NATURAL SCIENCES-NSCI (NSCI)

Courses

NSCI 170 Perspectives and Communication in Science  Credit: 1 (1-0-0)
Course Description: Exploration of personal stories and development as
science students through writing assignments, dialogue, and outreach
activities. Topics will include effective communication of science
principles with a variety of audiences (including K-12) and a diverse group
of learners, exploration of how experiences and perspectives affect how
individuals perceive and influence the scientific process and learning
science concepts.
Prerequisite: None.
Restriction: Must be a: Undergraduate.
Registration Information: Written consent of instructor. Credit not
allowed for both NSCI 170 and NSCI 180A2.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 192 Introductory Seminar  Credits: 2 (0-0-2)
Course Description: Introduction to the culture and values of science and
the College of Natural Sciences.
Prerequisite: None.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 193 College of Natural Sciences Career Seminar  Credit: 1 (0-0-1)
Course Description: Guidance for students in exploring who they are
individually, how they might fit into a career or a graduate program
in the sciences, how to develop their career path to be competitive in
the selection process, and preparation of their marketing materials to
be used in the future. Helps students gain a better understanding of
their individual abilities, strengths, and interests imperative to being
successful in a career search.
Prerequisite: None.
Restriction: Must be a: Undergraduate.
Registration Information: Undergraduate majors in the College of Natural
Sciences only. This is a partial semester course. Credit not allowed for
both NSCI 181A1 and NSCI 193.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 195 Independent Study-Natural Sciences  Credits: Var[1-3] (0-0-0)
Course Description: None.
Prerequisite: None.
Registration Information: Written consent of instructor. Credit not
allowed for both NSCI 170 and NSCI 180A2.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 295 Undergraduate Research-Natural Sciences  Credits: Var[1-3] (0-0-0)
Course Description: None.
Prerequisite: None.
Registration Information: Written consent of Natural Sciences Dean’s
Office required.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

NSCI 296 Group Study-Natural Sciences  Credits: Var[1-3] (0-0-0)
Course Description: None.
Prerequisite: None.
Registration Information: Written consent of Natural Sciences Dean’s
Office required.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.
NSCI 575 Ethical Issues in Big Data Research  Credit: 1 (1-0-0)
Course Description: Examines big data research through an applied interdisciplinary approach to ethical issues surrounding collection, use, reporting, and preservation of big data. Incorporates a range of transferable skills training, so students are well equipped to engage in and lead data-centric research within or outside academia.
Prerequisite: None.
Registration Information: Senior standing. This is a partial semester course. Credit not allowed for NSCI 575 and NSCI 580A2.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 579 Animal Behavior in Captive Populations  Credits: 3 (3-0-0)
Also Offered As: VS 579.
Course Description: How animals learn, perceive their work, and behave, and how all of those intersect to alter behavior in captive settings.
Prerequisite: BZ 300.
Registration Information: Enrollment in the M.P.N.S., Zoo, Aquarium, and Shelter Management specialization can be used in place of BZ 300. Credit not allowed for both NSCI 579 and VS 579.
Term Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 590A Workshop in Instruction: Science Instruction in Rural Colorado  Credits: Var[1-3] (0-0-0)
Course Description: How animals learn, perceive their work, and behave, and how all of those intersect to alter behavior in captive settings.
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

NSCI 590B Workshop in Instruction: Mathematics Instruction in Rural Colorado  Credits: Var[1-3] (0-0-0)
Course Description: How animals learn, perceive their work, and behave, and how all of those intersect to alter behavior in captive settings.
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

NSCI 590C Workshop in Instruction: Small Scale Science-Teachers as Researchers  Credits: 4 (2-4-0)
Course Description: How animals learn, perceive their work, and behave, and how all of those intersect to alter behavior in captive settings.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

NSCI 590D Workshop in Instruction: Colorado Science Teacher Enhancement Project  Credits: 7 (0-0-7)
Course Description: How animals learn, perceive their work, and behave, and how all of those intersect to alter behavior in captive settings.
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

NSCI 590E Workshop in Instruction: Summer Mathematics  Credits: 3 (0-0-3)
Course Description: How animals learn, perceive their work, and behave, and how all of those intersect to alter behavior in captive settings.
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

NSCI 590G Workshop in Instruction, Small Scale Chemistry  Credits: 2 (1-2-0)
Course Description: How animals learn, perceive their work, and behave, and how all of those intersect to alter behavior in captive settings.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

NSCI 596 Small Scale Science Group Study  Credits: Var[1-3] (0-0-0)
Also Offered As: PHIL 601.
Course Description: How animals learn, perceive their work, and behave, and how all of those intersect to alter behavior in captive settings.
Prerequisite: None.
Term Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

NSCI 601 Master of Profess. Natural Sciences Ethics  Credit: 1 (0-0-1)
Also Offered As: PHIL 601.
Course Description: Ethical issues involving the care and treatment of animals in captive environments. Lectures, case studies, discussions, and student presentations.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Enrollment in the Master of Professional Natural Sciences program. Credit not allowed for both NSCI 601 and PHIL 601. This is a partial-semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 610 Team Research in Quantitative Ecology  Credits: 3 (2-2-0)
Course Description: Interdisciplinary team-based research aimed at studying real-life models in quantitative ecology using mathematical and statistical tools.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of instructor. Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 611 Leadership in Animal Organizations  Credits: 3 (3-0-0)
Course Description: Management training and specific leadership tools aimed at future professionals leading an animal organization.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission in the PSM program. All PSM students will need to register for the first fall semester to complete the course as a cohort class. Sections may be offered: Online. Credit not allowed for both NSCI 611 and NSCI 680A3.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
NSCI 612 Myth Busters – Science/Controversy/Evaluation Credits: 3 (3-0-0)
Course Description: Development and practice of western science; understanding how conflicts between science and culture create controversy; and evaluating claims.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Enrollment in MNSE programs. Written consent of instructor. Offered as an online course only.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 619A Physics for Educators: Optics Credits: 3 (3-0-0)
Course Description: Ray, wave, and particle models of light, with diverse applications. Introduction to special relativity and quantum physics via light. Includes regular at-home, hands-on activities.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to MNSE program. Offered as an online course only. Credit not allowed for both NSCI 619 and NSCI 619A.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 619B Physics for Educators: Mechanics Credits: 3 (3-0-0)
Course Description: Classical kinematics and dynamics, with particular attention to phenomena that can be explored using an integrated sensor system for weekly at-home labs.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to MNSE program. Offered as an online course only. Credit not allowed for both NSCI 619B and NSCI 680A5.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 620 Chemistry for Science Educators Credits: 3 (0-0-3)
Course Description: Theoretical and experimental chemistry for grade 6-12 science teachers, with emphasis on water chemistry.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to the Master of Professional Natural Sciences program. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 630 Spectroscopy for Science Educators Credits: 3 (0-0-3)
Course Description: Theory and applications of spectroscopy for grade 6-12 science teachers.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to the Master of Professional Natural Sciences program. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 631 Marketing for Animal Organizations Credits: 3 (3-0-0)
Course Description: Marketing skills designed to meet the needs of animal professionals.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to the PSM program. Sections may be offered: Online. Credit not allowed for both NSCI 631 and NSCI 680A4.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 630 Pollution and Environmental Biology for Educators Credits: 3 (0-0-3)
Course Description: Biological consequences of energy production and consumption for grade 6-12 science teachers.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to the Master of Professional Natural Sciences program. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 640 Energetics for Science Educators Credits: 3 (0-0-3)
Course Description: Production and use of energy for grade 6-12 science teachers, with emphasis on chemical and biological systems.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to the Master of Professional Natural Sciences program. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 650 Pollution and Environmental Biology for Educators Credits: 3 (0-0-3)
Course Description: Biological consequences of energy production and consumption for grade 6-12 science teachers.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to the Master of Professional Natural Sciences program. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 660 Evolutionary Biology for Educators Credits: 3 (0-0-3)
Course Description: Evolutionary theory, with an emphasis on innovative methods for teaching evolutionary biology in grades 6-12.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to Master of Natural Sciences Education (M.N.S.E.) degree program. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.
NSCI 670  Earth Sciences for Educators  Credits: 3 (3-0-0)
Course Description: Provides a foundation in the Earth Sciences for secondary science teachers, emphasizing their societal relevance and context. Topics include earth science methods and thinking, plate tectonics, minerals and mineral resources, rock formation and identification, geologic time, systems, the hydrologic cycle and water resources, climate, carbon and energy.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Admission to MNSE program. Offered as an online course only. Credit not allowed for both NSCI 670 and NSCI 680A6.
Term Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 677  Microscopic Image Collection & Processing  Credits: 2 (2-0-0)
Course Description: Modern microscopes generate terabytes of data presenting challenges for acquisition, long-term storage and extracting meaningful information to present it in an appropriate way for publication. This course covers fundamentals of data collection, storage and processing. Students will learn different software applications, ranging from commercial to technical computing languages and will develop their own data processing algorithms to synthesize publication-quality images from large data sets.
Prerequisite: (CS 156) and (STAT 511A, may be taken concurrently or STAT 511B, may be taken concurrently) and (GRAD 510, may be taken concurrently).
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 687A  MPNS Internship: Preparation  Credits: Var[1-4] (0-0-0)
Course Description: Design of an experiment utilizing microscopic imaging to collect quantitative data to test a hypothesis, which may include preparation of specimens, design and construction of a custom microscope, or the writing of software to control the microscope and acquire data. Images will be analyzed to extract quantitative data that tests the hypothesis.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of instructor.
Term Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 687B  MPNS Internship: Project  Credits: Var[1-8] (0-0-0)
Course Description: Hands-on experience in analysis of a variety of high throughput sequencing data done in small groups under the supervision of a faculty mentor.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of instructor.
Term Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

NSCI 687D  Internship: Microscopy  Credits: Var[1-8] (0-0-0)
Course Description: Internship in microscopy within the CSU Microscope Imaging Network Foundational Core Facility or within other organizations.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of instructor.
Term Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

NSCI 693  Seminar--MPNS  Credit: 1 (0-0-1)
Course Description: Students will present and discuss current research relevant to their specialization(s) and present results of their internships and group projects.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Enrollment in MPNS program.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 693D  Graduate Seminar: Microscopy  Credit: 1 (0-0-1)
Course Description: Presentation and discussion of current microscopy research relevant to a student’s specialization and associated with their internship experience.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

NSCI 695  Independent Study for the MNSE  Credits: 3 (0-0-3)
Course Description: Independent study based on review of the primary scientific literature in biology, chemistry, or physics.
Prerequisite: NSCI 698.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of instructor.
Term Offered: Summer.
Grade Mode: Traditional.
Special Course Fee: No.

NSCI 696D  Group Study: Microscopy Proposal  Credits: Var[1-6] (0-0-0)
Course Description: Design of an experiment utilizing microscopic imaging to collect quantitative data to test a hypothesis, which may include preparation of specimens, design and construction of a custom microscope, or the writing of software to control the microscope and acquire data. Images will be analyzed to extract quantitative data that tests the hypothesis.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

NSCI 696E  Group Study: Analysis of High-Throughput Sequencing Data  Credit: 1 (0-0-1)
Course Description: Hands-on experience in analysis of a variety of high throughput sequencing data done in small groups under the supervision of a faculty mentor.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Bachelor's degree required. Written consent of instructor.
Grade Mode: Instructor Option.
Special Course Fee: No.
NSCI 696F  Group Study: Biological Data Analytics Project  
Proposal  Credits: Var[1-6] (0-0-0)  
Course Description: Design hypothesis and method(s) to analyze data from genomic, proteomic, metabolomic, or other -omics experiments; or write software to facilitate analysis of data from -omics experiments.  
Prerequisite: None.  
Restriction: Must be a: Graduate, Professional.  
Registration Information: Bachelor's degree required.  
Terms Offered: Fall, Spring, Summer.  
Grade Mode: Instructor Option.  
Special Course Fee: No.

NSCI 698  Research Experience in Natural Sciences  Credits: 6 (0-0-6)  
Course Description: Research experience in biology, chemistry, or physics.  
Prerequisite: None.  
Restriction: Must be a: Graduate, Professional.  
Registration Information: Nine credits MNSE program coursework.  
Term Offered: Summer.  
Grade Mode: Traditional.  
Special Course Fee: No.