

Science Graduation Requirements

Class of 2006 needs 31 credits

Class of 2008 needs 29 credits

Class of 2007 needs 30 credits

Class of 2009 needs 28 credits

2 Science Credits

Life Science A/B or Biology A/B - Earth Science or Honors Earth Science - One Science Elective

1704 **Life Science 1A**

Life Science 1A is one choice for the first required science class. This class is for students who have trouble in science. This class will include cells, classification and taxonomy, and genetics.

In Life Science 1A, students will:

- Create and design cells models.
- Create and design 3-D models of the DNA structure.
- Classify organisms by using dichotomous keys.

Accreditation Target Goal Components

Writing: Students will write short answers and essay questions about Life Science subjects.

Data Analysis: Data will be analyzed and reported in lab investigations.

Technology: Lab reports should be completed on computer.

Post Secondary Options: Careers are investigated at the end of each unit.

1705 **Life Science 1B**

Life Science 1B is a continuation of Life Science 1A. This class will include evolution, ecology, and the study of human disease.

In Life Science 1B, students will:

- Generate physical relationships between different species of organisms.
- Compare and contrast characteristics of organisms that cause human disease.
- Analyze relationships between organisms.

Accreditation Target Goal Components

Writing: Students will write short answers and essay questions about Life Science subjects.

Data Analysis: Data will be analyzed and reported in lab investigations.

Technology: Lab reports should be completed on computer.

Post Secondary Options: Careers are investigated at the end of each unit.

1708

Biology 1A

Biology 1A is one choice for the first required science class. This class will include cells, classification and taxonomy, and genetics.

In Biology 1A, students will:

- Create and design advanced cell models.
- Design 3-D models of the DNA structure.
- Use the library to complete a scientific research paper.
- Classify organisms using dichotomous keys.

Accreditation Target Goal Components

Writing: Students will keep daily journals of class activities and be responsible for a research paper.

Data Analysis: Data will be analyzed and reported in lab investigations.

Technology: The computer and internet will be used for research. New lab techniques and tools will be used throughout the course.

Post Secondary Options: A variety of biological careers will be explored, along with a research paper on a selected career.

1709

Biology 1B

Biology 1B is a continuation of Biology 1A. This class will include evolution, ecology, and human disease.

In Biology 1B, students will:

- Use the library to complete a scientific research paper.
- Generate physical relationships between different species of organisms.
- Compare and contrast characteristics of organisms that cause human disease.
- Analyze relationships between organisms.

Accreditation Target Goal Components

Writing: Students will keep daily journals of class activities and be responsible for a research paper.

Data Analysis: Data will be analyzed and reported in lab investigations.

Technology: The computer and internet will be used for research. New lab techniques and tools will be used throughout the course.

Post Secondary Options: A variety of biological careers will be explored, along with a research paper on a selected career.

1720

Physical Science 1A (10) –PR: Algebra I Pre-chemistry objectives.

This class can substitute for the required Principles of Technology 1 A class.

This class is developed to give an understanding of the basic concepts in chemistry and help students to recognize and appreciate the order of nature. The periodic law, compound composition, and balancing chemical equations will all be covered.

In this class the student will:

- Gather and synthesize information from books and other sources of information.
- Describe, compare, and contrast changes in atoms and /or molecules during physical and chemical changes.
- Demonstrate the ability to set up, conduct draw conclusions and write up physical science experiments.

Accreditation Target goal components

Writing: Students will have several Type 1 and 2 writing assignments. The topic will be related to science.

Data Analysis: Many graphs and data tables will be used and interpreted in processing information.

Technology: The Internet will be used in researching debate topics.

Post secondary options: Many careers that use physical science will be highlighted throughout the semester.

1721 Physical Science 1B (10) –PR: Algebra I Pre-physics objectives.
This class can substitute for the required Principles of Technology 1 B class.
This class is developed to give an understanding of the basic concepts in physics and help students to recognize and appreciate the order of nature. Motion and energy, wave properties, electricity, and magnetism will all be covered.

In this class the student will:

- Gather and synthesize information from books and other sources of information.
- Describe, compare, and contrast changes in atoms and /or molecules during physical and chemical changes.
- Demonstrate the ability to set up, conduct draw conclusions and write up physical science experiments.

Accreditation Target goal components:

Writing: Students will have several Type 1 and 2 two writing assignments. The topic will be related to science.

Data Analysis: Many graphs and data tables will be used and interpreted in processing information.

Technology: The Internet will be used in researching debate topics.

Post secondary options: Many careers that use physical science will be highlighted throughout the semester.

1724 Earth Science – 11 One Trimester

A required science class that will include the study of Astronomy, Meteorology, and the Geosphere.

In Earth Science, the student will

- Complete a project comparing our Sun to other stars.
- Complete and present a weather report.
- Research scientific materials in the library.
- Create a project based on natural disasters.
- Develop an investigation showing the impact of human beings on the Great Lakes.

Accreditation Target Goal Components

Writing: Students will investigate and write two short papers related to earth science topics

Data Analysis: Data will be analyzed and reported in lab investigations.

Technology: The computer and internet will be used as a required reference for research

Post Secondary Options: A variety of careers will

1725 Honors Earth Science—One Trimester - PR = grade of B+ in Biology A/B and Physical Science A/B

A science class that will include the study of Astronomy, Meteorology, and the Geosphere. This class can substitute for 1724 Earth Science.

In Honors Earth Science, the student will...

- Complete a project comparing our Sun to other stars.
- Complete and present a weather report.
- Research scientific materials in the library.
- Create a project based on natural disasters.
- Develop an investigation showing the impact of human beings on the Great Lakes.

Accreditation Target Goal Components

Writing: Students will investigate and write two short papers related to earth science topics

Data Analysis: Data will be analyzed and reported in lab investigations.

Technology: The computer and internet will be used as a required reference for research

Post Secondary Options: A variety of careers will be explored throughout the course.

1728 Chemistry 1A (11-12) PR: Physical Science, Principles of Technology with teacher permission.

The science dealing with the structure and composition of materials and the changes in composition of these materials. Arrangement of electrons in atoms, the periodic law, chemical bonding, chemical equations, reactions, and stoichiometry will all be covered.

In this class the student will:

- Gather and synthesize information from books and other sources of information.
- Describe, compare, and contrast changes in atoms and/or molecules during physical and chemical changes.
- Demonstrate the ability to set up, conduct, draw conclusions, and write up chemistry experiments.

Accreditation Target Goal Components

Writing: Students will have several Type 1 and 2 writing assignments. The assignments will be related to science.

Technology: The Internet will be used in researching debate topics.

Post secondary options: Many careers that use chemistry will be highlighted throughout the semester.

1729 Chemistry 1B (11-12) PR: Chemistry 1 A

The science dealing with the phases of matter. Physical characteristics of gases, liquids and solids, will be covered. Other solutions, acids and bases, titration and PH, and hydrocarbons.

In this class the student will:

- Gather and synthesize information from books and other sources of information.
- Describe, compare, and contrast changes in atoms and/or molecules during physical and chemical changes.
- Demonstrate the ability to set up, conduct, draw conclusions, and write up chemistry experiments.

Accreditation Target Goal Components

Writing: Students have several Type 1 and 2 writing assignments. The topic will be related to science.

Technology: The Internet will be used in researching debate topics.

Post secondary options: Many careers that use chemistry will be highlighted throughout the semester.

1732 Anatomy And Physiology (11-12) PR = B+ in Biology A/B

An elective science class offered to 11th or 12th grade students with a B+ average in Biology 1A and 1B. Topics of study will include cells, tissues, organs, and organ systems of the human body.

In Anatomy and Physiology, The student will...

- Explore the form and function of specific organ systems of humans.
- Complete dissections or virtual dissections of various organs.
- Analyze scientific documents various lab reports.

Accreditation Target Goal Components:

Writing: Students will complete a large research paper on selected topics.

Data Analysis: Data will be manipulated in lab techniques and studies. Graphs will be compiled in labs.

Technology: Virtual dissections will be used in class along with other internet based activities.

Post Secondary Options: Various medical and science careers will be discussed.

1736 Advanced Biology (11-12) PR = B+ in Biology A/B

An elective science class offered to 11th or 12th grade students with a B+ average in Biology 1A and 1B. Topics of study will include genetics, forensic science, taxonomy, and evolution.

In Advanced Biology, the Student will...

- Analyze an imaginary crime scene for evidence.
- Explain and interpret modern laboratory techniques.
- Research and report on recent biological developments.
- Classify and design organism collection.

Accreditation Target Goal Components

Writing: Students will keep daily journals and be responsible for a large term paper

Data Analysis: Stem-and-leaf and Box-and-Whiskers plots are used to analyze test data, and line graph analysis is done is electrophoresis.

Technology: Video-Flex camera is used to display images. Electrophoresis and other science technology will be implemented.

Post Secondary Options: A variety of biological careers will be explored.

1740 Michigan Natural Resources (11-12)

An elective science class offered to 11th and 12th grade students. Topics of study will include natural resources.

IN NATURAL RESOURCES, THE STUDENT WILL...

- Plan and design a management system.
- Problem solve ways to control invasive species in Michigan.
- Develop strategies for alternative energy sources.

Accreditation Target Goal Components:

Writing: Students will write at least one paper related to career opportunities in Natural Resources.

Data Analysis: Analyze populations of various species.

Technology: Lab reports will be computer generated.

Post Secondary Options: DNR and other Natural Resource careers will be studied.

1744 Geology (11-12)

This is a 11th and 12th grade elective class that will examine the earth, its form and composition, and the changes it has undergone.

In Geology, the Students will:

- Identify rocks and minerals based on physical and chemical characteristics.
- Learn about gemstones and how they are made.
- Explore Michigan geology.
- Complete hands on activities in lapidary fields.

Accreditation Target Goal Components:

Writing: Students will complete lab reports and descriptive writing assignments throughout the course.

Data Analysis: Data will be analyzed and reported in lab investigations.

Technology: Students will use CD's to explore information. They will use equipment to complete labs.

Post Secondary Options: Careers pertaining to topic areas will be addressed in classroom discussions.

1754 **Physics 1A (12) PR: Physical Science.**

Physics is concerned primarily with the study of matter and energy. It seeks to explain the behavior and interrelationships of matter and energy in the universe. Course topics that will be discussed are motion, vectors, and laws of motion, work, and energy.

In this class the student will:

- Gather and synthesize information from books and other sources of information.
- Describe, compare, and contrast the notion of objects using Newton's three laws of motion.
- Demonstrate the ability to set up, conduct, draw conclusions and write up physics experiments.

Accreditation Target Goal Components
Writing: Students will have several Type 1 and 2 writing assignments. The topic will be related to science.
Data Analysis: Many graphs and data tables will be used and interpreted in processing information.
Technology: The Internet will be used in researching debate topics
Post secondary options: Many careers that use physics will be highlighted throughout the semester.

1755 **Physics 1B (12) PR: Physical Science and Physics 1 A**

Course topics that will be discussed are momentum and collisions, heat, thermal conduction, electrical energy, current and resistance, circuit and light (Reflection, refraction, and diffraction).

In this class the student will:

- Gather and synthesize information from books and other sources of information.
- Describe, compare, and contrast the notion of objects using Newton's three laws of motion.
- Demonstrate the ability to set up, conduct, draw conclusions and write up physics experiments.

Accreditation Target Goal Components
Writing: Students will have several Type 1 and 2 writing assignments. The topic will be related to science.
Data Analysis: Many graphs and data tables will be used and interpreted in processing information.
Technology: The Internet will be used in researching debate topics
Post secondary options: Many careers that use physics will be highlighted throughout the semester.