SCIENCE DEPARTMENT

Name	Credit	Grade	Length	Pre-Requisite	Instructor Approval	College Credit Available	Fee
Physical Science	1.0	9-12	Year	No	No	No	No
Advanced Physical Science	1.0	9-12	Year	Application	No	No	No
Biology	1.0	10-12	Year	Phys. Science or Adv. Phys. Science	No	No	No
Advanced Biology	1.0	10-12	Year	Advanced Physical Science with a grade of "B" or better or Administrative Approval	Yes	No	No
Zoology	0.5	11-12	First Sem.	Biology with a "C" or better or administrative approval	No	No	Yes
Botany	0.5	11-12	Second Sem.	Biology with a "C" or better or Admin. Approval	No	No	Yes
Natural History of Oregon	0.5	9-12	First Semester	No	No	No	No
Parks and Wildlife Management	0.5	9-12	Second Semester	No	Yes	No	No
AP Environmental Science	1.0	11-12	Year	Phys. Sci. and Biology Algebra Recommended	No	With passing score on AP Exam	AP exam fee
Chemistry	1.0	10-12	Year	Currently enrolled in Alg.II	No	No	Yes
AP Chemistry	1.0	12	Year	Chemistry	No	Yes	Yes and AP exam fee
Physics	1.0	11-12	Year	Alg. II	No	No	No
Oceanic Science	1.0	11-12	Year	Phys. Sci. and Bio.	No	No	No
Anatomy and Physiology	1.0	11-12	Year	"B" or better in Biology	No	No	Yes
Principals of Engineering	1.0	10-12	Year	Instructor Approval	Yes	Yes	No

See Industrial Technology Department on pages 24-32. The following courses also award Science credit:

Veterinary Science
College Credit Animal Science
Equine Science
Horses and Horsemanship
Plant and Soil Science
Gardening

PHYSICAL SCIENCE

Entry Level: 9, Year

Physical science encompasses a wide variety of scientific disciplines, including physics, chemistry, geology, and space science. By the end of the first semester students will be able to: (1) Describe fundamental forces and the motions resulting from them; and (2) Explain and analyze the interaction of energy and matter. Second semester general content areas include chemistry, geology, and space science. By the end of the second semester students will be able to (1) Understand structure and properties of matter; (2) Describe and analyze chemical and physical changes; (3) Explain and analyze changes occurring within the lithosphere, hydrosphere, and atmosphere of the Earth; and (4) Explain relationships among the Earth, sun, moon, and the solar system. Teaching methodologies will include lecture, laboratory activities, interactive games, and research projects. Students will keep a laboratory notebook or binder and complete at least one homework assignment per week. Reading assignments from the physical science textbook will be used to support learning objectives.

ADVANCED PHYSICAL SCIENCE

Prerequisite: Teacher recommendation and an application process.
Entry Level: 9, Year

This course is an activity-oriented physical science course. Advanced Intro to Physical Science reviews the scientific method, various branches of physical science, the metric system, and lab safety. The study of chemistry and physics is introduced with such topics as the structure and interactions of matter, motion, forces, and energy. Topics will be covered in greater depth and detail. There will be a high level of expectation from all students. A semester grade of "A" or "B" is necessary to remain in the course. Opportunities to produce CIM certification work samples will be available in this class.

BIOLOGY

Prerequisite: Intro to Physical Science
Entry Level: 10, Year

This course will focus on the living world around us. The learning objectives of biology include:

- To develop and understanding and appreciation for the science of life
- To develop laboratory skills through use of standard laboratory equipment
- To apply biological concepts to the world around
- To develop effective study skills

Students will investigate the characteristics and interactions of organisms representing the six Kingdoms of living things. Major emphasis is placed on ecology, use of the compound light microscope, cell biology, genetics, evolution and natural selection, and classification. Primary methods of instruction will include lecture and assignments, both in-class and as homework. Several laboratory investigations will be conducted in addition to occasional research projects. Students will also have opportunities to complete scientific inquiry work samples.

ADVANCED BIOLOGY

Prerequisite: Advanced Physical Science grade of B or higher or Teacher/ Administrative Approval
Entry Level: 10, Year

Advanced Biology is a course designed to provide the following objectives: To develop an understanding and appreciation for the science of life

- To develop laboratory skills through use of standard laboratory equipment
- To apply biological concepts to the world around
- To develop effective study skills

Major emphasis is placed on ecology, cell biology, modern genetics and biotechnology, evolution and natural selection, classification, zoology, and botany. Primary methods of instruction will include lecture and assignments, both in-class and as homework. Several laboratory investigations will be conducted in addition to occasional research projects. Students will also have opportunities to complete scientific inquiry work samples. This is an accelerated course that investigates the topics listed above in great detail. This course should be taken by students who are seriously interested science and who understand that they will be expected to work independently outside of class. A semester grade of "A" or "B" is necessary to remain in the course.

AP ENVIRONMENTAL SCIENCE

Prerequisite: Required: Physical Science and Biology. Recommended: Algebra

Entry Level: 11-12, Year

AP Environmental Science (APES) is a rigorous course designed for highly motivated students that may have a desire to complete college level courses before finishing high school. The course will focus on the following themes:

- Science is a process.
- Energy conversions underlie all ecological processes.
- The Earth itself is one interconnected system.
- Humans alter natural systems.
- Environmental problems have a cultural and social context.
- Human survival depends on developing practices that will achieve sustainable systems.

Students may qualify for advanced placement examinations. Sufficiently high scores on these examinations may enable the student to earn college credit, but each college and university has individual policies towards AP courses. Sandy High School credit for this course is an elective science. APES students should be prepared for lectures, labs, and simulations in class and a fair amount of work outside of class. Reading assignments will include magazine and newspaper articles, excerpts from books, and professional journal articles. APES students will also be doing field research and activities and a year long service learning project and communicating with professionals and other APES students throughout the year. *This course can be applied to the Honors Diploma.

ZOOLOGY

Prerequisite: Biology with a "C" or better or administrative approval
Entry Level: 11-12, Semester 1

In this course students will investigate the Kingdom Animalia. Major topics include animal classification, arthropods, invertebrates, fish, amphibians, reptiles, birds and mammals with a concentration on classification, anatomical form and function, and ecology. This is a college preparatory course designed for students interested in pursuing undergraduate degrees related to biology, anatomy, ecology, or zoology. Most students will find the requirements of this course challenging but rewarding. An emphasis is placed on both demonstrated knowledge of lecture and reading material as well as laboratory and special projects. Numerous animal dissection labs are required. A field trip to the Oregon Coast Aquarium is offered in this class. A lab fee is required for this class. *This course can be applied to the Honors Diploma.

BOTANY

Prerequisite: Biology with a "C" or after or administrative approval
Entry Level: 11-12, Semester 2

Botany is the biology of plants. This is an introductory course designed to give students a broad understanding of the many disciplines in the science of Botany including – plant morphology, anatomy, physiology, evolution, genetics, taxonomy, and ecology of plants. Much of the daily work involves individual and group activities and laboratory investigations. The major, individual project is a plant collection emphasizing the gathering, classification and presentation of local flowing plants. This class also participates in the 3-day, Sagebrush Expedition to central Oregon in May. A lab fee is required. *This course can be applied to the Honors Diploma.

CHEMISTRY

Prerequisite: Concurrent with Alg II
Entry Level: 10-12, Year

The objective of chemistry is to show students the importance of chemistry in other science fields, as well as their daily lives. This course provides students with the necessary background in modern chemistry for further science classes, including advanced chemistry courses. Furthermore, the concept that chemistry is a vital, continually developing science is explored through literature studies, laboratory projects, and group work. There will be homework at least three times a week, on average, and working during class time is required for your success. Lab fees will be charged. *This course can be applied to the Honors Diploma.

ADVANCED PLACEMENT CHEMISTRY

Prerequisite: Chemistry
Entry Level: 11-12, Year

The AP Chemistry course is designed to be the equivalent of the general chemistry course usually taken during the first college year. For some students, this course enables them to undertake, as freshmen, second-year work in the chemistry sequence at their institution or to register in courses in other fields where chemistry is a prerequisite. For other students, the AP Chemistry course fulfills the laboratory science requirement and frees time for other courses. AP Chemistry meets the objectives of a good general chemistry course. Students in such a course attain a depth of understanding of fundamentals and a reasonable competence in dealing with chemical problems. The course contributes to the development of the students' abilities to think clearly and to express their ideas, orally and in writing, with clarity and logic. Recommended as a second year course. Lab fees will be charged. *This course can be applied to the Honors Diploma.

PHYSICS

Prerequisite: Algebra II
Entry Level: 11, Year
Offered in 2012-13 and alternating years: 2014-15

This mathematically-based activity-oriented curriculum focuses on the study of the laws of physics with an emphasis on classical mechanics including kinematics, dynamics, work and energy. Second semester will include waves, electricity, and magnetism. Computers will be used extensively in the lab for data acquisition and pre-calc as well as preparing lab reports. Successful completion of first semester is required to enroll in second semester. A lab fee is required for this class. *This course can be applied to the Honors Diploma.

NATURAL HISTORY OF OREGON

Entry Level: 9-12, Semester 1

In this semester-long, project-based learning class, students will explore the diverse geology, climate, flora and fauna of Oregon. Students who successfully complete this course will be able to identify native wild plants and wildlife, describe the diverse geobiological provinces of Oregon and demonstrate skills such as taxidermy and natural resources field census techniques. Students will have the opportunity to participate in various field trips.

PARKS AND WILDLIFE MANAGEMENT

Prerequisite: Instructor Approval
Entry Level: 9-12, Semester 2

In this class, "project-based learning" is emphasized. Students will explore the principles and current management practices relating to the fish, wildlife and parks. A major, end of the year project will be the maintenance and development of the high school's O'Harrow Natural Area, a 20-acre wildlife preserve with 2 miles of trails.
This class will involve some manual labor in an outdoor setting.

ANATOMY/PHYSIOLOGY

Prerequisite: A-B Grade in Biology
Entry Level: 11-12, Year

Human Anatomy and Physiology is designed for students who are interested in pursuing careers in allied health fields. Accurate information about the structure and function of the human body will be learned and applied in both classroom and lab settings. Lab fees will be charged. *This course can be applied to the Honors Diploma.

OCEANIC SCIENCE

Prerequisite: Physical Science and Biology with a "C" or better or administrative approval.
Entry Level: 11, Year

Oceanic Science is a year-long course designed to enable students to acquire knowledge and skill from several areas of biology, chemistry, physics and geology through the study of oceans. From tidal waves to tidal pools, volcanic vents to seasonal seas, Oceanic Science will give students the opportunity to learn about and appreciate the complexities of ocean ecosystems and the nature of the organisms that reside within. This is a lab course with required project-based learning and maintenance of a journal that will contain the bulk of daily work and constitute the majority of an individual's grade. *This course can be applied to the Honors Diploma.

PRINCIPLES OF ENGINEERING ™

Prerequisite: Instructor approval
Entry Level: 10-12, Year

This hands-on problem-based course is designed to help students understand the field of engineering and engineering technology. Students will learn how engineers and technicians use math, science, and technology in an engineering problem solving process. Units of study include engineering communication, documentation, and design as well as mechanics, energy, fluids, electricity, and materials. The course also includes concerns about social and political consequences of technology change. *This course can be applied to the Honors Diploma.