

# SCIENCE DEPARTMENT

## Senior High School



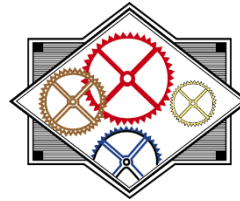
Arts & Communications



Business, Management Marketing & Technology



Health Science



Engineering/Manufacturing & Industrial Technology



Human Services



Natural Resources & Agriscience

VPAA – Meets Visual, Performing & Applied Arts Requirement

OLE – Meets Online Learning Experience Requirement

GR/MMC – Meets Graduation Requirements based on Michigan Merit Curriculum

SMR – Senior Math Related

21F – Course Available through Section 21F: Expanded Virtual Learning

C – Commitment Form

\*CAREER ZONES - Broad groupings of careers that share similar characteristics and whose employment requirements call for many common interests, strengths, and competencies.

<b>PHYSICAL SCIENCE</b> Physics/Chemistry (GR/MMC/OLE) (21F)– D070	9	1.0 credit
--	---	------------

Course Offered at Henry Ford II

This course will go more in depth with physics and chemistry concepts learned in previous science classes. This course will cover the Michigan High School Essential Benchmarks for physics and chemistry. The first semester is physics-based, with topics including forces and motion, work and energy, electricity, sound and waves, and light and optics. The second semester is chemistry-based and includes the topics of matter, the periodic table, heating and cooling, and water and solutions. The course is heavily lab-oriented, with 2-3 labs being done per week. Most work is done in class; therefore, good attendance is very important\**Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

<b>BIOLOGY I</b> (GR/MMC/OLE) (21F) – D020	<b>REQUIRED CLASS</b>	10, 11, 12	1.0 credit
--	-----------------------	------------	------------

Biology I follow the Michigan Merit Curriculum as determined by the MI Department of Education. Students develop science literacy through inquiry, application of knowledge and reflection. Students delve into the wonders of the science of life through lecture, labs, and other hands-on activities. This course aims to provide students with the information and perspective.

\**Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**ADVANCED PLACEMENT BIOLOGY** (GR/MMC/OLE/C) (21F) – D040 11, 12 1.0 credit

PREREQUISITE: Biology and Chemistry

Advanced Placement Biology is an introductory college level biology course. The curriculum, textbook and laboratory activities are equivalent or similar to those used in college. Students may earn college credit by successful achievement on the AP exam as determined by College Board. The course aims to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. Any student interested in the medical field or just interested in the science of life should enroll in this course.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**PHYSIOLOGY** (GR/MMC/OLE) (21F) – D050 11, 12 0.5 credit

Physiology is the study of the structure and function of the human body. Emphasis is on normal homeostasis and imbalances that lead to disease. This is a lab-based course, with many hands-on activities that generate interest among students. All students can benefit by knowing how their bodies function and how disease impacts lives. This course is especially recommended for those interested in health care.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**ENVIRONMENTAL SCIENCE** (GR/MMC/OLE) (21F)– D060 11, 12 0.5 credit

Environmental science explores Earth's natural systems, as well as how human activity affects the environment; students will apply the scientific method to investigate natural flows of chemicals, water and energy in terrestrial, aquatic, and atmospheric systems, and how humans impact these natural flows and systems. Students will learn methods for helping to make Earth a sustainable environment through stewardship and sound science. Students will be encouraged to discuss environmental problems and concerns through current events, projects, and laboratories.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**CHEMISTRY** (GR/MMC/OLE) (21F) – D130 10, 11, 12 1.0 credit

PREREQUISITE: Algebra I

This class deals with the composition of materials and the changes that they may undergo. The concepts, laws, and theories explaining the properties and behavior of elements and compounds are discussed. Laboratory experiences are an essential part of this course. This college prep class focuses on a broad spectrum of chemistry topics that include: Atomic Theory, Nuclear Chemistry, Organic Chemistry, Naming, The Periodic Table, Bonding, Reactions, Thermochemistry, Acid Base Chemistry, States of Matter, Kinetics and Equilibrium.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**ADVANCED PLACEMENT CHEMISTRY** (GR/MMC/SMR/OLE/C) (21F) – D160 11, 12 1.0 credit

PREREQUISITE: Chemistry and Algebra II

AP Chemistry is a college level chemistry course. This course differs qualitatively from the usual first secondary school course in chemistry with respect to the kind of textbook used, the topics covered, the emphasis on chemical calculations and mathematical formulation of principles, and the kind of laboratory work done by the students. For some students, an AP Chemistry courses enables them to undertake, as freshmen, second-year work or to register for courses in other fields where general biology, chemistry, and physics is a prerequisite. For other students, the course fills the laboratory science requirement and frees time for other courses.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**ANALYTICAL CHEMISTRY (FORENSIC SCIENCE) (GR/MMC/OLE) – D180** 11, 12 0.5 credit

PREREQUISITE: Chemistry

This is a lab-based CSI course. Chemistry, biology, earth science, and physics are combined to solve mysteries and answer questions brought into a court of law. As we learn the concepts of forensic science, students are required to apply what they have learned to the unique circumstances of a crime situation. The level of sophistication that forensic science has brought to criminal investigations is awesome. Once all the drama of a forensic science case is put aside, what remains is an academic subject emphasizing science and technology. In this semester course, students will become more familiar with blood, fingerprints, hair and fibers, drugs and poisons, and human remains. This course is available to juniors and seniors who are currently enrolled in chemistry or have had chemistry.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**ORGANIC CHEMISTRY (GR/MMC) – D190** 11, 12 0.5 credit

PREREQUISITE: Chemistry

This is a semester class for those students who have successfully completed chemistry or AP Chemistry. Organic Chemistry is usually a second-year college class. This semester class will cover the fundamentals of organic chemistry that are taught in a first semester college organic course. Topics include but are not limited to: Structure and Bonding, Polar Covalent Bonds, Acids and Bases, Stereochemistry, Nomenclature, and Reactions. Organic Chemistry is needed for many science related majors and opens the doors to many careers in medicine, research, nursing, animal science, dietary science, engineering, pharmacy, forensics etc.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**PHYSICS (GR/MMC/OLE/SMR) (21F) – D210** 11, 12 1.0 credit

PREREQUISITE: Concurrent with Algebra II or higher

This class deals with the natural world of matter and energy. Areas of physics covered include: classical mechanics, electricity & magnetism, waves, sound, optics, and nuclear physics. Conceptual knowledge of physics and physics problem solving will be assessed with homework, labs, and tests. An understanding of Algebra is necessary for success in the class; any trigonometry needed should be covered in the class. The course is strongly recommended for college bound students. Recommended that students take co-current with Algebra II or higher.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**ADVANCED PLACEMENT PHYSICS I – Algebra Based (GR/MMC/OLE/SMR/C) (21F) – D830A/B** 11, 12 1.0 credit

PREREQUISITE: Geometry or concurrently taking Algebra II

AP Physics I- Algebra Based is a college level physics course. Students will learn about the foundational principals of physics as you explore Newtonian mechanics; work, energy, and power; mechanical waves and sound; and introductory, simple circuits. Students will do hands-on laboratory work to investigate phenomena.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**ADVANCED PLACEMENT PHYSICS C – MECHANICS** (GR/MMC/C/SMR) (21F) – D235 12 1.0 credit

PREREQUISITE: Completed or Concurrently taking Calculus

AP Physics C – Mechanics similar to a college-level, calculus-based physics course. It is to be taken following first year algebra-based physics. The class is devoted to fundamental topics in classical Newtonian mechanics. The amount of calculus necessary for success is taught in the class. Students coming out of the courses should have a strong conceptual understanding of physics and well-developed skills in performing and analyzing laboratory experiments. They should also be able to apply their understanding to approach and solve problems that are essentially new to them. College based labs are included in the instruction and a variety of statistical analysis techniques are used. This is a very rigorous academic class which challenges students' intellect as well as their work ethic. It is most beneficial for those going into engineering or any science/mathematics related field.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**ASTRONOMY** (GR/MMC/OLE) (21F) – D250 11, 12 0.5 credit

PREREQUISITE: Biology and 1 science credit

Astronomy is a branch of science dealing with that part of the universe which lies beyond the Earth's atmosphere. The course addresses the location, motion, and nature of the objects in space. Topics of study include the universe, the evolution of our solar system, the laws of nature, and the past, present, and future of the space program.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*

**ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE** (GR/MMC/OLE/C) (21F) – D270 11, 12 1.0 credit

PREREQUISITE: Physical Science, Biology and Algebra I

Advanced Placement Environmental Science is a full-year, elective course for students with a strong interest in environmental science. Students will be challenged to analyze and interpret data and apply concepts to the solution of environmental problems. In addition, students will learn more about the environment in which they live in and the effect of man on the environment. Laboratory investigations will also be included to enhance the students' understanding of the concepts developed.

*\*Course content may address skills pertaining to these potential Career Zones: Engineering, Manufacturing & Industrial Technology*