

# SCIENCE (SCI)

## SCI 100 Science and Math Concepts (Unit: 1)

Prerequisite: Concurrent enrollment in the appropriate parent course based on the topic.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in the designated parent course. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units.

Activity. (ABC/NC grading; CR/NC allowed)

### Topics:

- Science Concepts: Programming Methodology
- Science Concepts: Physics with Calculus III
- Science Concepts: Linear Systems Analysis
- Science Concepts: Mechanics of Solids
- Science Concepts: Electromechanical Systems

## SCI 101 First-Year Experience in Science and Engineering (Units: 3)

Prerequisite: GE Area A2\*.

A writing-intensive first-year experience course that develops identity as a scientist through a semester-long inquiry project. Using case studies students will engage in ethical issues in science and technology and explore social justice concepts as they relate to science; learn how scientists develop and support their theories; develop writing skills in the sciences in a variety of formats including essays, reviews, a podcast, and a poster presentation. (Plus-minus letter grade only)

### Course Attributes:

- E: Lifelong Learning Develop

### Topics:

- Science or Fiction: How Scientists Discern Truth

## SCI 110 Science Concepts: Human Biology (Unit: 1)

Prerequisite: Concurrent enrollment in BIOL 100.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in BIOL 100. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. (Plus-minus ABC/NC grading, CR/NC allowed)

## SCI 111 Science Concepts: Physics I (Unit: 1)

Prerequisite: Concurrent enrollment in PHYS 111.

Student-centered discussion and problem-solving section. Designed to promote understanding of key concepts and enhance student success in PHYS 111. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

## SCI 111Z Science Concepts: Physics I (Unit: 1)

Prerequisite: Concurrent enrollment in PHYS 111.

Designed to promote understanding of key concepts and enhance student success in PHYS 111 by reviewing the key concepts offered in lectures, student-centered discussion, and problem-solving. May be repeated for a total of 4 units.

## SCI 115 Science Concepts: Chemistry I (Unit: 1)

Prerequisite: Concurrent enrollment in CHEM 115.

Student-centered discussion and problem-solving. Designed to promote understanding of key concepts and enhance student success in CHEM 115. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

## SCI 121 Science Concepts: Physics II (Unit: 1)

Prerequisite: Concurrent enrollment in PHYS 121.

Student-centered discussion and problem-solving section. Designed to promote understanding of key concepts and enhance student success in PHYS 121. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

## SCI 121Z Science Concepts: General Physics II (Unit: 1)

Prerequisite: Concurrent enrollment in PHYS 121.

Designed to promote understanding of key concepts and enhance student success in PHYS 121 by reviewing the key concepts offered in lectures, student-centered discussion, and problem-solving. May be repeated for a total of 4 units.

## SCI 124 Mathematics Concepts: Elementary Statistics (Unit: 1)

Prerequisite: Concurrent enrollment in MATH 124.

Student-centered discussion and problem-solving. Designed to promote understanding of key concepts and enhance student success in MATH 124. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC, CR/NC grading option)

## SCI 180 Science Concepts: Chemistry for Energy and the Environment (Unit: 1)

Prerequisite: Concurrent enrollment in CHEM 180.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in CHEM 180. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

## SCI 199 Mathematics Concepts: Pre-Calculus (Unit: 1)

Prerequisite: Concurrent enrollment in MATH 199.

Student-centered discussion and problem-solving section. Designed to promote understanding of key concepts and enhance student success in MATH 199. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

## SCI 205 Science Concepts: Electric Circuits (Unit: 1)

Prerequisites: PHYS 230; concurrent enrollment in ENGR 205.

Student-centered discussion and problem-solving designed to promote understanding of key concepts of circuit analysis and enhance student success in ENGR 205. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 210 Science Concepts: General Microbiology and Public Health (Unit: 1)**

Prerequisite: Concurrent enrollment in BIOL 210.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in BIOL 210. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 215 Science Concepts: Chemistry II (Unit: 1)**

Prerequisites: Concurrent enrollment in CHEM 215. CHEM 115\*.

Student-centered discussion and problem-solving. Designed to promote understanding of key concepts and enhance student success in CHEM 215. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 215Z Science Concepts: General Chemistry II (Unit: 1)**

Prerequisite: Concurrent enrollment in CHEM 215.

Designed to promote understanding of key concepts and enhance student success in CHEM 215 by reviewing the key concepts offered in lectures, student-centered discussion, and problem-solving. May be repeated for a total of 4 units.

**SCI 220 Science Concepts: Physics with Calculus I (Unit: 1)**

Prerequisite: Concurrent enrollment in PHYS 220.

Designed to promote understanding of key concepts and enhance student success in PHYS 220. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 221 Science Concepts: Data Structures (Unit: 1)**

Prerequisite: Concurrent enrollment in CSC 220.

Designed to promote understanding of key concepts and enhance student success in CSC 220. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 226 Mathematics Concepts: Calculus I (Unit: 1)**

Prerequisite: Concurrent enrollment in MATH 226.

Student-centered discussion and problem-solving section. Designed to promote understanding of key concepts and enhance student success in MATH 226. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 226Z Mathematics Concepts: Calculus I (Unit: 1)**

Prerequisite: Concurrent enrollment in MATH 226.

Designed to promote understanding of key concepts and enhance student success in MATH 226 by reviewing the key concepts offered in the lectures, student-centered discussion, and problem-solving. May be repeated for a total of 4 units.

**SCI 227 Mathematics Concepts: Calculus II (Unit: 1)**

Prerequisite: Concurrent enrollment in MATH 227.

Student-centered discussion and problem-solving section. Designed to promote understanding of key concepts and enhance student success in MATH 227. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 228 Mathematics Concepts: Calculus III (Unit: 1)**

Prerequisite: Concurrent enrollment in MATH 228.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in MATH 228. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 230 Science Concepts: Biology I (Unit: 1)**

Prerequisite: Concurrent enrollment in BIOL 230.

Student-centered discussion and problem-solving. Designed to promote understanding of key concepts and enhance student success in BIOL 230. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (ABC/NC grading; CR/NC allowed)

**SCI 230Z Science Concepts: Biology I (Unit: 1)**

Prerequisite: Concurrent enrollment in BIOL 230.

Designed to promote understanding of key concepts and enhance student success in BIOL 230 by reviewing the key concepts offered in lectures, student-centered discussion, and problem-solving.

**SCI 234 Science Concepts: Physics with Calculus II (Unit: 1)**

Prerequisites: PHYS 220 and MATH 227; concurrent enrollment in PHYS 230 and PHYS 232.

Student-centered discussion and problem-solving. Designed to promote understanding of key concepts of electromagnetism and enhance student success in PHYS 230. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 235 Science Concepts (Units: 2)**

Prerequisite: Concurrent enrollment in BIOL 230 or BIOL 240, CHEM 115 or CHEM 215. Preference is given to students in the Health Career Opportunity Program.

Designed to enhance student success in introductory biology and chemistry courses by emphasizing problem-solving and scientific writing skills. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units.

**SCI 239 Introduction to Health Professions (Units: 2)**

Introduction to the broad array of health professions, helping students make a more informed health career choice. Activities include talks from guest speakers representing various health professions, small group activities, and student projects. Intended for freshmen and sophomores.

**SCI 240 Science Concepts: Biology II (Unit: 1)**

Prerequisite: Concurrent enrollment in BIOL 240.

Student-centered discussion and problem-solving. Designed to promote understanding of key concepts and enhance student success in BIOL 240. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 240Z Science Concepts: Biology II (Unit: 1)**

Prerequisite: Concurrent enrollment in BIOL 240.

Designed to promote understanding of key concepts and enhance student success in BIOL 240 by reviewing key concepts from the lectures, student-centered discussion, and problem-solving.

**SCI 244 Science Concepts: Physics with Calculus III (Unit: 1)**

Prerequisite: Concurrent enrollment in PHYS 240.

Student-centered discussion and problem-solving. Designed to promote understanding of key concepts of electromagnetism and enhance student success in PHYS 240. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 305 Science Concepts: Linear Systems Analysis (Unit: 1)**

Prerequisites: Concurrent enrollment in ENGR 305. ENGR 205\* with a grade of C- or better and MATH 245\* or equivalent.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in the designated parent course. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 321 Science Concepts: Quantitative Analysis (Unit: 1)**

Prerequisites: Concurrent enrollment in CHEM 321. CHEM 215\* with a grade of C or better.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in CHEM 321. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 328 Science Concepts: Human Anatomy (Unit: 1)**

Prerequisites: A college course in biology; concurrent enrollment in BIOL 328.

Student-centered discussion and problem-solving. Designed to promote understanding of key concepts and enhance student success in BIOL 328. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. (Plus-minus ABC/NC grading only)

**SCI 328Z Science Concepts: Human Anatomy (Unit: 1)**

Prerequisite: Concurrent enrollment in BIOL 328.

Designed to promote understanding of key concepts and enhance student success in BIOL 328 by reviewing the key concepts offered in lectures, student-centered discussion, and problem-solving. May be repeated for a total of 4 units.

**SCI 333 Science Concepts: Organic Chemistry I (Unit: 1)**

Prerequisites: Concurrent enrollment in CHEM 233. CHEM 215\* with grades of C or better.

Student-centered discussion and problem-solving section. Designed to promote understanding of key concepts and enhance student success in CHEM 333. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 333Z Science Concepts: Organic Chemistry I (Unit: 1)**

Prerequisite: Concurrent enrollment in CHEM 233.

Designed to promote understanding of key concepts and enhance student success in CHEM 233 by reviewing the key concepts offered in lectures, student-centered discussion, and problem-solving. May be repeated for a total of 4 units.

**SCI 335 Science Concepts: Organic Chemistry II (Unit: 1)**

Prerequisites: Concurrent enrollment in CHEM 335. CHEM 233\* with a grade of C or better.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in CHEM 335. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 335Z Science Concepts: Organic Chemistry II (Unit: 1)**

Prerequisite: Concurrent enrollment in CHEM 335.

Designed to promote understanding of key concepts and enhance student success in CHEM 335 by reviewing the key concepts offered in lectures, student-centered discussion, and problem-solving. May be repeated for a total of 4 units.

**SCI 350 Science Concepts: Cell Biology (Unit: 1)**

Prerequisite: Concurrent enrollment in BIOL 350.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in BIOL 350. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. Activity. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 403 Climate Change Science for Educators (Units: 3)**

Prerequisite: Enrollment in Graduate Certificate in PreK-12 Climate Justice Education.

An investigation of the science behind climate change causes, impacts, and solutions. Discussions of Earth's energy budget and the interplay between Earth's surface, its atmosphere, its oceans, the Sun, and human civilization. Emphasis on the pedagogy of these scientific concepts. Designed for K-12 teachers.

**SCI 499 Culminating Experience Continuous Enrollment (Unit: 0)****SCI 560GW Science Writing - GWAR (Units: 3)**

Prerequisite: GE Area A2.

Principles of research, writing, and editing of technical documents and articles for the public understanding of science. Students write publication-quality articles for possible inclusion in *Intersci*, the journal of the College of Science and Engineering. (Plus-minus ABC/NC grading only)

**Course Attributes:**

- Graduation Writing Assessment

**SCI 610 Science Concepts: Principles of Human Physiology (Unit: 1)**

Prerequisites: BIOL 328; CHEM 101; concurrent enrollment in BIOL 212; or permission of the instructor.

Student-centered discussion and problem-solving section. Designed to promote understanding of key concepts and enhance student success in BIOL 212. SCI 235, Science Concepts, and Mathematics Concepts courses may be repeated for a combined total of 4 units. (Plus-minus ABC/NC grading, CR/NC allowed)

**SCI 614 Graduate Writing Skills (Units: 3)**

Prerequisite: Graduate standing. Enrollment priority given to College of Science and Engineering students.

Designed to increase the writing proficiency of graduate students. May not be used to meet MS ATC requirements. (CR/NC grading only)

**SCI 687 Experiences in Supplemental Instruction (Units: 2)**

Prerequisite: PHYS 685 (may be taken concurrently).

Practicum for students who want to become Supplemental Instruction (SI) Facilitators in the College of Science and Engineering. Activity.

**SCI 693 Cooperative Education Program (Units: 1-12)**

Prerequisite: Permission of the instructor.

Supervised employment in academically relevant fields of study. Objectives are career development, occupational experience, and educational subsidy. Contact the Cooperative Education Office for more information. May be repeated for a total of 24 units with permission of major adviser.

**SCI 695 Health Professions Colloquium (Units: 2)**

Prerequisites: BIOL 230/BIOL 240, CHEM 115/CHEM 215.

Preference given to students in Health Career Opportunity Program. Designed to prepare juniors and seniors for successful application to health professions schools. Application preparation, mock interviews, standard test preparation, oral presentations of journal articles. May be repeated for a total of 4 units.

**SCI 698 Strategies for Successful Graduate Applications in STEM (Units: 2)**

Prerequisite: Senior standing and permission of the instructor.

Introduction to graduate research skills, including written and oral communication, equity in science, reading and analyzing research, responsible conduct in research, and rigor and responsibility in STEM. May be repeated for a total of 4 units.

(This course is offered as BIOL 698 and SCI 698. Students may not repeat the course under an alternate prefix.)

**Topics:**

- a. Developing a Scientific Identity
- b. Skills to Succeed as a Scientist
- c. Developing a Strong Doctoral Application Package
- d. Careers with a Doctoral Degree

**SCI 701 Strategies for Successful PhD Applications in STEM (Units: 2)**

Prerequisite: Graduate standing and permission of the instructor.

Introduction to graduate research skills, including written and oral communication, equity in science, reading and analyzing research, responsible conduct in research, and rigor and responsibility in STEM. May be repeated for a total of 8 units.

(This course is offered as BIOL 701 and SCI 701. Students may not repeat the course under an alternate prefix.)

**Topics:**

- a. Introduction to Graduate Skills
- b. Developing Skills Towards the MS Degree
- c. Preparation for PhD Applications
- d. Careers After a Doctoral Degree

**SCI 719 Exploring and Practicing Science Communication (Units: 2)**

Prerequisite: Graduate standing or permission of the instructor.

Communicating about science is a natural part of any scientist's life. Delve into what others have learned about science communication, experiment with tools that communicate work and goals, and develop skills to engage a broad range of people in how science is relevant and important.

(This course is offered as BIOL 719 and SCI 719. Students may not repeat the course under an alternate prefix.)

**SCI 750 Science Teaching for Scientists I (Units: 2)**

Prerequisite: Graduate standing or permission of the instructor.

Introduction to practical teaching strategies, science education theory and research, and scientific teaching to SF State graduate students who are teaching science in a variety of contexts. May be repeated for a total of 4 units. (Plus-minus letter grade only)

(This course is offered as SCI 750 and BIOL 750. Students may not repeat the course under an alternate prefix.)

**SCI 793 Cooperative Education Program (Units: 1-3)**

Prerequisites: Graduate standing and permission of the instructor.

Supervised employment in academically relevant fields of study. Objectives are career development, occupational experience, and educational subsidy. Contact the Cooperative Education Office for more information. May be repeated for a total of 3 units.