SCIENCE DEPARTMENT

The mission of the Science Department is to provide each student with the 21st century skills necessary to understand and explain current events, scientific phenomena, and scientific and technological advances using critical thinking and problem solving skills so that they may be an informed global citizen.

Possible Science Progression*

*Based on a student's final grade in his classes, it is possible to move into different pathways

Class of 2022

Grade 9	Grade 10	Grade 11	Grade 12
Conceptual Physics (L1)	Biology (L1)	Chemistry (L1)	Science Elective
Conceptual Physics (L2)	Biology (L2)	Chemistry (L2)	Science Elective
Conceptual Physics (L3)	Biology (L3)	Chemistry (L3)	Science Elective
Conceptual Physics (L3)	Chemistry (L3)	Biology (L3)	Science Elective
Conceptual Physics (L3)	Chemistry (L3)	Biology (L4)	Physics (L4 OR L3)

Class of 2023

Grade 9	Grade 10	Grade 11	Grade 12
Conceptual Physics (L1)	Biology (L1)	Chemistry (L1)	Science Elective
Conceptual Physics (L2)	Chemistry (L2)	Biology (L2)	Science Elective
Conceptual Physics (L3)	Chemistry (L3)	Biology (L3)	Science Elective
Conceptual Physics (L3)	Chemistry (L3)	IB Biology 11 or Biology(L4)	IB Biology 12 or Physics (L4 OR L3)

Class of 2024 & 2025

Grade 9	Grade 10	Grade 11	Grade 12
Conceptual Physics (L1)	Chemistry (L1)	Biology (L1)	Science Elective
Conceptual Physics (L2)	Chemistry (L2)	Biology (L2)	Science Elective
Conceptual Physics (L3)	Chemistry (L3)	Biology (L3)	Science Elective
Conceptual Physics (L3)	Chemistry (L3)	IB Biology 11 or Biology(L4)	IB Biology 12 Physics (L4 OR L3)

#S113A/B Conceptual Physics Honors

1 Credit Level 3 NCAA

This course provides a conceptually-based exposure to the fundamental principles and processes of the physical world. Topics include basic concepts of motion, forces, and energy. This STEM course will integrate science and engineering practices in the learning with application to real world situations. Collaborative, inquiry-based strategies will be engaged in that will include laboratory experiments and activities that will be hands-on. Students will integrate these practices to critically think and explain phenomena in our world and the universe while engaging in scientific argumentation to connect content and concepts explaining problems and questions encountered in class. Students will collect and analyze data to find patterns and trends that help to explain our world. Math practices and activities will be challenging on the Algebra 1 Level and will enhance student learning of the content.

Requirements for placement: previous school record, high math scores on the entrance exam, placement into Level 3 Math courses, and signature of school counselor

#S112A/B Conceptual Physics

1 Credit Level 2 NCAA

This course provides a conceptually-based exposure to the fundamental principles and processes of the physical world. Topics include basic concepts of motion, forces, and energy. This STEM course will integrate science and engineering practices in the learning. Collaborative, inquiry-based strategies will be engaged in that will include laboratory experiments and activities that will be hands-on. Math practices and activities will be Algebra 1 Level and will enhance student learning of the content. Students will integrate these practices to critically think and explain phenomena in our world and the universe while engaging in scientific argumentation to connect content and concepts explaining problems and questions encountered in class.

Requirements for placement: placement into Level 2 Math class

#S111A/B Conceptual Physics

1 Credit Level 1 NCAA

This course provides a conceptually-based exposure to the fundamental principles and processes of the physical world. Topics include basic concepts of motion, forces, and energy. This STEM course will integrate science and engineering practices in the learning. Collaborative, inquiry-based strategies will be engaged in that will include laboratory experiments and activities that will be hands-on. Math practices and activities will be kept at a very basic Algebra 1 Level and will enhance student learning of the content. Students will integrate these practices to critically think and explain phenomena in our world and the universe while engaging in scientific argumentation to connect content and concepts explaining problems and questions encountered in class.

Requirements for placement: placement into Level 1 Math class

#S24A/B Biology L4

1 Credit Level 4 NCAA

Biology Level 4 is a course designed to provide a foundation for higher Level courses in Biology and related life sciences, and as a preparation for further study in a college setting. The purpose of this course is to enable students to earn credit from the University of Connecticut in the course BIOL 1107: Principles of Biology I.

Requirements for placement for the Class of 2021: minimum grade of 88 in Chemistry L3 and Biology L3, or minimum grade of 90 in Chemistry L2 and Biology L2: signature of Biology L4 teacher

Requirements for placement for the Class of 2022: 90 overall average or better: minimum grade of 90 in Chemistry L3: signature of Biology L4 teacher

#S23A/B Biology Honors

1 Credit Level 3 NCAA

This accelerated course is for the student of above average ability and achievement. It covers the same material as Biology Level 2 but in more detail. Fundamental concepts are introduced, reinforced, and expanded on to prepare the student for the challenges and intensity of advanced Level science courses. Discussion and lab work are the major components of the course and through inquiry-based learning, the student will develop scientific critical thinking and reasoning skills.

Requirements for placement: minimum grade of 85 in Chemistry L3: signature of Honors Biology teacher

#S22A/B Biology

1 Credit Level 2 NCAA

This course is designed to acquaint the student with selected topics from the areas of traditional and modern biological science. Students are introduced to theoretical concepts and practical applications of biology. Discussion and laboratory work are the major components of the course.

Requirements for placement: junior status

#S21A/B Biology

1 Credit Level 1 NCAA

This course is designed to acquaint the student with selected topics from the areas of traditional and modern biological science. Students are introduced to theoretical concepts and practical applications of biology. Discussion and laboratory work are included in the course.

Requirements for placement: sophomore status: signature of school counselor

#S33A/B Chemistry Honors

1 Credit Level 3 NCAA

The Level 3 Chemistry course is an introductory Level course similar in design to the standard chemistry course but broader in scope and more detailed in specifics. It seeks to provide a strong background in the fundamentals of theory and lab work, provide difficult problem-solving situations for the highly competitive student.
Requirements for placement for the Class of 2022: minimum grade of 85 in Biology L3 and minimum grade of 90 in Algebra II Level 2, or 85 in Algebra II Honors Level 3: signature of Chemistry teacher
Requirements for placement for the Class of 2023: minimum grade of 85 in Conceptual Physics L3: concurrently enrolled in Algebra II Honors Level 3: signature of Chemistry teacher

#S32A/B Chemistry

1 Credit Level 2 NCAA

This course is intended to introduce the student to the fundamentals of the discipline, show him a practical application of his math studies to tangible subjects, and increase his reading ability by offering problem-solving situations that demand his attention, concentration, and organization. The course emphasizes problem-solving and lab work. The general topics include but are not limited to: atomic theory, stoichiometry, mass energy relationships, Periodic Law and acid-base theory. While some lab exercises are qualitative in nature, the majority of the exercises serve to quantify the behavior of matter and energy in both chemical and physical changes.
Requirements for placement for the Class of 2022: completion of Biology
Requirements for placement for the Class of 2023: completion of Conceptual Physics

#S31A/B Chemistry

1 Credit Level 1 NCAA

This course introduces the student to general topics in chemistry. Class lectures, close reading of material, and laboratory work are the major components of the course. The course emphasizes problem-solving and lab work. The general topics include but are not limited to: atomic theory, stoichiometry, mass energy relationships and Periodic Law. While some lab exercises are qualitative in nature, the majority of the exercises serve to quantify the behavior of matter and energy in both chemical and physical changes.
Requirements for placement: junior status: signature of counselor

#S34A/B Chemistry L4

1 Credit Level 4 NCAA

This course is designed to provide a foundation for more advanced courses in chemistry. Topics of study include atomic theory; laws and theories concerning the physical and chemical behavior of gases, liquids, solids, and solutions; properties of some of the more familiar elements and their compounds; quantitative measurements illustrating the laws of chemical combination; equilibrium in solutions and qualitative reactions of the common cations and anions. The course is Algebra-based. Students will be prepared to take the College Board's AP Chemistry exam after completion of the course.
Requirements for placement: 88 in Chemistry Honors and Algebra II Honors (Level 3) OR 90 in Chemistry and Algebra II (Level 2); signature of Chemistry L4 teacher

#S84A/B Physics L4

1 Credit Level 4 NCAA

This course will develop a deep understanding of physics concepts. Students must have strong algebra and trigonometry skills, and must have completed calculus or be concurrently enrolled in calculus. The course provides a quantitative study of the basic facts and principles of physics and includes a lab component with fundamental training in physical measurements. Topics of study include kinematics, dynamics, circular and rotational motion, oscillations and waves, thermodynamics, and fluid mechanics. The purpose of this course is to enable students to earn credit from the University of Connecticut in the course PHYS 1401Q: General Physics with Calculus I. The students will also be prepared to take the College Board's AP Physics C: Mechanics exam after completion of the course. This is a Calculus-based course.
Requirements for placement: minimum grade of 90 in Conceptual Physics L2 or 85 in Conceptual Physics L3: concurrent enrollment in Calculus Level 4 or Calculus Level 3: signature of Physics L4 teacher

#S73A/B Physics Honors

1 Credit Level 3 NCAA

This course is primarily for students who have a strong interest in math, science, technology and engineering. Physics is the science which deals with natural laws and processes. It strives to bring about an understanding of the most basic scientific topics, and in doing so, forms a foundation for the sciences. Coursework includes Mechanics/Newtonian Physics. This course is designed for students who want to build a solid foundation in physics for college. This is an Algebra and Trigonometry based course.
Requirements for placement: minimum grade of 85 in Conceptual Physics L2 or 80 on Conceptual Physics L3: minimum grade of 80 in Algebra II Honors, Geometry Honors, and Trigonometry Honors: signature of Physics L3 teacher

#S52A/B Anatomy & Physiology

1 Credit Level 2 NCAA

This course will cover the basic patterns of human development and organizational themes. Material will be taught through a variety of class presentations, discussions, and laboratory work. Emphasis will be placed on anatomy, physiology, and pathology.
Requirements for placement: minimum grade of 80 in Biology L2 and Chemistry L2, or minimum grade of 78 in Biology L3 and Chemistry L3: signature of Anatomy & Physiology teacher

#SS15A Astronomy

0.5 Credit Level 2

Astronomy is the scientific study of the contents of the entire Universe. This course will introduce students to the composition and structure of the Universe, and provide students with a study of the Universe and the conditions, properties, and motions of bodies in space. The content includes, but is not limited to, historical astronomy, astronomical instruments, the celestial sphere, the solar system, the Earth as a system in space, the Earth/Moon system, the Sun as a star, and stars. Algebra and Geometry will be used.

Requirements for placement: completion of Geometry: minimum grade of 80 in Chemistry L2 and Conceptual Physics L2, or minimum grade of 78 in Chemistry L3 and Conceptual Physics L3: signature of Science Department Chairperson

#SS16A Epidemiology

0.5 Credit Level 2

This course is intended to introduce students to the fundamentals of Epidemiology and the role public health science plays in improving health and preventing diseases. Emphasis will be on real life case studies and realistic simulations to learn the strategies and build the skills necessary to become a real disease detective. General topics include, but are not limited to, the ebola response, multistate outbreaks of salmonella, seasonal flu, exposure to radon, and vaccines

Requirements for placement: minimum grade of 80 in Biology L2, or minimum grade of 78 in Biology L3: signature of the Biology teacher

#S42A Marine Ecology

0.5 Credit Level 2 NCAA

This one semester course of study will provide an opportunity to investigate the unique nature of marine life, the physical and chemical characteristics of a body of water including temperature, water currents, tides, and sediments, and the history and geology of Long Island Sound as well as the history of ocean exploration. We will also study the issues of land use and its effects on economics and ecology of coastal communities.

Requirements for placement: junior or senior status; signature of Marine Ecology teacher

#S92A Forensic Science

0.5 Credit Level 2 NCAA

This course is designed to acquaint students to the different aspects of Forensic Science. It will integrate various sciences to solve specific crimes and make sense of complex problems that require logical reasoning and involve numerical data, evidence, and uncertainty. This course embodies concepts in many areas including biology, chemistry, anatomy, genetics, physics, medicine, mathematics, sociology, psychology, and law. Crimes will be analyzed using proper crime scene investigative techniques. Topics include the recognition, identification, individualization, and evaluation of physical evidence such as hairs, fibers, bones, narcotics, blood, glass, soil, fingerprints, documents, firearms, and toolmarks. Class discussion with lab work will be key components of this course.

Requirements for placement: junior or senior status; signature of Forensic Science teacher

#S90A Science Internship

0.5 or 1.0 Credit Level*

This internship is designed to offer students the opportunity to serve as an assistant to science teachers in preparing and teaching laboratories for their courses throughout the year. Responsibilities will include coordinating with science teachers in the areas of lab preparation, cleanup, acting as a teacher's assistant during labs, and other duties that help the department operate smoothly. Students must be willing to make a commitment to this internship and may be asked to extend their duty time to include community period or after school, as necessary.

Requirements: senior status: minimum of 80 in Conceptual Physics, Chemistry, and Biology: signature of Science Department Chairperson