

# SCIENCE (SCI)

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## SCI 101 The Planet Earth (0-3 credits)

This course focuses on the earth, its motion about the sun, and its interior structure. Topics in physics and chemistry, including wave motion, energy, states of matter, magnetism and crystallographic structure, will be introduced to provide background for the concepts covered in the course. Laboratory experiments enhance the lecture material and provide students with instruction in the scientific method.

**Course Rotation:** NY, PLV, Online: Fall, Spring, and Summer.

**Prerequisites:** This course does not have a prerequisite.

## SCI 105 Physics of Sound & Music (0-3 credits)

Physics of Sound and Music is an online introductory course, including lecture and lab, in acoustics and explores the physical principles of sound and music for nonscientists. No particular background in physics or mathematics above high school algebra is required. The course is designed to be appealing to and useful for both music majors and non-musicians. The course covers the basic theory of oscillations, sound waves, sound production, human auditory system. It then studies the mathematical and physical foundation of theory of music and finally applies the knowledge to various musical instruments. The experiments fall into two categories: 1. Some of them are done in the physics lab by the instructor and recorded a videos shared with the students for further observation and data analysis. 2 Others are web-based and done on computers or mobile devices using apps and simulations that are free of charge and easily accessible to the students.

**Course Rotation:** PLV: Summer 1 & Fall

**Prerequisites:** This course does not have a prerequisite.

## SCI 106 Scientific Measurements: Instruments, Units, and Metric System (1 credits)

### SCI 110 The Physical World (0-3 credits)

Basic physical science will be introduced from a broad historical and social perspective. The technological innovations and applications based upon this material will be discussed, with emphasis on their impact on societal changes. Laboratory experiments will correlate with lecture material and the student will be provided with modern computational methods for analysis of experimental data.

**Course Rotation:** Fall, Spring, and Summer.

**Prerequisites:** This course does not have a prerequisite.

### SCI 110S The Physical World - Learning Community (0-3 credits)

This learning community will examine the role and place of science in society. The course will focus on such issues as the acceptance of science and scientific principles in society and representations of science and the scientist in Western literature. Among works that will be discussed are New Atlantis (Francis Bacon); Brave New World (Aldous Huxley); Frankenstein (Mary Shelley); Strange Case of Dr. Jekyll and Mr. Hyde (Robert Louis Stevenson); Gulliver's Travels (Jonathan Swift); Journey to the Center of the Earth (Jules Verne); War of the Worlds (H. G. Wells); When Worlds Collide (Philip Wylie).

**Prerequisites:** This course does not have a prerequisite.

### SCI 115 Scientific Photography (0-3 credits)

**Prerequisites:** This course does not have a prerequisite.

### SCI 120 History and Philosophy of Science (3 credits)

An extensive study of the origin, development and contribution of science to society. Hypothesis in physics, chemistry and biology. The theory of relativity and causality in physics.

**Course Rotation:** NYC: Spring and Summer. PLV: Spring.

**Prerequisites:** This course does not have a prerequisite.

### SCI 123 History and Philosophy of Science (3 credits)

### SCI 130 Elements of Environmental Science (3 credits)

A scientific examination of the environment and man's impact on it. Among topics considered are: protection and/or decay of our air, water and mineral resources, population growth and control, the urban environment, solid waste, and alternative value systems.

**Course Rotation:** NY: Fall, Spring, and Summer. PLV: Fall and Summer.

**Prerequisites:** This course does not have a prerequisite.

### SCI 132 Physical Sciences (3 credits)

### SCI 140 Physical Geology (3 credits)

**Prerequisites:** This course does not have a prerequisite.

SCI 145 Environmental Geology (0-3 credits)

An investigation of the relationships between man and his geological environment. Discussion of population, hydrology, mineral resources, fossil fuels, geologic hazards, mining, construction and land use. Practical experience in topographic map interpretation.

**Course Rotation:** NYC: Spring - Even years. PLV: Fall - Odd years.

**Prerequisites:** This course does not have a prerequisite.

SCI 150 Astronomy (0-3 credits)

The mechanics of celestial movement and stellar behavior with an understanding of the universe in the past, present and future; seasonal variations of the evening skies and stellar configurations. Consideration given to the historical and structural development of astronomical bodies.

**Course Rotation:** NYC: Fall, Spring, and Summer. PLV: Fall and Spring.

**Prerequisites:** This course does not have a prerequisite.

SCI 150A Astronomy (4 credits)

This course focuses on the mechanics of celestial movement and stellar behavior and provides an understanding of the universe in the past, present, and future. Seasonal variations of the evening skies and stellar configurations will also be covered and consideration given to the historical and structural development of astronomical bodies. Online labs will be included.

**Prerequisites:** This course does not have a prerequisite.

SCI 150S Astronomy - Learning Community (0-3 credits)

This course combines the beauty and fascination of astronomy with the logical reasoning and problem solving techniques of mathematics. Students will learn connections between science and mathematics and study real-world problem solving processes, as well as customary topics in both subjects. Students will interactively learn to use an astronomical telescope to take measurements and obtain a practical understanding of astronomy. Typical problems in astronomy will be presented to students who will then in turn learn to solve them in the mathematics portion of the course. Field trips: Hayden Planetarium. Field work: 6-8 sessions outside with telescopes.

**Prerequisites:** This course does not have a prerequisite.

SCI 160 Meteorology (0-3 credits)

A study of the composition of the Earth's atmosphere, weather maps, high and low pressure systems, air masses, cold and warm fronts, atmospheric circulation, storms and world weather patterns. Discussion of past and present world climates. Reading meteorological instruments, weather analysis and forecasting will be included.

**Course Rotation:** NYC: Fall, Spring, and Summer. PLV: Fall and Spring.

**Prerequisites:** This course does not have a prerequisite.

SCI 170 Oceanography (0-3 credits)

A descriptive course entailing study of the oceans and their topography, geology, and geophysics; physical and chemical properties of seawater, ocean currents, tides, and shoreline processes; marine organisms and their ecology; survey of oceanographic instruments and techniques.

**Course Rotation:** NYC: Fall, Spring, and Summer. PLV: Fall and Spring.

**Prerequisites:** This course does not have a prerequisite.

SCI 171 Coastal Oceanography (3 credits)

An introduction to the scientific study of the coastal environment. Discussion of forces which help to shape the shoreline, including waves, tides, and surf. Topics also include beach and shoreline features, shore ecology, and the role of man. An all-day field trip is included.

**Course Rotation:** NYC: Spring.

**Prerequisites:** This course does not have a prerequisite.

SCI 180 Fundamentals of Technology (3 credits)

**Prerequisites:** This course does not have a prerequisite.

SCI 196A Topic: The Music and Expression of Sound (0-4 credits)

SCI 199C Topic: Technology (3 credits)

SCI 199N Topic: Technology (3 credits)

SCI 199S Topic in Physical Science: Rocks, Minerals, and Gems (3 credits)

SCI 199T Topic: Geology of the National Parks (3 credits)

SCI 199V Topic: Concepts of Earth Science and Chemistry (3 credits)

SCI 226 Geographical Information Systems (3 credits)

Students will be taught to visualize, explore, query and analyze geographic data. The popular desktop GIS program arcview will be used.

**Course Rotation:** NYC: Spring, PLV: Spring.

**Prerequisites:** This course does not have a prerequisite.

SCI 230 Environmental Science (4 credits)

This course is for students who have a high interest in the environment, but little background in science. Through readings, online discussions, videos and reading The New York Times, the students will gain an understanding of the science behind environmental topics in the news. Exercises to conduct in their backyard or community will reinforce the relevance of assigned readings. After successfully completing this course, the students will be able to describe and explain the major environmental issues in the public forum. Each student, through examining their own contribution to environmental problems, should be able to map their own path towards creating a sustainable lifestyle.

**Prerequisites:** This course does not have a prerequisite.

SCI 240 Physical Geology (3 credits)

An introductory course including topics in structural geology and geomorphology. Topics will include geologic time, crustal deformation, mountain building, weathering, erosion and mass wasting. The work of streams, ground water, wind, glacial ice, waves, and coastal currents will also be considered. An introduction to the interpretation of topographic maps and aerial photos will also be part of the course. A field trip or museum visit will be included.

**Course Rotation:** Spring.

**Prerequisites:** SCI 101 with a minimum grade of D.

SCI 243 Historical Geology (3 credits)

An introduction to the history of the earth. Topics include origin of the earth, geologic time, development and interpretation of ancient environments, geologic principles, evolution, fossil organisms and survey of geologic history of North America.

**Course Rotation:** NYC: Spring - Odd years. PLV: Fall.

**Prerequisites:** This course does not have a prerequisite.

SCI 270 Observational Astronomy (3 credits)

This class is designed to be 50% Lecture and 50% Observational. Each week there will be telescope work outdoors. There will be observing projects that will be done in groups. Reports will be written.

**Course Rotation:** Spring:PLV

**Prerequisites:** This course does not have a prerequisite.

SCI 296A Topic: How Competitive Technology Works (3 credits)

SCI 296C Topic: Our Geological World (3 credits)

SCI 296D Physical World and Philosophy of Science (3 credits)

SCI 296E Topic: Introductory Earth Science (3 credits)

SCI 296F Climatology (3 credits)

Scientific principles applied to the study, the analysis and the interpretation of climates and climatic changes. Topics will include: The atmospheric environment and the impact of weather and climate on economic and ecological systems; The world distribution of climatic elements; Methods of arranging climatic data; Climatic classifications and world distribution of climatic types; General circulation; Climatic change and climatic fluctuations.

**Prerequisites:** This course does not have a prerequisite.

SCI 296G Topic: Weather Forecasting and Analysis (3 credits)

This course will focus on the analysis of National Weather Services products and Forecast Models. Students will learn the various procedures and techniques used in constructing short-range and medium range weather forecasts. Materials will come from the MWS and include: Satellite and Radar imagery, Surface Weather Maps, Upper Air Charts, Skew-T Diagrams, Temperature Progs, Quantitative Precipitation Forecast Charts and the GFS Forecast Model. Students will also work on the preparation and delivery of radio weather reports.

**Prerequisites:** SCI 160 with a minimum grade of D.

SCI 296H Topics in Science: Introduction to the Science of Air Pollution (3 credits)

This course is an introduction to air quality science, including current topics in the news involving public exposure to air toxics, adverse health effects particularly affecting the very young and old, industrial emissions, proposed regulations to combat these environmental problems, and climate change and greenhouse gases. Topics cover what are air pollutants, their regulation and control, how the public is exposed to them, public health and other effects, and what can be done to reduce such effects.

**Course Rotation:** PLV:Spring

**Prerequisites:** CHE 101 or CHE 111 or CHE 110 or ENV 222 with a minimum grade of D.

SCI 345 Environmental Applications in Geology (0-4 credits)

An investigation of the relationships between man and his geological environment. Discussion of population, hydrology, mineral resources, fossil fuels, geologic hazards, mining, construction and land uses. Practical experiences in topographic map interpretation. Restrictions/Requirements: Junior standing and a minimum cqpa of 3.00

**Course Rotation:** PLV: Fall; Even years

**Prerequisites:** CHE 110 or SCI 101 or ENV 222 or CHE 111 with a minimum grade of D.

SCI 395 Independent Study in Physical Science (1-9 credits)

With the approval of an appropriate faculty member, the department chairperson, and the academic dean, students may select a topic for guided research that is not included in the regular course offerings. The student meets regularly with the faculty member to review progress. A research project or paper must also be submitted. Requirement/Restriction: Junior standing and a minimum of CQPA of 3.00.

**Prerequisites:** This course does not have a prerequisite.

SCI 395A Independent Study in Physical Science (A) (1-9 credits)

SCI 395B Independent Study in Physical Science (B) (1-9 credits)

SCI 395C Independent Study in Physical Science (C) (1-9 credits)

SCI 396 Topics in Physical Science (3 credits)

SCI 396A Topic: How Competitive Technology Works (3 credits)

SCI 480 Research in Physical Science (3 credits)