

SCIENCE (SCI)

SCI 1100 Introduction to Chemistry for Liberal Studies (2)

This course provides an introduction to basic chemical principles. Topics include: chemical and physical properties, the Periodic Table of Elements, atomic and molecular structure, nuclear chemistry, and forms of matter and energy. Prerequisites: QR1 or QR2 in Mathematics or completion of MATH 2120 with a grade of C-. Open only to majors in Liberal Studies. 100 minutes of activity and 150 minutes of laboratory per week.

Requisite(s): Prerequisites: QR1 or QR2 in Mathematics or completion of MATH 2120 with a grade of C-. Open only to majors in Liberal Studies.

Typically Offered: Fall, Spring

Course Fee: Yes

SCI 1600 Physics for Liberal Studies (3)

Introduction to various fundamental principles of physics. Topics to be covered include classical mechanics, thermodynamics, electricity and magnetism, waves and light, an basic nuclear physics principle. 150 minutes of lecture/discussion per week. Prerequisites: QR1 or QR2 in Mathematics or MATH 2120 with a grade of C- or better. Open only to majors in Liberal Studies.

Requisite(s): Prerequisites: QR1 or QR2 in Mathematics or MATH 2120 with a grade of C- or better.

Typically Offered: Fall, Spring

SCI 2770 Special Topics in Science (1-4)

Topics and prerequisites to be announced. May be repeated with different topics up to a maximum of 9 units.

Repeatable for Credit: Yes, up to 9 units

SCI 3109 The Science of Food (3)

The nature and application of science and technology and its impact on quality of life will be explored using food as an example. This includes considering the chemistry, biochemistry, biology, biotechnology, microbiology, and physics of food as well as nutrition and toxicology considerations. Prerequisites: At least 45 units and completion of LD Area B. This course satisfies the following components of the CSUB GE Program: upper division Area UDB, Theme Q: Quality of Life, quantitative reasoning and written communication reinforcement.

Requisite(s): Prerequisites: At least 45 units and completion of LD Area B.

General Education Attribute(s): Theme Q: Quality of Life, Upper Division B

SCI 3119 Revolutionary Ideas in Chemistry (3)

This course is a survey of chemical history from the early Renaissance period to the present including some philosophical analysis of those historical developments. Our main focus will be on understanding how past chemists thought about and understood the world around them and how they used this understanding to develop new (although not necessarily correct) theories and practical methods. Attention will also be paid to the practical applications of chemistry and the broader social, economic and cultural contexts in which chemistry developed, as well as its relation to other fields such as physics, biology and medicine. Prerequisites: At least 45 units and completion of LD Area B. This course satisfies the following components of the CSUB GE Program: upper division Area UDB, Theme R: Revolutionary Ideas and Innovations, quantitative reasoning and written communication reinforcement.

Requisite(s): Prerequisites: At least 45 units and completion of LD Area B.

General Education Attribute(s): Theme R: Rev Ideas & Innovatns, Upper Division B

SCI 3129 Environmental Chemistry and Sustainability (3)

This course deals with sustainability as defined by the 1987 Brundtland Report of the United Nations as "sustainable development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This theme will be explored by discussing topics such as atmospheric chemistry and air pollution, energy production and climate change, toxic organic compounds, water chemistry and water pollution, as well as metal, soil, sediments and waste disposal. Prerequisites: At least 45 units and completion of LD Area B. This course satisfies the following components of the CSUB GE Program: upper division Area UDB, Theme S: Sustainability and Justice, quantitative reasoning and oral communication reinforcement.

Requisite(s): Prerequisites: At least 45 units and completion of LD Area B.

General Education Attribute(s): Theme S: Sustainability & Just, Upper Division B

SCI 3209 Computers and Society (3)

This course will provide a framework for examining the social context and consequences of information technology. Society, social change, and effects on the individual related to the use of computers will be the major concentrations. Emphases will include values, ethics, patterns, future directions, and relevant theories related to these phenomena. Course meets for 150 minutes of lecture each week. Prerequisites: At least 45 units and completion of LD Area B. Satisfies general education upper division Area UDB and Theme R: Revolutionary Ideas and Innovations.

Requisite(s): Prerequisites: At least 45 units and completion of LD Area B.

General Education Attribute(s): Theme R: Rev Ideas & Innovatns, Upper Division B

SCI 3210 Fab Lab Teaching Internship (4)

Fab lab teaching internship. The objective of this course is to familiarize the student with the Fab Lab. The student will perform an internship during the course in this laboratory. Fab Lab interns will be part-time support staff in the Fab Lab. Their responsibilities include supporting existing and new programs, as well as general lab operations. This will include general technical and logistical support as well as monitoring activities at all times to ensure safe operation. Additionally, lab interns will have a general project encompassing the full semester. This project will be assigned in collaboration with the student, faculty advisor and supervisor. It will be something relevant to the major field of study, support lab operations and be of interest to the student. Prerequisites: PHYS 2120 or PHYS 2230. Open only to students in the Natural Sciences Major.

Requisite(s): Prerequisites: PHYS 2120 or PHYS 2230. Open only to students in the Natural Sciences Major.

SCI 3609 An Introduction to the Modern Cosmos (3) 

This course is a survey of basic concepts in modern cosmology, and how these fundamental ideas have changed the way in which people have thought about the world in which they live. The class starts with a brief historical overview of influential thoughts which have led the field from ancient beliefs and views to Newton's discoveries in the 1600s. The class further covers background material relating to the formation and lives of stars. Gravitation, Special, and General Relativity are then explored in broad terms. Topics of special interest are also discussed such as relevant experimental observations, the nature of space-time, and theoretical predictions such as black holes, gravitational waves, and dark energy and inflation. This course may not be used to satisfy physics major or minor requirements. 150 minutes lecture. Prerequisites: At least 45 units and completion of LD Area B. Satisfies general education upper division Area UDB and Theme R: Revolutionary Ideas and Innovations.

Requisite(s): Prerequisites: At least 45 units and completion of LD Area B.

General Education Attribute(s): Theme R: Rev Ideas & Innovatns, Upper Division B

Typically Offered: Fall, Spring

SCI 3610 Energy and Technology (3)

Energy in a technological society. Sources and resources of energy. Effects of energy on the environment. This course may not be used to satisfy physics major or minor requirements. Prerequisites: Successful completion of General Education Areas A and B. GE T1

Typically Offered: Spring

SCI 3639 Introduction to Weather Dynamics (3) 

This is an introductory course with a large on-line component on the fundamentals of atmospheric science. Current weather data are accessed via the Internet, and learning activities are keyed to the day's weather. General topics are studied such as how one characterizes various phenomena and meteorological effects, and how these are measured. This course may not be used to satisfy physics major or minor requirements. 150 minutes lecture/discussion per week. Prerequisites: At least 45 units and completion of LD Area B. Satisfies general education upper division Area UDB and Theme S: Sustainability and Justice.

Requisite(s): Prerequisites: At least 45 units and completion of LD Area B.

General Education Attribute(s): Theme S: Sustainability & Just, Upper Division B

Course Fee: Yes

SCI 4118 Senior Seminar in Science Teaching (2) 

Student presentations and discussions of science content, lessons and lab activities relevant to the middle school science audience. 2-hour discussion per week. Prerequisites: At least 90 units, completion of JYDR; and open only to individuals pursuing the foundational science concentration in the BS in Natural Sciences. Satisfies general education requirement Senior Capstone.

Requisite(s): Prerequisite: At least 90 units, completion of JYDR; and open only to individuals pursuing the foundational science concentration in the BS in Natural Sciences.

General Education Attribute(s): Capstone

SCI 5200 Computational Thinking (3)

A graduate level course offered in an online format that satisfies the Computational Thinking requirement for an Introductory Supplementary Authorization in Computer Science. Topics include solving problems and designing systems using fundamental computing concepts such as decomposition, data representation, generalization/abstraction and algorithms. Students will learn effective computational thinking and programming techniques for the classroom through study of historically significant works, conducting literature search in methods/case studies, and critical discussion in seminar setting. Each week meets for 150 minutes of lecture.

Typically Offered: Spring

SCI 5210 Computing Practice and Programming (3)

A graduate level course in an online format that satisfies the Computing Practice and Programming requirement for an Introductory Supplementary Authorization in Computer Science. This course has two objectives. First, exposure to a high-level, modern programming language. Students develop programming skills by completing lab activities in expressions, control of flow, functions, lists, arrays, strings and automation of common computing tasks. Second, to demonstrate expertise in a block programming language. Through study of a current block programming language students will understand effective ways and mediums to teach programming in the classroom. Prerequisites: grade of C- or better in SCI 5200. Each week meets for 150 minutes of lecture.

Requisite(s): Prerequisites: grade of C- or better in SCI 5200.

Typically Offered: Summer

SCI 5220 Computers and Communication Devices (3)

A graduate level course in a hybrid format that satisfies the Computers and Communication Devices requirement for an Introductory Supplementary Authorization in Computer Science. Students will learn about the major components and functions of digital devices, the computing systems they compose, and communication on an embedded computing platform designed for education. Through interactive design activities students will learn methods that can be practically applied in the classroom. The class culminates in a physical presentation of a lesson plan with tinkering and embedded computing devices to demonstrate expertise in digital devices. Prerequisite: grade of C- or better in SCI 5200. Each week meets for 150 minutes of lecture.

Requisite(s): Prerequisites: grade of C- or better in SCI 5200.

Typically Offered: Summer

SCI 5230 Impacts of Computing (3)

A graduate level course in an online format that satisfies the Impacts of Computing requirement for an Introductory Supplementary Authorization in Computer Science. Topics include social, ethical and legal issues and impacts of computing as well as the contributions of computer science to current and future innovations in the arts, business, humanities, medicine and science. Students develop competency through critical discussion and debate in a seminar style setting. Prerequisites: grade of C- or better in SCI 5200. Each week meets for 150 minutes of lecture.

Requisite(s): Prerequisites: grade of C- or better in SCI 5200.

Typically Offered: Summer

SCI 6901 Project in Science Education (2-6)

Project Students complete a project in the field of science education that requires an appropriateness of topic, theory and methods applicable to the nature of the degree, conducted under supervision of the graduate advisor and committee. May be repeated for credit up to a maximum of 6 units.

Repeatable for Credit: Yes, up to 6 units