NATURAL SCIENCES (NSCI)

NSCI 111 - CONCEPTS IN PHYSICS AND ASTRONOMY
Short Title: CONCEPT IN PHYSICS & ASTRONOMY
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.
Course Level: Undergraduate Lower-Level
Description: This course is intended as an investigation of some of the major concepts in physics and astronomy that form the basis of our modern understanding of the universe. By focusing on scientific methodology and a few universal laws, the course will help students appreciate scientific discoveries and give them the conceptual understanding to form intelligent views of contemporary scientific issues. For non-science/engineering majors.

NSCI 120 - INTRODUCTION SCIENTIFIC RESEARCH CHALLENGES
Short Title: INTR SCIENTIFIC RES CHALLENGES
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Laboratory
Credit Hours: 3
Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.
Course Level: Undergraduate Lower-Level
Description: Students in NSCI 120 will solve client-based problems that require the discovery or application of scientific knowledge, specifically in the fields of biology and chemistry. Students will work in interdisciplinary teams and be involved in shaping their project and implementing the scientific method to find solutions. This course is limited to first-year students only. Mutually Exclusive: Cannot register for NSCI 120 if student has credit for BIOS 150.

NSCI 121 - SCHOLARLY APPROACHES TO GENERAL CHEMISTRY
Short Title: SCHOLARLY APPROACH TO GEN CHEM
Department: Natural Sciences Division
Grade Mode: Satisfactory/Unsatisfactory
Course Type: Seminar
Credit Hours: 0
Course Level: Undergraduate Lower-Level
Description: This course provides a small collaborative learning environment to reinforce best study practices and concepts covered in CHEM 121 and CHEM 122. Instructor Permission Required.

NSCI 199 - INDEPENDENT STUDY
Short Title: INDEPENDENT STUDY
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Independent Study
Credit Hours: 0-3
Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.
Course Level: Undergraduate Lower-Level
Description: Independent Study in an area of science with emphasis on scientific procedures and methods. Instructor Permission Required.

NSCI 201 - EFFECTIVE AND RESPONSIBLE USE OF AI TOOLS FOR WRITING IN STEM
Short Title: AI TOOLS FOR WRITING IN STEM
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 2
Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.
Course Level: Undergraduate Lower-Level
Description: This 2-credit elective course explores the role of artificial intelligence (AI) in enhancing writing and communication within STEM and medical fields. Students will gain practical experience with AI tools to assist in tasks such as literature searches, summarization, editing, and presentation creation. Emphasis is placed on ethical considerations, including plagiarism, data privacy, intellectual property, and bias. Through discussions, short assignments, and hands-on practice, students will learn to responsibly integrate AI into academic workflows. This course is suitable for students from all STEM disciplines, providing skills applicable across fields in natural sciences, engineering, and pre-medicine.

NSCI 238 - SPECIAL TOPICS
Short Title: SPECIAL TOPICS
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Internship/Practicum, Laboratory, Lecture, Seminar, Independent Study
Credit Hours: 1-4
Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.
Course Level: Undergraduate Lower-Level
Description: Topics and credit hours may vary each semester. Contact department for current semester's topic(s). Repeatable for Credit.

NSCI 305 - NEW VENTURE COMMUNICATION FOR SCIENCE AND ENGINEERING
Short Title: NEW VENTURE COMMUN FOR SCI&ENG
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hour: 1
Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.
Course Level: Undergraduate Upper-Level
Description: Teaches students in science or engineering the skills needed to discover, communicate, and promote products and services based on technological innovation or scientific research. Students learn to innovate a product or service with social or commercial application, write an early-stage business plan, and give a 10-minute financing presentation.

NSCI 320 - PUBLIC SCIENCE COMMUNICATION SEMINAR
Short Title: PUBLIC SCIENCE COMM SEMINAR
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hour: 1
Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.
Course Level: Undergraduate Upper-Level
Prerequisite(s): BIOC 201 or CHEM 111 or CHEM 121 or CHEM 151 or PHYS 101 or PHYS 111 or PHYS 125
Description: Scientists are increasingly expected to communicate with the public. In this course, students learn from people who regularly communicate about science with general audiences in order to gain an appreciation for the various types of public science communication, its importance to society, and techniques used in effective public science communication. Graduate/Undergraduate Equivalency: NSCI 520. Mutually Exclusive: Cannot register for NSCI 320 if student has credit for NSCI 520. Repeatable for Credit.

NSCI 410 - MEDICAL LEADERSHIP RESEARCH
Short Title: MEDICAL LEADERSHIP RESEARCH
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Research
Credit Hours: 1-5
Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.
Course Level: Undergraduate Upper-Level
Description: Students will help in ongoing research in the health profession program with Dr. Gia Merlo. Additionally, students may conduct independent medical leadership/professionalism research upon approval. Instructor Permission Required. Repeatable for Credit.

NSCI 477 - SPECIAL TOPICS
Short Title: SPECIAL TOPICS
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Internship/Practicum, Laboratory, Lecture, Seminar, Independent Study, Lecture/Laboratory
Credit Hours: 1-4
Restrictions: Enrollment is limited to Undergraduate, Undergraduate Professional or Visiting Undergraduate level students.
Course Level: Undergraduate Upper-Level
Description: Topics and credit hours may vary each semester. Contact department for current semester's topic(s). Repeatable for Credit.

NSCI 501 - PROFESSIONAL MASTER'S SEMINAR
Short Title: PROFESSIONAL MASTER'S SEMINAR
Department: Natural Sciences Division
Grade Mode: Satisfactory/Unsatisfactory
Course Type: Seminar
Credit Hour: 1
Restrictions: Enrollment is limited to Graduate level students. Enrollment limited to students in a MS in Applied Chemical Science, MS in Biosci & Health Policy, MS in Energy Geoscience, MS in Environmental Analysis or MS in Space Studies degrees.
Course Level: Graduate
Description: A weekly seminar which serves to provide exposure to local industry leaders from the areas of oil and gas exploration, nanotechnology, and environmental management; introduce career management and business relations tools; further develop written and oral communication skills; provide a forum for students to present internship project results. Repeatable for Credit.

NSCI 502 - SPACE STUDIES SEMINAR
Short Title: SPACE STUDIES SEMINAR
Department: Natural Sciences Division
Grade Mode: Satisfactory/Unsatisfactory
Course Type: Seminar
Credit Hour: 1
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: A weekly space seminar held by space industry leaders and organized by faculty providing exposure on "real-world" subjects , such as general, commercial and scientific aspects of space; mission planning and design; astrodynamics/orbital mechanics; spacecraft navigation; Payload definition; Space environment; propulsion and maneuvering; human factors; risk management; export control regulations and others. Repeatable for Credit.

NSCI 505 - ENVIRONMENTAL LAB
Short Title: ENVIRONMENTAL LAB
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Laboratory
Credit Hour: 1
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Laboratory module offered in conjunction with CAAM 353 that illustrates applications of numerical analysis in the solutions of common environmental science and engineering problems. Instructor Permission Required.

NSCI 506 - ENVIRONMENTAL CASE STUDIES
Short Title: ENVIRONMENTAL CASE STUDIES
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hour: 1
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Seminar bringing in outside speakers from the community to address environmental issues.

NSCI 510 - PROFESSIONAL MS INTERNSHIP
Short Title: PROFESSIONAL MS INTERNSHIP
Department: Natural Sciences Division
Grade Mode: Satisfactory/Unsatisfactory
Course Type: Internship/Practicum
Credit Hours: 12
Restrictions: Enrollment is limited to Graduate level students. Enrollment limited to students in a MS in Applied Chemical Science, MS in Biosci & Health Policy, MS in Energy Geoscience, MS in Environmental Analysis or MS in Space Studies degrees.
Course Level: Graduate
Description: Supervised internship or project associated with pursued degree. Exclusively for students in the Professional Master's Program in Natural Sciences. Repeatable for Credit.

NSCI 511 - SCIENCE POLICY, AND ETHICS
Short Title: SCIENCE POLICY, AND ETHICS
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: An introduction to the policy, ethics, politics, and legal issues that relate to science and technology - discovery and application. This course presents a framework for analyzing ethical issues in business and professional work. The course then explores the ways in which government policy and business practices can promote or inhibit advances in science and technology while influencing the ethical choices of the professionals involved. Case studies will be used.

NSCI 512 - PROFESSIONAL MASTER'S PROJECT
Short Title: PROFESSIONAL MASTER'S PROJECT
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Independent Study
Credit Hour: 1
Restrictions: Enrollment is limited to Graduate level students. Enrollment limited to students in a MS in Applied Chemical Science, MS in Biosci & Health Policy, MS in Energy Geoscience, MS in Environmental Analysis or MS in Space Studies degrees.
Course Level: Graduate
Description: Professional master students present the results of their internship or independent project. Recommended Prerequisite(s): NSCI 510

NSCI 515 - FOUNDATIONS OF PROJECT AND PROGRAM MANAGEMENT
Short Title: PROGRAM/PROJECT MANAGEMENT
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Today's complex socio-technical systems require planning, system thinking, tools and techniques to effectively manage. Recognizing this need, businesses and organizations have developed and fielded a myriad of mechanisms and tools to help them deliver complex systems and effectively manage portfolios of efforts to meet strategic needs. This course provides a fundamental understanding of the core principles for the tools and techniques. It includes exposure to the some of the software tools to give the student hands on experience with practical examples and apply critical thinking to select which techniques are appropriate in future undertakings which have the complexity to require them. The course also includes a review of the material required for students to pass the exam for PMP certification. The course consists of readings, lectures, case analyses and application of the tools and techniques to project ideas generated by the students.

NSCI 520 - PUBLIC SCIENCE COMMUNICATION SEMINAR
Short Title: PUBLIC SCIENCE COMM SEMINAR
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hour: 1
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Prerequisite(s): BIOC 201 or CHEM 111 or CHEM 121 or CHEM 151 or PHYS 101 or PHYS 111 or PHYS 125
Description: Scientists are increasingly expected to communicate with the public. In this course, students learn from people who regularly communicate about science with general audiences in order to gain an appreciation for the various types of public science communication, its importance to society, and techniques used in effective public science communication. Graduate/Undergraduate Equivalency: NSCI 320. Mutually Exclusive: Cannot register for NSCI 520 if student has credit for NSCI 320. Repeatable for Credit.

NSCI 521 - WRITING AND PUBLISHING SCIENCE
Short Title: WRITING AND PUBLISHING SCIENCE
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hour: 1
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: To prepare graduate students for writing and publishing independent research, this course examines the genre of the primary literature article; analyzes successful writing; explores ways of managing references and avoiding plagiarism; and addresses issues of authorship, submission, and peer review. Students will receive peer feedback on documents in preparation.

NSCI 530 - THE SHAPING OF HEALTH POLICY
Short Title: THE SHAPING OF HEALTH POLICY
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Study of how health-care policy decisions are made and implemented, using an interdisciplinary approach involving government, law, ethics, economics, and history. Includes case discussions of major policy problems by faculty experts in these disciplines and guest speakers who are leading national figures in the shaping of public policy. Mutually Exclusive: Cannot register for NSCI 530 if student has credit for POST 430/POST 530/SOSC 430.

NSCI 550 - APPLIED MATHEMATICS AND SCIENCE FOR TEACHERS
Short Title: APPLIED MATH FOR TEACHERS
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Rice office of STEM Engagement faculty and staff lead a discovery based course focused on K-12 mathematics and science with a focus on the combined content of mathematics, science, and literacy (ELA) in addition to pedagogy leadership. Instructor Permission Required.

NSCI 573 - TEACHING PHYSICS VIA INQUIRY I KINEMATICS
Short Title: TEACHING PHYSICS VIA INQUIRY I
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: This is a professional development course to serve high school physics teachers. It will cover topics in kinematics and mechanics with student-centered inquiry based pedagogy. Teachers will develop laboratory and hands-on activities, learn about new developments in physics research, and share best practices. The course goal is to improve teachers' science content knowledge related to the Texas Essential Knowledge and to provide teachers with tools to engage their students in science. Instructor Permission Required.

NSCI 574 - TEACHING PHYSICS VIA INQUIRY II, ELECTRICITY AND MAGNETISM
Short Title: TEACHING PHYSICS - INQUIRY II
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture/Laboratory
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: This is a professional development course to serve high school physics teachers. It will cover topics in electromagnetism with student-centered inquiry based pedagogy. Teachers will develop laboratory and hands-on activities, learn about new developments in physics research, and share best practices. The course goal is to improve teachers' science content knowledge related to the Texas Essential Knowledge and to provide teachers with tools to engage their students in science. Instructor Permission Required. Recommended Prerequisite(s): NSCI 573.

NSCI 580 - CONTEMPORARY TOPICS IN ELEMENTARY SCHOOL MATHEMATICS
Short Title: CONTEMP TOPICS IN ELEM MATH
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 1-6
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Mathematics topics related to and transcending elementary school mathematics. Active, student-centered, inquiry-based learning experiences using manipulatives and the latest technologies in a collaborative setting. Contemporary readings related to mathematics education. Problem-solving and motivational strategies, assessment, differentiated instruction, and questioning techniques to meet the needs of all learners. Curriculum development using the RUSMP Learning Plan.

NSCI 585 - CONTEMPORARY TOPICS IN MIDDLE SCHOOL MATHEMATICS
Short Title: CONTEMP TOPICS IN MDL SCH MATH
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 1-6
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Mathematics topics related to and transcending middle school mathematics. Active, student-centered, inquiry-based learning experiences using manipulatives and the latest technologies in a collaborative setting. Contemporary readings related to mathematics education. Problem-solving and motivational strategies, assessment, differentiated instruction, and questioning techniques to meet the needs of all learners. Curriculum development using the RUSMP Learning Plan.

NSCI 586 - CONTEMPORARY TOPICS IN K-12 SCIENCE AND MATHEMATICS
Short Title: CONT TOPICS IN K-12 SCI & MATH
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 1-6
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Contemporary topics in grades K-12 science and mathematics instruction and covers both content and pedagogy. Multiple sections are offered. Each section focuses on specific areas of instruction at specified grades. All sections include field studies or research internships, inquiry, curriculum development and implementation of instructional strategies in the classroom. Students may enroll in different sections for repeated credit. Instructor Permission Required. Repeatable for Credit.

NSCI 590 - CONTEMPORARY TOPICS IN SENIOR HIGH SCHOOL MATHEMATICS
Short Title: CONTEMP TOPICS HIGH SCHL MATH
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 1-6
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Mathematics topics related to and transcending high school mathematics. Active, student-centered, inquiry-based learning experiences using manipulatives and the latest technologies in a collaborative setting. Contemporary readings related to mathematics education. Problem-solving and motivational strategies, assessment, differentiated instruction, and questioning techniques to meet the needs of all learners. Curriculum development using the RUSMP Learning Plan.

NSCI 591 - DESIGN FOR AEROSPACE ENVIRONMENTS
Short Title: AEROSPACE ENVIRONMENTS
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Graduate course on aerospace environments, including theoretical bases. Topics include key mission phases, orbital mechanics, the effects of the sun, plasma, particles and ionizing radiation, neutral atmosphere, contamination, micrometeoroid/orbital debris, thermal and aerothermal environments. Extraterrestrial environments are briefly discussed. Cross-list: MECH 592.

NSCI 592 - SEMINAR IN SCIENCE FOUNDATIONS
Short Title: SEMINAR IN SCIENCE FOUNDATIONS
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Seminar
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: SEMINAR IN SCIENCE FOUNDATIONS ***** Seminar with a team of university faculty and community-based scientists (in fields such as medicine, space, energy, and the environment) to increase understanding of scientific principles as they are applied in the scientific community of Houston and as they relate to secondary school science.

NSCI 595 - TOPICS IN CONTEMPORARY ALGEBRA FOR IN-SERVICE TEACHERS
Short Title: TOPICS IN CONTEMP ALGEBRA
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 1-6
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: Emphasis on function concepts through multiple representations and problem solving. Algebraic thinking and symbolic reasoning, underlying mathematical processes, and connections between algebra and the other mathematical strands. Active, student-centered, inquiry-based learning experiences using manipulatives and the latest technologies in a collaborative setting. Contemporary readings related to mathematics education.

NSCI 610 - MANAGEMENT FOR SCIENCE AND ENGINEERING
Short Title: MGT FOR SCIENCE/ENGINEERING
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Lecture
Credit Hours: 3
Restrictions: Enrollment is limited to Graduate level students.
Course Level: Graduate
Description: This course is for graduate and undergraduate students who want to understand the basics of management in new and/or small technology-based businesses and is particularly relevant to students who are interested in careers in technology or entrepreneurial ventures. NSCI 610/ENGI 610 is team taught to provide insight into how technology oriented firms manage people, projects, accounting, marketing, strategy, intellectual property, organizations and entrepreneurship. Student's active participation is essential. Students who take this course are eligible for MGMT 625. Cross-list: ENGI 610.

NSCI 677 - SPECIAL TOPICS
Short Title: SPECIAL TOPICS
Department: Natural Sciences Division
Grade Mode: Standard Letter
Course Type: Internship/Practicum, Laboratory, Lecture, Seminar, Independent Study
Credit Hours: 1-4
Restrictions: Enrollment is limited to Graduate or Visiting Graduate level students.
Course Level: Graduate
Description: Topics and credit hours vary each semester. Contact department for current semester's topic(s). Repeatable for Credit.