

## SCIENCE

- Course descriptions that are shaded are not being offered this school year.
- Students are required to earn 3 credits of science in the following areas:
  - Required courses – 2 credits – Students must complete all four courses listed below
    - Biology A – ½ credit
    - Chemistry A – ½ credit
    - Earth Science A – ½ credit
    - Physics A – ½ credit
  - Elective courses – 1 credit – Students must complete two of the courses listed below
    - Biology B – ½ credit
    - Chemistry B – ½ credit
    - Earth Science B – ½ credit
    - Physics B – ½ credit
  - Additional Information
    - Students who enroll in and successfully complete 1 credit in a Career and Technical Education (CTE) course can use that credit to fulfill the elective Science credit.
    - Students who enroll in and successfully complete AP Biology, AP Chemistry, or AP Physics can use those credits to fulfill the elective Science credit.
- AP Biology, AP Chemistry, AP Physics, Chemistry, Physics, and STEM courses may be able to count as math-related courses as long as they are taken in the student’s senior year and are not counted as Science credits.

### Advanced Forensic Science

1 trimester

Grade Level: 11-12

Course # 2407

Prerequisite: Forensic Science A & B

Advanced Forensic Science will cover units that exceed the content taught in Forensic Science A & B. Units of study will include: Hair and Fibers, Document Analysis, DNA Analysis, Genetic Genealogy, Criminal Psychology, Ballistics, and Impression Evidence.

**\*\*Pending Board of Education Approval\*\***

### Agri-Science Leadership

1 trimester

Grade Level: 9 – 12

Course # 2601

Prerequisite: None

This course is intended for those students directly involved in the FFA as an officer, as a committee chairperson, or for students who plan to participate in a leadership or ag skills contest. Basic information regarding parliamentary procedure, organizational management, and prepared public speaking will be taught.

### Anatomy/Physiology

2 trimesters

Grade Level: 10 – 12

Course # 2401

Prerequisites: C+ or better in

#2402

Biology

This course is designed to assist students in building a better understanding of how the human body performs. This course is most helpful for students interested in the medical field. Anatomy and Physiology will assist students in developing knowledge required to pursue a career in nursing, human medicine, veterinary medicine or biotechnology. Laboratory techniques are emphasized, including numerous dissections.

**AP Biology**Course # 2507  
#2508  
#2509

3 trimesters

Grade Level: 10 - 12

Prerequisites: Successful completion of Biology A and Chemistry A is encouraged.

The AP Biology course is designed to be the equivalent of a college introductory biology course. It will enrich the student's knowledge of biology and help students develop laboratory skills and techniques. It is based on the national Advanced Placement Program and students will be prepared to take the Advanced Placement test in. In this course Four big ideas will be covered:

- The process of evolution drives the diversity and unity of life.
- Biological systems utilize free energy and molecular building blocks to grow, reproduce, and maintain dynamic homeostasis.
- Living systems store, retrieve, transmit, and respond to information essential to life processes.
- Biological systems interact, and these systems and their interactions possess complex properties.

There will also be a focus on the following science practices: concept explanation, visual representations, questions and methods, representing and describing data, statistical tests and data analysis, and argumentation. All laboratory work will focus on science as a process and will be student-directed and inquiry based. A summer assignment is a requirement of the course. Students will be asked to complete this assignment during the month of August.

**AP Chemistry**Course # 2501  
#2502  
  
#2503

3 trimesters

Grade Level: 10 - 12

Prerequisites: Successful completion of Chemistry A and should be through or enrolled in Algebra II

Advanced Placement Chemistry is a college level course for those interested in pursuing a career in the sciences. This class will be taught at a level equivalent to a first year college chemistry course. This is a rigorous course that will cover the four big ideas that have been outlined by the AP College Board

- **Scale, proportion, and quantity**
- **Structure and properties**
- **Transformations**
- **Energy**

Laboratory work is a necessary and vital component of this class and will be conducted weekly. In the laboratory setting students will be asked to make connections and show evidence of higher level thinking skills. A summer assignment is a requirement of the course. Students will be asked to complete this assignment during the month of August.

**AP Environmental Science**Course #2513  
#2514  
#2515

3 trimesters

Grade Level: 10 - 12

Prerequisite: Biology A  
Chemistry A

The AP Environmental Science course is designed to engage students with the scientific principles, concepts, and methodologies required to understand the interrelationships within the natural world. The course requires that students identify and analyze natural and human-made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them. Environmental science is interdisciplinary, embracing topics from geology, biology, environmental studies, environmental science, chemistry, and geography.

**\*\*Pending Board of Education Approval\*\***

**AP Physics 1**

2 trimesters

Grade Level: 11 - 12

Course # 2504  
# 2505

Prerequisite: Physics A, Algebra 2

Recommended: Physics B,

AP Physics 1 is designed to be the equivalent of an introductory math-based college freshmen course in Kinematics. Units of study include mechanics, energy, momentum, circular motion, gravitational forces, and fluid forces. The ultimate goal of this course is to prepare students to be successful on the AP Physics1 exam at the end of the year.

**Biology A**

1 trimester

Grade Level: 9 - 11

Course # 2205

Prerequisite: None

Biology A is designed to give students an overall view of Environmental Biology. The major areas of study are aligned with the Next Generation Science Standards. Units of study will include 1) Matter and energy in ecosystems, with specific areas of study on photosynthesis, cellular respiration, matter and energy cycles 2) Interdependent relationships in Ecosystems, with an emphasis on biodiversity and carrying capacity 3) Human Activity and Biodiversity, with an emphasis on reducing human impacts 4) Natural Selection looking at variation of traits, adaptations of populations, speciation and extinction.

**Biology B**

1 trimester

Grade Level: 9 - 11

Course # 2206

Prerequisite: Biology A

Biology B is designed to give students an overall view of Heredity: Inheritance and Variation of Traits. The major areas of study are aligned with the Next Generation Science Standards. Units of study will include 1) DNA Structure and Function investigating protein synthesis, variation in organisms and mutations 2) Mitosis, Meiosis and Cell Differentiation where students will explore the process and purpose of cell division as well as the process where cells develop into specific somatic cells 3) Mendelian and Modern Genetics exploring the inheritance of traits and sources of genetic variation and 4) Evolution with an emphasis on evidence of common ancestry and diversity as well as factors that cause evolution.

**Botany & Greenhouse Management**

3 trimesters

Grade Level: 9 - 12

Course # 2606

# 2607

# 2608

Prerequisite: None

This course provides students awesome hands on experiential learning opportunities. Students will learn plant anatomy, physiology, soils and plant nutrition, tree and wildflower identification, maple syrup production, forestry and greenhouse management. Hands-on experience in our greenhouse, woodlot and maple syrup production operation will take learning out of the classroom into real life scenarios. Students in this class will have opportunities to improve leadership, personal growth and practical skills through participation in the Mason FFA Chapter.

**Chemistry A**

1 trimester

Grade Level: 9 – 11

Course # 2301

This course will explore the basic foundations of the chemical world. This course will focus on experiencing and explaining phenomena, participating in class discussions, laboratory investigations, and problem solving activities. A scientific calculator is needed for this course.

**Chemistry B**

1 trimester

Grade Level: 9 – 11

Course # 2302

Prerequisites: Chemistry A

This course is aimed at students who are looking to advance their understanding of chemical concepts. The course will focus on experiencing and explaining phenomena, participating in class discussions, laboratory investigations, and problem solving activities. A scientific calculator is needed for this course.

**Earth Science A**

1 trimester

Grade Level: 9-11

Course # 2101

Prerequisites: None

Earth Science A begins with the exploration of bizarre phenomenon in our universe, including exploding stars, the expansion of space, and patterns of our solar system. Our focus then narrows onto Earth and how energy from the sun explains our seasons. We end this course with investigations relating to climate change. Students analyze scientific evidence showing how Earth's systems are changing and how these changes are related. Although there is no prerequisite for this course, it is *highly recommended* that students complete Chemistry A before taking Earth Science A, as many of our discussions center around the components of atoms.

**Earth Science B**

1 trimester

Grade Level: 10-12

Course # 2102

Prerequisites: Earth Science A

Earth Science B builds upon the knowledge learned in Earth Science A. We begin by investigating Earth's different systems and recognizing how these systems affect each other. Students also explore how these systems have changed over time by examining Earth's geologic history and how humans are currently impacting these systems. Students construct scientific models to explain the interactions and processes they learn to further understand about the world we live in.

**Environmental Science**

1 trimester

Grade Level: 9-12

Course #2603

Prerequisites: None

This elective class is an introduction to how humans interact with the environment in a wide range of capacities. Students will explore the science behind food plots, composting, pollution, plant and fungi identification, land management, and national park usage. Students will also investigate alternative energies and modern methods used to tackle environmental problems. Hands-on projects will be utilized to help students understand the science behind how humans survive and interact with the environment on a day to day basis.

**Forensic Science**

2 trimesters

Grade Level: 11 - 12

Course # 2403

Prerequisite: Chemistry and/or

# 2404

Physics

Forensic Science is the application of science to the law. The study of science offers the knowledge and technology needed for the use of evidence in both criminal and civil cases. Problem solving will be the focus for this science course. Students will be expected to work in teams, theorize, design experiments, research forensic methodologies analyze and synthesize information, and make conclusions based on evidence.

**Natural Resources Management**

2 trimesters

Grade Level: 9 - 12

Course # 2603

Prerequisites: None

# 2604

This course will take a local perspective on the scientific principals and issues related to different ecosystems (prairies, forests, aquatic, etc.). Focus will be given to water quality, soils, and land use. This course will also focus on practical knowledge and identification of local trees, wildflowers, wildlife and aquatic species.

**STEM (Science, Tech. Engineering, and Math)**

1 trimester

Grade Level: 10-12

Course # 2107

Prerequisites: Algebra 1

Science, Technology, Engineering and Math (STEM) is a project and lab based course where students will have the opportunity to explore and experience the process of engineering. The projects and labs are inspired by the sciences while integrating math and technology throughout. This course will focus on the process of defining a problem, designing a solution, constructing prototypes, and redesigning prototypes to improve results.

**Physics A**

1 trimester

Grade Level: 9 - 11

Prerequisite: Algebra 1

As an introduction to Physics course, students in this course will study motion in one dimension, Newton's laws, work and energy, electric circuits, and waves and sound. Students will have many lab opportunities to apply the ideas they are learning and will be asked to solve real-world problems as well. Use of mathematics is not a primary aim of the course, but mathematical thinking and reasoning is very important, and students will be expected to apply many ideas from Algebra 1.

**Physics B**

1 trimester

Grade Level: 9 - 12

Prerequisite: Algebra 1, Geometry and Physics A

This course is aimed at students who are looking to advance their understanding of the physical sciences. Physics B aims to add to, and to broaden, the ideas learned in Physics A. Students will study motion in two dimensions, momentum, gravitational forces, electrostatics, magnetism and electromagnetism.

**Physiology of Life**

1 trimester

Grade Level: 10-12

Prerequisites: Biology

Physiology of Life provides an opportunity for students to learn more about their personal health as well as a more in-depth overview of health related topics for students who are considering pursuing a medical occupation post high school. Over the course of one trimester, students will interact with content that will provide a better understanding about basic homeostatic parameters such as blood pressure and components of blood. Topics of study will include prevention and screening of disease, and the development and management of several common health conditions such as diabetes, fatty liver disease, lung disease and heart disease.

**Zoology & Veterinary Science**

3 trimesters

Grade Level: 9 - 12

Prerequisite: None

Course # 2610

2611

2612

This course provides students awesome hands on experiential learning opportunities. All aspects of animal anatomy, physiology and health will be taught in the classroom and brought to life with experiential learning opportunities. Experiential projects include incubation of eggs, raising broiler chickens, managing a small flock of sheep and managing pregnant pigs through the birthing and nursing process. Students in this class will have opportunities to improve leadership, personal growth and practical skills through participation in the Mason FFA Chapter.