

Niagara Falls High School

Science Course Descriptions

LIVING ENVIRONMENT

SCI130 – 1.0 credit

The course provides a survey of biology topics including biochemistry, ecology, human physiology, reproduction, genetics, biodiversity and evolution. Students will be provided with the opportunity to develop scientific inquiry techniques and skills using a problem-solving approach. Students must successfully complete the state mandated 1200 minutes of laboratory experience with satisfactory written reports in order to be admitted to the Regents Exam.

EXAM: NYS Regents Exam in Living Environment.

EARTH SCIENCE

SCI230 – 1.0 credit

The course includes the study of geology, astronomy, meteorology and environmental issues. Students will be provided with the opportunity to develop scientific inquiry techniques and skills using a problem-solving approach. Each student must successfully complete the state mandated 1200 minutes of laboratory experience in order to be admitted to the Regents Exam.

EXAM: NYS Regents Exam in Physical Setting/Earth Science & Performance Assessment

STEM: BIOLOGY

SCI236 – 1.0 credit

The STEM Biology course is currently offered to 10th graders who are interested in learning about the Human Body and its structure and functions. We learn this rigorous and relevant curriculum through an Inquiry based approach integrated with math, engineering and technology. It is student centered and focuses on problem and project-based learning. This course will help provide a background for those interested in going into Sports Medicine, AP Biology, STEM Biosciences/Math Integration or other pathways such as nursing in college. We will collaborate with local health organizations and universities to help prepare you with the current knowledge and skills necessary to enter the STEM workforce. You will learn some of these units within the context of our community and how this knowledge applies to understand and improve our daily lives.

EARTH SCIENCE AC

SCI240 – 1.0 credit

This is an accelerated Earth Science course typically given to ninth grade students who have previously taken Living Environment in Middle School.

EXAM: NYS Regents Exam in Physical Setting/Earth Science & Performance Assessment

CHEMISTRY
SCI330 – 1.0 credit

The course is a survey of chemistry topics for students who have demonstrated high interest and ability in studying science and mathematics. The course focuses on theories of matter and energy and includes topics such as atomic bonding and concepts, the periodic table, kinetics, equilibrium, acids and bases, redox reactions, nuclear chemistry, organic chemistry, and stoichiometry. Students will use sophisticated laboratory equipment to develop scientific inquiry skills using a problem solving approach. Students must successfully complete 1200 minutes of laboratory experience with satisfactory written reports in order to be admitted to the Regents Exam.

EXAM: NYS Regents Exam in Physical Setting/Chemistry

FORENSIC SCIENCE (Non-College)
SCI331 – 1.0 credits

This course is designed to introduce the student to practical applications of chemistry, physics, and biology in the study of forensics. Students will be given an introduction to the theoretical understanding and practical application of forensic science techniques including: forensic DNA typing, bloodstain pattern analysis, forensic entomology, forensic toxicology, drugs and poisons, forensic anthropology, crime scene investigations, evidence collection and examination, ballistics. Understanding of the relationship between forensic science and legal studies, and career opportunities in forensics will also be discussed. The class is designed around authentic performance assessments with students working in teams to solve crimes using scientific knowledge and reasoning.

EXAM: NFCSO final Exam

FORENSIC SCIENCE
SCI332 – 1.0 credit

Forensic science is the application of science to solving crimes in the criminal justice system. This course will investigate Criminalistics and the application of science in the services of a crime laboratory. It involves all areas of science with an emphasis in critical thinking and complex reasoning. Students will become familiar with biological evidence such as DNA fingerprinting, hair analysis, fire arms, computer forensics, drug analysis and other forms of identification. Exposure to career pathways in the criminal justice system and hands-on learning are integrated into the study of solving crimes. Labs will be incorporated into the class to facilitate learning.

PREREQUISITE: Students must have already passed either the Living Environment or Earth Science Regents exam

Upon enrollment and successful completion of the course, students can earn 3 transferable CHEM108 credits from Niagara University.

EXAM: Local exam with the approval from Niagara University.

Co-Registration at Niagara University: NUSTEP CHEM 108

NATURAL DISASTERS

SCI333 – 1.0 credit

Earthquakes, volcanic eruptions, tsunamis, hurricanes, tornadoes, floods, wildfires, and global climate change are among the natural disasters that can devastate civilizations and alter the course of world history. This course explores the physical causes, effects and social consequences of such events. Several recent natural disasters are examined in depth to analyze the processes responsible for them and how that understanding translates into public policy and governmental response, for better or worse.

PREREQUISITE: Students must have already passed either the Living Environment or Earth Science Regents exam

Upon enrollment & successful completion of the course, students can earn 3 transferable ESC174 credits from Niagara University.

EXAM: NFCSD exam with the approval from Niagara University.

Co-Registration at Niagara University: NUSTEP ESC 174

NATURAL DISASTERS (Non-College)

SCI334 – 1.0 credit

A non-college version of SCI333.

Earthquakes, volcanic eruptions, tsunamis, hurricanes, tornadoes, floods, wildfires, and global climate change are among the natural disasters that can devastate civilizations and alter the course of world history. This course explores the physical causes, effects and social consequences of such events. Several recent natural disasters are examined in depth to analyze the processes responsible for them and how that understanding translates into public policy and governmental response, for better or worse.

PREREQUISITE: Students must have already passed either the Living Environment or Earth Science Regents exam

ENVIRONMENTAL SCIENCE

SCI335 – 1.0 credit

The course is an elective course, which is structured in a seminar and case study approach for research in environmental issues and conservation. The course will be taught from a scientific point of view through a global perspective. Students will be required to complete a research project as part of the final assessment.

EXAM: NFCSD final exam and a final research project

STEM: BIOSTATISTICS

SCI336 – 2.0 Credits (1 credit – Science; 1 credit – Math)

This is a unique course that blends biology and statistics using real world issues and applications. Science, technology, engineering, and mathematics are explored through project-based learning, experimentation, and various methods of data collection and review. This course takes place in one of the state-of-the art STEM classrooms that includes technology such as gel-electrophoresis equipment, digital microscopes, and micro-bits, which allows for a true hands-on experience. Some of the biology topics explored include infectious diseases, genetic disorders, genomics, and concussion and addiction research. Data related to these topics is gathered and analyzed using Microsoft excel and students will become familiar with displaying and describing data, regression, statistical inference, the normal curve, hypothesis testing, and confidence intervals.

Upon enrollment and successful completion of this course, students can earn 6 credits from Niagara University. Three credits for BIO101 and three credits from MAT102.

Prerequisite: Successful completion of the NYS Living Environment Regents Exam, NYS Algebra/Common Core Algebra I Exam, and the NYS Global Exam.

EXAM: Two final exams – Biology and Statistics

PHYSICS

SCI430 – 1.0 credit

The course is a survey of Physics principles. Topics include mechanics, energy, electricity, waves and modern physics. Students will use sophisticated laboratory equipment to develop scientific inquiry skills using a problem solving approach. The students must successfully complete the state mandated 1200 minutes of laboratory experience with satisfactory written reports in order to be admitted to the Regents Exam.

Upon enrollment & successful completion of the course, students can earn 8 transferable credits from NCCC.

EXAM: NYS Regents Exam in Physical Setting/Physics.

SCIENCE SEMINAR

SCI435 – 1.0 credit

The course is an elective course, which is discussion oriented. The emphasis is on current events as they pertain to everyday modern life and stem related career awareness. Topics include major issues that have been impacted by research breakthroughs and technology in Life Sciences.

EXAM: NFCSD final Exam

HUMAN BIOLOGY

SCI432 – 1.0 credit

A biological study of the structures and functions of the human body through the lens of Sports Medicine. This course is designed to increase the student's understanding of introductory human anatomy and physiology at both microscopic and macroscopic levels. Featured content covers the the functional aspects of the human body at chemical, cellular, organ, and organ system levels. Course topics will include chemistry of life, anatomy of the body systems and the applied physiology in association with injuries, prevention, and treatment. Principles of health, nutrition, and biological threats due to environmental conditions are also included. Investigative experiences offer a variety of guided and open inquiry laboratories, numerous case studies, and quarterly research projects. Students will also have the opportunity to become certified in American Red Cross CPR/AED for Professional Rescuers and Health Care Providers.

PREREQUISITE: Students must have already passed either the Living Environment or Earth Science Regents exam

Co-Registration at Niagara University (NUSTEP BIO 101): Upon enrollment and successful completion of the course, students can earn 3 transferable BIO 101 credit from Niagara University

EXAM: Local exam with the approval from Niagara University

AP BIOLOGY

SCI450 – 2.0 credits

The course is a college level course designed around specific topics, concepts and themes. The topics include: molecules and cells, heredity and evolution, organisms and populations. Students will be provided with a framework, factual knowledge and analytical skills necessary to deal critically with the rapidly changing science of Biology. Upon successful completion of the nationally administered College Board Examination, many colleges award advanced placement status, credit or both. Upon proper enrollment and successful completion, students may also receive 3 transferable BIO 102 credits from Niagara University.

EXAM: College Board Examination in AP Biology & NFCSD Final Exam with approval from Niagara University

Co-Registration at Niagara University: NUSTEP BIO 102

AP CHEMISTRY

SCI453 – 2.0 credits

This course is a college level course, which emphasizes the quantitative applications of the basic physical and chemical relationships in topics such as: atomic theory, acid-base theory, kinetics and equilibrium. The required laboratory program is designed to establish the existence of the laws of nature while using the correct manipulative technique. Upon successful completion of the nationally administered College Board Examination, many colleges award advanced placement status, credit or both. Students are required to take the Chemistry AP exam.

EXAM: College Board Examination in AP Chemistry & NFCSD Final Exam with approval from Niagara University

Co-Registration at Niagara University: NUSTEP CHEM 111/112

AP ENVIRONMENTAL SCIENCE

SCI455 – 2.0 credits

AP Environmental Science is a college level course which goal provides students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them.

Environmental science is an interdisciplinary course; it embraces a wide variety of topics from all 4 areas of study – living environment, chemistry, physics, and earth science.

EXAM: College Board Examination in AP Environmental Science

Co-Registration at Niagara University: NUSTEP BIO 103

STEM: APPLIED MATH/SCIENCE INNOVATIONS

MAT336 – 2.0 Credits (1 credit – Science; 1 credit – Math)

The STEM classroom entitled Applied Innovations offers a rich exposure to computer design, product based engineering, computer coding and robotics. STEM (Science Technology Engineering and Mathematics) careers are the most rapidly growing fields in today's work force. Students will have an opportunity to work with 3D Scanners and Printers, CNC Routers, and Laser Cutters to create both physical and virtual manipulatives while studying pre-engineering topics. The focus of the class will be project-based inquiry learning which develops a student's ability to adapt to modern day work force skills.

We are a project based classroom. Each unit of study explores current advancements in STEM related fields while focusing on a different area of Science. Applied mathematical concepts will be needed in every aspect of the course as well. Students must be comfortable with working independently and in groups to complete in-class activities and projects, including quarterly portfolio assessments.

Upon enrollment and successful completion of this course, students can earn 3 total transferable DRF275 – Advanced Computer Aided Design & Drafting credits from NCCC.

PREREQUISITE: Successful completion of the NYS Living Environment Regents Exam,

NYS Integrated Algebra/Common Core Algebra I Exam and the NYS Global Exam.