of nanotechnology, and bio-mimicry. The laboratory-based class integrates the core competencies of the physical sciences career pathway and life sciences with the technical skills needed for postsecondary education and/or employment in the science and technology industry. Students will be able to identify nanoscience and technology and explain the methods and techniques used in nanoscience and nanotechnology.
Science

Course Descriptions

Honors Neuroscience

Course Number: 361101H / 361102H  
Course Level: Honors  
Prerequisites: Biology, Chemistry  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Career Ed; Elective  
Recommended Course Duration: 2 semester  
Teacher Certification Required: Biology

COURSE DESCRIPTION
Neuroscience is the study of the development, organization and function of the nervous system. In Honors Neuroscience, students will investigate the mammalian nervous system, with emphasis on the structure and function of the human brain. Course topics include the function of neurons and sensory systems, the processes of learning and memory, and diseases of the brain. Students will also explore current research into mental illness and degenerative diseases, plasticity and repair of the nervous system, and technologies such as stem cell research and genetic engineering. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential big ideas such as biological structures and processes and growth and development of organisms.

Human Body Systems

Course Number: 393201R / 393202R  
Course Level: Regular  
Prerequisites:  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Career Ed; Elective  
Recommended Course Duration: 2 semester  
Teacher Certification Required: Biology

COURSE DESCRIPTION
Human Body Systems is a science elective course where students will engage in science practices in order to understand the structures and processes of the human body. Topics include homeostasis, the role of body systems in the transfer of matter and energy, and reproduction from cells to organisms. Students will explore the nature of science by conducting research projects about bioethics, health and current science events. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards to learn about essential big ideas such as biological structures and processes and growth and development of organisms.

Honors Horticulture

Course Number: 652101H / 652102H  
Course Level: Honors  
Prerequisites: Biology, Chemistry  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Career Ed; Elective  
Recommended Course Duration: 2 semester  
Teacher Certification Required: Biology

COURSE DESCRIPTION
Honors Horticulture is an elective course that allows students to understand the disciplinary core ideas of life science and engineering through the lens of plants. Students will plan and carry out investigations, design solutions, and construct and use models as they explore the science of growing and improving the growth of plants. Topics include plant growth and development, the structure and function of plant parts, the formation and composition of soil, and plant-environment interactions. Students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards as they explore crosscutting concepts and core ideas connected to plants.

Honors Meteorology

Course Number: 371101H / 371102H  
Course Level: Honors  
Prerequisites: Enrolled or passed physics  
Number of Credits Earned: 1.0  
Type of Graduation Credit Earned: Career Ed; Elective
Course Descriptions

Science

Recommended Course Duration: 2 semester
Teacher Certification Required: Earth Space Science

COURSE DESCRIPTION
Honors Meteorology in an elective course that introduces atmospheric phenomena in real-time through the use of meteorological tools including forecasting models, climate models, simulations, and weather maps. Students will investigate meteorological and climate based data related to the current and future state of the atmosphere and apply basic mathematical models to explain real-world phenomenon. Map discussions, forecasting logs, module training, lab/project activities, and data collecting/extrapolation will drive student learning. In this course, students will engage in the Science and Engineering Practices as outlined in A Framework for K-12 Science Education and the Next Generation Science Standards in order to explore the disciplinary core ideas of Earth’s Systems and Earth and Human Activity.

IB HL Computer Science I

Course Number: 778101A / 778102A
Course Level: Advanced
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science or Math
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
Computer science is regarded as an experimental science. The IB computer science course is a rigorous and practical problem-solving discipline. Features and benefits of the curriculum and assessment include the following: Computational thinking lies at the heart of the course and is integrated with other topics, which is supported by practical activities including programming; Practical programming experience is an essential element of developing higher-level thinking skills; which may be assessed as a part of the internal assessment; Four course options are available; databases, modeling and simulation, web science, and object oriented programming.

IB HL Computer Science II

Course Number: 778201A / 778202A
Course Level: Advanced
Prerequisites: IB HL Computer Science I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science or Math
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
Computer science is regarded as an experimental science. The IB computer science course is a rigorous and practical problem-solving discipline. Features and benefits of the curriculum and assessment include the following: Computational thinking lies at the heart of the course and is integrated with other topics, which is supported by practical activities including programming; Practical programming experience is an essential element of developing higher-level thinking skills; which may be assessed as a part of the internal assessment; Four course options are available; databases, modeling and simulation, web science, and object oriented programming.

IB SL Computer Science I

Course Number: 778401A / 778402A
Course Level: Advanced
Prerequisites: None
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science or Math
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
Computer science is regarded as an experimental science. The IB computer science course is a rigorous and practical problem-solving discipline. Features and benefits of the curriculum and assessment include the following: Computational thinking lies at the heart of the course and is integrated with other topics, which is supported by practical activities including programming; Practical programming experience is an essential element of developing higher-level thinking skills; which may be assessed as a part of the internal assessment; Four course options are available; databases, modeling and simulation, web science, and object oriented programming.
problem-solving discipline. Features and benefits of the curriculum and assessment include the following: Computational thinking lies at the heart of the course and is integrated with other topics, which is supported by practical activities including programming; Practical programming experience is an essential element of developing higher-level thinking skills; which may be assessed as a part of the internal assessment; Four course options are available; databases, modeling and simulation, web science, and object oriented programming.

IB SL Computer Science II

Course Number: 778501A / 778502A
Course Level: Advanced
Prerequisites: IB SL Computer Science I
Number of Credits Earned: 1.0
Type of Graduation Credit Earned: Career Ed; Elective
Recommended Course Duration: 2 semesters
Teacher Certification Required: Science or Math
Links: Click here for a link with more detailed information about the course

COURSE DESCRIPTION
Computer science is regarded as an experimental science. The IB computer science course is a rigorous and practical problem-solving discipline. Features and benefits of the curriculum and assessment include the following: Computational thinking lies at the heart of the course and is integrated with other topics, which is supported by practical activities including programming; Practical programming experience is an essential element of developing higher-level thinking skills; which may be assessed as a part of the internal assessment; Four course options are available; databases, modeling and simulation, web science, and object oriented programming.

Integrated Science for Newcomers

Course Number: 300101R/ 300102R
Course Level: Regular
Prerequisites: N/A
Number of Credits Earned: 1.0

Type of Graduation Credit Earned: Elective
Recommended Course Duration: N/A
Teacher Certification Required: N/A

COURSE DESCRIPTION
Integrated Science for Newcomers cannot be scheduled at a school. The course is to be entered directly on to a student’s transcript when the student transfers from a foreign county, and the Science course the student took is not a Science course in CPS's district curriculum file. Before entering a transcript from a foreign country into IMPACT SIM contact Beata Arceo at barceo@cps.edu or 773-553-1936 for the evaluation of the foreign transcript.