

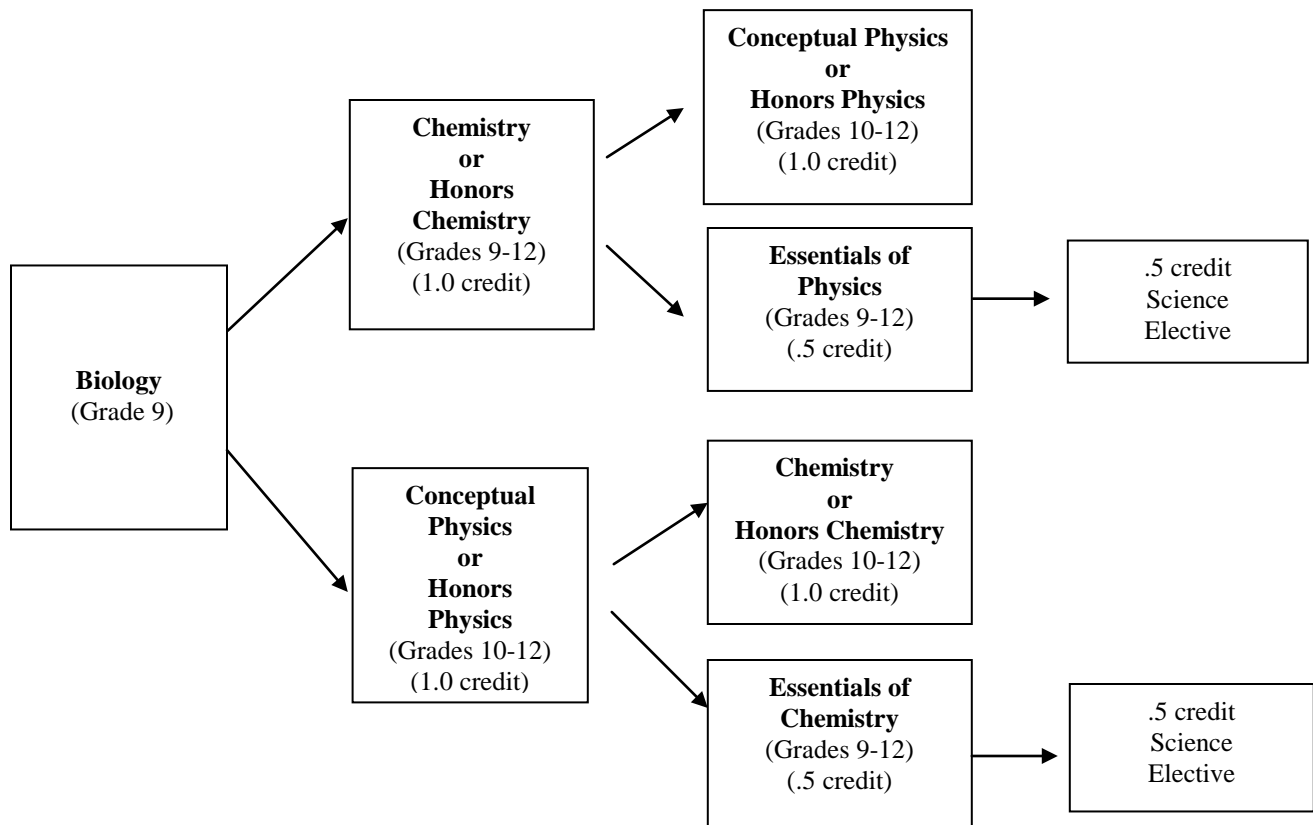
SCIENCE

All students must complete courses in Biology, Chemistry, and Physics.
Three (3) credits are required in Science for grades 9-12 as follows:

- 1.0 credit Biology
- 1.0 credit in Chemistry or Physics
- 1.0 credit of additional science

- Principles of Technology may be taken for .5 credit of an elective science.
- The Cosmetology or Culinary programs at Oakland Schools Technical Campuses may be taken for a .5 credit of an elective science.

GRADUATION REQUIREMENTS



For additional science electives, see course descriptions.

SCIENCE

ASTRONOMY AND METEOROLOGY

0.5 credit, grades 10-12

This course provides coverage of major concepts in earth science. Areas to be covered are astronomy (solar system, galaxy, and universe), the atmosphere, weather, and climatology. Laboratory experiments will provide hands on experience reinforcing these concepts.

AP BIOLOGY

1.5 credit, grades 10-12

Prerequisites: Successful completion of Biology, Honors Chemistry/Chemistry, or concurrently taking Honors Chemistry/Chemistry course. Advanced Placement Biology is a college level biology course. The textbook and laboratory activities are equivalent to those used in college. This 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. Finally, the course aims to prepare students for the Advanced Placement Exam, which is an important (although not required) component of the class.

AP CHEMISTRY

1.5 credits, grades 10-12

Prerequisite: Successful completion of and demonstrated competencies in Chemistry or Honors Chemistry. This course is specifically designed as the second course in a two-course program for college chemistry preparation. The course will prepare students for chemistry at the university level, giving students the opportunity to earn college credit by taking the AP test in Chemistry in the spring. Students who enroll in AP Chemistry should have a solid foundation in inorganic chemistry from Chemistry, and will be expected to be highly motivated and responsible. Topics will include oxidation and reduction, electrochemistry, chemical kinetics and rate laws, coordination compounds, colligative properties, reaction rates and mechanisms, nuclear chemistry, and organic nomenclature and synthesis.

AP PHYSICS

1.5 credits, grades 11-12

Prerequisite: Honors Physics. This course is designed to prepare students planning to take physics in college and may choose to take the Physics Advanced Placement Exam. Students will be exposed to solving a wide variety of problems using the principles and laws governing the behavior of the inanimate world around us. The topics covered are motion, force, work, energy, power, thermodynamics, physical properties of matter, sound, light, electricity, magnetism and atomic/nuclear physics. Laboratory experiments and a variety of other activities are used to assist learning. A strong math background is required.

BIOLOGY

1.0 credit, grades 9-12

An ecological approach is used to study the interrelationships of organisms. Units are also included covering cellular biology, ecology, living things, genetics, evolution, and invertebrate anatomy. Laboratory experiments will provide hands on experience reinforcing these concepts.

CHEMISTRY

1.0 credit, grades 9-12

Prerequisite: Biology and successful completion or having earned one credit in Integrated 2, Algebra 1, or Honors Geometry. This course will provide students with a solid foundation of chemistry principles using the lab setting to reinforce the topics presented in the classroom. Chemistry exposes students to a variety of topics according to the required Michigan High School Content Expectations including naming and writing chemical formulas, reaction types, chemistry calculations, thermochemistry, gas laws, solutions, acids/bases, reduction/oxidation reactions, and organic chemistry.

CONCEPTUAL PHYSICS

1.0 credit, grades 10-12

Prerequisite: Biology, Integrated 1 or Algebra 1. This course is a non-math based course designed to expose the students to a variety of topics in the area of Physics and motivate within them some interest and enthusiasm for science and its importance. Basic algebra skills will be utilized to help reinforce concepts. Conceptual Physics is intended to not only prepare the student for the Physics portion of the MME but to also meet Michigan's high school graduation requirements. Students will study the following areas: Motion of Objects, Forces and Motion, Forms of Energy, Energy Transformations, Electricity, Sound, and Waves. This class counts toward the Physics graduation credit.

ENVIRONMENTAL SCIENCE

0.5 credit, grades 9-12

Prerequisite: Biology. Environmental Science is an ecology-based class designed to focus on the relationships between humans and the environment. Through a combination of case studies, labs, projects, and outdoor explorations, students will investigate the effects humans have on our natural ecosystems and what can be done to counteract and improve the results on a local and global level.

ESSENTIALS OF CHEMISTRY

0.5 credit, grades 9-12

Prerequisite: Biology. This course is designed to expose the students to a variety of topics in the area of Chemistry and stimulate within them some interest and enthusiasm for science and its importance. Also, the student will learn through experience how ideas are developed and tested using scientific procedures and processes. In addition, Essentials of Chemistry is intended to prepare students for the Chemistry portion of the MME. With that in mind, all the essential Chemistry high school Expectations and Standards will be taught in the following areas: Forms of Energy, Energy Transfer and Conservation, Properties of Matter and Changes of Matter. This class will count as a science elective for graduation credit but not as the Chemistry or Physics graduation credit.

ESSENTIALS OF PHYSICS

0.5 credit, grades 9-12

Prerequisite: Biology. This course is designed to expose the students to a variety of topics in the area of Physics and stimulate within them some interest and enthusiasm for science and its importance. Also, the student will learn through experience how ideas are developed and tested using scientific procedures and processes. In addition, Essentials of Physics is intended to prepare students for the Physics portion of the MME. With that in mind, all the essential Physics high school Expectations and Standards will be taught in the following areas: Motions of Objects, Forces and Motion, and Forms of Energy and Transformations. This class will count as a science elective for graduation credit but not as the Chemistry or Physics graduation credit.

GEOLOGY

0.5 credit, grades 10-12

This hands-on-elective earth science course will develop the vocabulary and conceptual knowledge necessary for presenting and explaining major environmental issues that face the world today. Topics of study include: minerals, rocks, limited resources, earth's interior, plate tectonics and erosional forces that reshape the earth's surface. This class frequents the outdoors for hands on study in all weather conditions with advance notice. Students may be required to change and bring adventure appropriate gear.

HONORS CHEMISTRY

1.0 credit, grades 9-12

Prerequisite: Successful completion of having earned one credit in Algebra 1 or Honors Geometry. Freshmen may enroll in Honors Chemistry with permission of the science department head. Chemistry is specifically designed as the first course in a two-course program for college chemistry preparation. Students who have a deep interest in science and expect to use chemistry knowledge in college and in their career, should enroll in Honors Chemistry, followed by AP Chemistry the next year. The course closely parallels freshman college chemistry, and is academically demanding, with a high degree of self-discipline and responsibility expected of students. Topics will include details of inorganic chemistry, including gas laws, quantum theory, chemical bonding and molecular orbital theory, solutions, thermodynamics and kinetics, acid/base reactions, equilibrium systems, inorganic nomenclature and prediction of reaction products.

HONORS PHYSICS

1.0 credit, grades 10-12

Prerequisite: Biology, Advanced Algebra. This course is designed to expose the students to a variety of topics in the area of Physics and motivate within them some interest and enthusiasm for science and its importance. The student will learn through experience how ideas are developed and tested using scientific procedures and processes. Honors Physics is intended to not only prepare students for the Physics portion of the MME, but to also meet Michigan's new high school graduation requirements. With that in mind, all the essential and core Physics High School Expectations and Standards will be taught in the following areas: Motion of Objects Forces and Motion, and Forms of Energy and Transformations. This class will count as the Physics graduation credit. This course will differ from Conceptual Physics in that mathematical concepts will be stressed to reinforce important concepts. A strong mathematics background is required.

HUMAN ANATOMY AND PHYSIOLOGY

1.0 credit, grades 11-12

Prerequisite: Biology. Human anatomy and physiology is a detailed study of the major body systems. The study of each system will include anatomy, physiology and possible disorders components. Although there will be some dissection, lab work will stress physiology of the systems. This class will be especially helpful to those considering medical or health related careers. The final section of the class will include instruction and certification in Red Cross Adult/Child/Infant First Aid/CPR/AED.

INDEPENDENT STUDY

0.5 credit, grades 11-12

Prerequisite: Approval of the Science Department Committee. Students will design a scientific investigation on a specific topic. The first objective will be research on the assigned problem. Their second objective will be to carry out findings in the research room through actual laboratory work. Each student will write a paper upon completion of the investigation. Students must prepare a study or work plan for the teacher who will be responsible. After approval by the teacher, one copy of each will be retained by the teacher and student, and the other copy will be sent to the counselor's office. This must be done before registration. The final project will be evaluated and graded by a committee from the Science Department.

ORGANIC CHEMISTRY

0.5 credit, grades 10-12

Prerequisite: Chemistry or Honors Chemistry. This class focuses on organic chemistry, including nomenclature, synthesis, polymer chemistry and its importance in society.

SCIENTIFIC INQUIRY

0.5 credit, grades 9-12

Prerequisite: Introduction to Statistics or AP Statistics recommended. This class will focus on developing the skills to think like a scientist. Students will investigate scientific questions by collecting evidence, analyzing the evidence, formulating explanations based on the evidence, communicating these findings, and comparing their results with the consensus in the scientific community. Critical thinking and mathematical skills will be used to investigate case studies that focus on, but are not limited to, biological and ecological concepts. The case studies may use evidence from current real-world research or evidence that is student-collected in the lab. This class will be especially helpful to those considering a career in the sciences.

ZOOLOGY

1.0 credit, grades 10-12

Prerequisite: Biology. Zoology is designed for those students desiring greater experiences in the biological sciences. This two-term course covers animal anatomy and physiology along with classification of the animal kingdom. General areas of study include levels of organization, the anatomical and physiological characteristics of all major animal phyla, ecological adaptations, and laboratory techniques. Students will conduct labs including dissections and learning some of the characteristics used to identify local animal species. This course will also serve to familiarize students with educational and occupational opportunities in the field of zoology. Zoology is designed to prepare students for college science courses.