

SCIENCE (SC)

SC-111 Science of Everyday Materials (4 credits)

This course will cover basic physical sciences concepts as well as selected material science aspects. It will focus on fundamental principles of structure and properties of materials utilized in art and engineering. Properties of materials will be related to atomic, molecular and crystalline structures. Students will study properties of metals, ceramics, multiphase systems, paper and polymeric materials. Some of the content might change according to the interests and expertise of the faculty who are teaching it. Areas which might be included are chemistry and physics of glues, pigments, dyes; biopolymers and materials suitable for food industry; green materials and design; etc. Students will be able to make the relationships between structure and electrical, mechanical, thermal and chemical properties. Laboratory component will offer opportunity to learn lab skills and applications of physical and material sciences, and develop analytical ability (Lev 1 and 2) conducting experiments and analyzing data (Problem Solving Lev 1 and practicing of Analysis Lev 3). Students will learn about safety, proper handling and waste disposal techniques. Multiple opportunities to practice Problem Solving framework will be provided in order to solve science problems in class and in the laboratory.

Prerequisite(s): QL-122

SC-112 Science and Women (3 credits)

Science and Women establishes a foundation in the biological sciences with a strong emphasis on the role of women in all aspects of science from research to choosing science as a career. Students in the course will develop a scientific understanding of the natural world focusing on biological systems and will gain an understanding of both the historical and current roles of women in science. By the end of the course successful students should be able to effectively communicate on issues of recruitment, education, and retention of women in the sciences. In Science and Women students will develop and use analysis skills for understanding, investigating, and articulating biological and other science related topics. Students will examine how gender bias has shaped many aspects of the sciences from the basic process of doing science to complex systems found within humans and the environment. By analyzing these biases and seeing their impact on teaching and the sciences students can begin to appreciate how science is interwoven with society. The course will also explore how science is influenced by values and how these values vary across genders and cultures. The course will also look at current work done on the learning styles of girls and women and apply these findings to the scientific approach, the teaching of science, and the recruitment of women into the sciences.

Prerequisite(s): Analysis Level 1. QL-122 completed or concurrent.

SC-112L Topics in Human Biology (1 credit)

Labs will include hands-on experiments and computer simulations.

SC-114 Foundations of Earth Science (4 credits)

This course includes discussion, lab, and two mandatory field trips. The student focuses on an analysis of selected earth and space systems and concepts. They study aspects of geology (materials and landforms of the earth's crust and dynamic processes that change and shape the crust), meteorology (weather and climate), and space and planetary science. They investigate forces forming and driving these systems and the interrelationships among these systems. They also evaluate effects of human activities on the earth's systems.

Prerequisite(s): QL-122 Spring 2023: Field trip dates are Saturday, April 22 and Saturday, May 6.

SC-114C Foundations of Earth Science (4 credits)

This course includes discussion, lab, and two mandatory field trips. The student focuses on an analysis of selected earth and space systems and concepts. They study aspects of geology (materials and landforms of the earth's crust and dynamic processes that change and shape the crust), meteorology (weather and climate), and space and planetary science. They investigate forces forming and driving these systems and the interrelationships among these systems. They also evaluate effects of human activities on the earth's systems.

Prerequisite(s): QL-122

SC-117 Physical Science (4 credits)

Areas of study include selected aspects of physics, chemistry, and Earth and atmospheric science. The student learns how scientists know, what constitutes evidence, and how hypotheses are developed and tested. They study concepts that are common to all the natural sciences and learn how those concepts are applied to such different systems as moving objects, reacting chemicals, and shifting tectonic plates. They practice the methods of the physical sciences in the laboratory.

Prerequisite(s): QL 120 or QL-122

SC-117C Physical Science (4 credits)

Areas of study include selected aspects of physics, chemistry, and Earth and atmospheric science. The student learns how scientists know, what constitutes evidence, and how hypotheses are developed and tested. They study concepts that are common to all the natural sciences and learn how those concepts are applied to such different systems as moving objects, reacting chemicals, and shifting tectonic plates. They practice the methods of the physical sciences in the laboratory.

SC-118 Human Biology (3 credits)

The student analyzes and applies major concepts and theories of biological science. A strong emphasis is placed on the environmental concerns and human biology. The primary focus of the laboratory is the design and implementation of investigative projects. This course is only for students not taking any further science courses.

Prerequisite(s): QL-122

SC-118C Human Biology (3 credits)

The student analyzes and applies major concepts and theories of biological science. A strong emphasis is placed on the environmental concerns and human biology. The primary focus of the laboratory is the design and implementation of investigative projects. This course is only for students not taking any further science courses.

SC-118L Human Biology Lab (1 credit)

Integrated Science lab taken concurrently with SC-118.

SC-118LC Human Biology Lab (1 credit)

Integrated Science lab taken concurrently with SC-118.

Prerequisite(s): Concurrent registration with SC-118 or SC-112.

SC-119 Foundations of Chemistry (3 credits)

The student learns to apply major concepts and models of chemistry (physical changes and chemical reactions, classes of matter, moles, concentrations, the atom, types of chemical bonds, intermolecular forces) and related physics concepts (force, energy, conservation). As they do experiments involving these concepts, they make observations and measurements and use them to make reasonable inferences. They begin to develop hypotheses and to modify procedures to test them.

Prerequisite(s): QL-122 completed or concurrent., Must register concurrently for SC-119L.

SC-119L Foundations of Chemistry Lab (1 credit)

Foundations of Chemistry Lab

Prerequisite(s): QL-122, Must register concurrently for SC-119.

SC-120 Foundations of Biology (3 credits)

The student analyzes and applies major concepts, laws, and theories of biological science. A strong emphasis is placed on cell functioning, particularly on cell structure, energy metabolism, and genetics. A primary focus on the laboratory is the design and implementation of an investigative project. This course is required of all students planning to take additional science courses.

Prerequisite(s): QL-122 completed or concurrent. Must register concurrently for SC-120L.

SC-120L Foundations of Biology Lab (1 credit)

Foundations of Biology lab taken concurrently with SC-120.

Prerequisite(s): QL-122 completed or SC-1 & QL-122 completed or concurrent. Must register concurrently for SC-120.

SC-172 Career Exploration in Science: Math (1 credit)

This course does NOT fulfill the General Education Science requirement for any program. In this course students will engage and network with guest speakers (mostly women and Alverno alums) from various STEM professions in the exploration of STEM career paths. Students will research different STEM careers and use self-assessment to identify strengths and interests. Information from guest speakers will be used to identify appropriate professional experiences (internships, summer research, graduate school) to enhance career preparation.