

# Science

Biology (Co-Taught)

Biology

Biology PCB

AP Biology

Chemistry (Co-Taught)

Chemistry

Chemistry PCB

AP Chemistry

Environmental Geoscience (Co-Taught)

Environmental Geoscience

AP Environmental Geoscience

Physics

Physics PCB

AP Physics 1

AP Physics 1 & 2

AP Physics C

Anatomy and Physiology

Advanced Anatomy and Clinical Health Science

Applied Human Anatomy

Astronomy

Biomechanics and Sports Medicine

Forensic Science

Marine Biology

Zoology

Chemistry (EL)

Biology (EL)

Survey of Science and Society (Co-Taught)

Survey of Biology (Co-Taught)

Survey of Physical Sciences (Co-Taught)

The science curriculum is designed to develop the scientific, investigative process in students. Through a variety of learning experiences, students engage in scientific inquiry and explore principles of science through careful observation. Students learn the historical contributions of scientists and develop a sense of excitement regarding the discovery process.

## GOALS OF THE SCIENCE DEPARTMENT

Upon completion of any course of study within the science department, students will:

- Understand how science is incorporated into the human experiences of history, society, culture, politics, and technology;
- Use scientific models and theories to explain the concepts and principles of the world;
- Use the inquiry process of science that includes recognition of natural phenomena, collection of data, and testing of hypotheses using experiments; and
- Connect science disciplines to one another and to students' lives.

## GRADUATION REQUIREMENTS

**New Trier requires students to take two years of science:** Biology and a physical science course (Environmental Geoscience, Chemistry, or Physics).

Most New Trier students take at least **three** years of science because many colleges require three years of laboratory science courses for admission, with two of the three years in biology, chemistry, or physics. New Trier considers Environmental Geoscience to be a core science course, equivalent in importance and rigor to the other three areas of science.

Students with a strong interest in and orientation toward science should consider taking **four** years of laboratory science.

## SCIENCE PATHWAYS

There are multiple pathways through the science curriculum at New Trier, which have been designed so that students have options to explore their interests and utilize their talents. The Science Pathways charts on the department website exemplify the most common science pathways at New Trier. ([www.newtrier.k12.il.us/sciencepathways](http://www.newtrier.k12.il.us/sciencepathways))

In addition, there are many interesting elective courses and AP courses available. Please refer to the following course descriptions for specific prerequisites and additional offerings.

## SUCCESS IN SCIENCE COURSES

Success in science can be achieved through effective study skills and appropriate level placement. Such success is driven primarily by the student's independence as a learner, engagement in class, completion of the requisite work outside of class, and related abilities demonstrated in English and/or math courses.

## FRESHMAN COURSES

The Science Department offers three laboratory courses for freshmen: Biology, Environmental Geoscience, and Physics PCB. Students are encouraged to choose the course that best matches their interests and draws on their academic strengths. Each course appeals to students for different reasons, but all

three courses provide students with an opportunity to experience science in a laboratory setting. Each course has a double-period lab that meets twice a week, and all three courses require students to work independently and collaboratively. Placement in levels is linked to English placement for Biology and Environmental Geoscience, and to math placement for Physics PCB. For some students, it may be appropriate to delay taking a science course until sophomore year.

## ELECTIVE COURSES

The following science elective courses provide students with the unique opportunity to pursue specific science interests.

- Survey of Science and Society (Co-Taught)
- Anatomy & Physiology
- Astronomy
- Biomechanics and Sports Medicine
- Forensic Science
- Marine Biology
- Zoology
- Applied Human Anatomy
- Advanced Anatomy and Clinical Health Science

These courses do NOT fulfill the New Trier graduation requirement in science.

## AP COURSES

AP science courses are equivalent to college courses, both in content and expectations. In order to be successful in AP courses, students must be highly motivated, independent learners. **Before enrolling in an AP course, students should consider the rigor and demands of an AP course in relation to expectations for other courses as well as their total course load, extracurricular activities, activities outside school, and performance in previous science classes.**

AP science courses are open to **juniors and seniors** who meet the individual course prerequisites. All AP science courses require a student or parent to contact the department chair to request a level change if the student has taken one or more 2-level or Co-taught science courses **or** if the student's current science teacher determines that a request for a level change is necessary.

## EARLY BIRD SCIENCE CLASSES (WINNETKA ONLY)

Early bird science classes are offered based on student demand as well as teacher and lab room availability. Since there are usually more requests for early bird classes than can be accommodated, students who request early bird science classes are entered in a lottery that determines enrollment status. Given the tentative nature of early bird course registration, students should have an alternate plan. **Early bird science classes meet blue and green days from 7:00 a.m. to 8:10 a.m.**

## SUMMER SCHOOL

Selected science courses are offered in summer school; please refer to the Summer School Brochure. AP courses are not offered during summer school.

# Biology Courses

## Survey of Biology (Co-Taught) level 2

OPEN TO SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: NONE  
PLACEMENT BASED ON ENGLISH AND MATHEMATICS LEVELS

Survey of Biology is a year-long, activity-oriented laboratory course. Topics include the scientific method, cellular biology, genetics, ecology, and human anatomy and physiology (including dissection of a fetal pig). Health and disease are also explored. Each unit includes reading of textbook material along with a variety of supporting activities, laboratory exercises, and demonstrations. This course is co-taught by science and special education teachers. *Students are also required to take Survey of Physical Sciences (Co-taught) to fulfill the two-year laboratory science graduation requirement. This course is offered every other year.*

## Biology (Co-Taught) level 2

OPEN TO FRESHMEN, SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: NONE  
FRESHMAN PLACEMENT BASED ON ENGLISH LEVEL

This activity-based laboratory course focuses on five major themes: ecology, cellular biology and genetics, evolution, taxonomy, and human anatomy and physiology (including dissection of a fetal pig). Health and disease are also explored. Each area is explored in detail through laboratory exercises, library and online research, group projects and presentations, and classroom simulations. This course is co-taught by science and special education teachers. *This course fulfills the graduation requirement for biology.*

## Biology levels 2, 3, & 4

OPEN TO FRESHMEN, SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: NONE  
FRESHMAN PLACEMENT BASED ON ENGLISH LEVEL

This laboratory course in life science explains life from the microscopic level of cells to the interactions of populations with their environment. This survey course in Biology challenges students to explore a broad range of topics and major themes, including cellular structure, function and processes, macromolecules, genetics, evolution, taxonomy, ecology, and human anatomy and physiology (including dissection of a fetal pig). Health and disease are also explored. Lab experiences are designed to develop skills in making observations, gathering data, and thinking critically to assess results. Emphasis is placed on building conceptual understandings while applying scientific knowledge to the real world. *This course fulfills the graduation requirement for biology.*

## Biology PCB levels 3 & 4

OPEN TO SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: PHYSICS PCB AND CHEMISTRY PCB  
PLACEMENT BASED ON CHEMISTRY PCB LEVEL

This laboratory course is designed to be taken after completing one year of Physics PCB and one year of Chemistry PCB. This course functions as a Biology survey while also building upon the student's prior learning within the interconnected PCB sequence. In this capstone course, cellular and molecular components of life are emphasized, along with genetics, ecology, and evolution. Anatomy and physiology (including dissection of a fetal pig) are covered, incorporating a deeper understanding of the chemical and physical aspects of these topics. Health and disease are also explored. Laboratory investigations follow the sequence of concepts covered, several of which involve quantitative analysis and interpretation of data. *This course fulfills the graduation requirement for biology.*

## AP Biology level 4

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: MINIMUM OF **THREE 2-LEVEL OR 3-LEVEL NON-ELECTIVE SCIENCE COURSES** (INCLUDING BIOLOGY AND CHEMISTRY) **OR** MINIMUM OF **TWO 4-LEVEL NON-ELECTIVE SCIENCE COURSES** (INCLUDING CHEMISTRY)

The AP Biology course is designed to meet the requirements specified by the College Board's Advanced Placement Biology curriculum. Both laboratory exercises and classroom work are emphasized, and the topics covered are the equivalent of those in a traditional college course, including cellular biology, organismic biology, genetics and development, health and disease, evolution, anatomy and physiology, biochemistry, behavior, and ecology. Formal lab reports are required as well as dissection of representative animals. Assessments in the form of assignments, laboratory practicals, quizzes, and tests are given on a regular basis. *This course fulfills the graduation requirement for biology.*

# Chemistry Courses

## Chemistry (Co-Taught) level 2

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: BIOLOGY AND ALGEBRA 1  
PLACEMENT BASED ON MATHEMATICS LEVEL

This laboratory course is an alternative to the traditional introductory chemistry course and is not intended for students planning on taking AP Chemistry in the future. A majority of the concepts covered in a typical chemistry course are presented but with less emphasis on related mathematical calculations. Cooperative group activities engage students in addressing issues involving science, technology, and society. A central goal is for students to develop a lifelong awareness of the potential and limitations of science. This course is co-taught by science and special education teachers. *This course fulfills the graduation requirement for physical science.*

## Chemistry level 2

OPEN TO SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: BIOLOGY OR ENVIRONMENTAL GEOSCIENCE AND ALGEBRA 1  
PLACEMENT BASED ON MATHEMATICS LEVEL

This course has a significant laboratory component. Although the topics of study are explored primarily in a qualitative fashion, there are some quantitative elements that require students to possess and apply basic math and algebra skills. The following chemical principles and concepts will be covered: states and properties of matter, basic atomic theory, periodic laws, chemical formulas and equations, basic chemical reactions, mole concepts, basic stoichiometry, thermochemistry, chemical bonding, and acids and bases. *This course fulfills the graduation requirement for physical science.*

## Chemistry level 3

OPEN TO SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: 3-LEVEL ALGEBRA 1 AND GEOMETRY OR CONCURRENT ENROLLMENT IN 3-LEVEL GEOMETRY  
PLACEMENT BASED ON MATHEMATICS LEVEL

This course has a significant laboratory component. Experimental work is designed to explore the topics of study qualitatively and quantitatively, and students study these concepts in some depth and at an accelerated pace. Topics include: states and properties of matter, atomic theory, periodic laws, chemical formulas and equations, chemical reactions, mole concepts, stoichiometry, matter and its changes, thermochemistry, chemical bonding, acids and bases, equilibrium, oxidation reduction, and descriptive chemistry. *This course fulfills the graduation requirement for physical science.*

## Chemistry level 4

OPEN TO SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: 4-LEVEL ALGEBRA 1 AND GEOMETRY OR CONCURRENT ENROLLMENT IN 4-LEVEL GEOMETRY  
PLACEMENT BASED ON MATHEMATICS LEVEL

This course has a significant laboratory component. Topics of study will be explored qualitatively, with a strong emphasis on quantitative analysis; therefore, students must possess strong math and algebra skills. Students study concepts in depth at an accelerated pace and are expected to work independently. The following chemical principles and concepts will be covered: states and properties of matter, atomic theory, periodic laws, chemical formulas and equations, chemical reactions, mole concepts, stoichiometry, matter and its changes, thermochemistry, chemical bonding, acids and bases, reaction kinetics, equilibrium, and oxidation reduction. *This course fulfills the graduation requirement for physical science.*

## Chemistry PCB levels 3 & 4

OPEN TO SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: PHYSICS PCB  
PLACEMENT BASED ON PHYSICS PCB LEVEL

This is the second course in the interconnected sequence of Physics-Chemistry-Biology. This laboratory course makes connections to the previous physics course and develops concepts to be used in biology. Students study concepts in depth at an accelerated pace. Experimental work is designed to explore the topics of study qualitatively and quantitatively. Topics include matter and its changes, chemical formulas and equations, stoichiometry, chemical equilibrium, oxidation reduction, thermochemistry, acid-base reactions, atomic theory, concepts of chemical bonding, introductory organic chemistry, the mole concepts, properties of all states of matter, periodic laws, biochemistry, and descriptive chemistry. *This course fulfills the graduation requirement for physical science.*

## AP Chemistry level 4

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: MINIMUM OF **THREE 2-LEVEL OR 3-LEVEL NON-ELECTIVE SCIENCE COURSES** (INCLUDING BIOLOGY AND CHEMISTRY) **OR** MINIMUM OF **TWO 4-LEVEL NON-ELECTIVE SCIENCE COURSES** (INCLUDING CHEMISTRY)

The AP Chemistry course is designed to meet the requirements specified by the College Board's Advanced Placement Chemistry curriculum. Students in this course should attain a depth of understanding of fundamentals and a reasonable competence in dealing with chemical problems. Topics include nomenclature, stoichiometry, gases, thermodynamics, atomic structure, molecular geometry, periodicity, bonding, condensed states, solutions, kinetics, acid-base equilibrium, solubility product equilibrium, electrochemistry, and descriptive chemistry. This college-level course in chemistry differs qualitatively from the usual first high school course in chemistry with respect to the kind of textbook used, the topics covered, the emphasis on chemical calculations and the mathematical formulation of principles, and the kind of laboratory work done by the students. Quantitative differences appear in the number of topics treated, the time spent on the course by students, and the nature and variety of experiments done in the laboratory.

# Environmental Geoscience Courses

## Survey of Physical Sciences (Co-Taught) level 2

OPEN TO SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: NONE  
PLACEMENT BASED ON ENGLISH AND MATHEMATICS LEVELS

Survey of Physical Sciences is a year-long, activity-oriented laboratory course. Topics include the scientific method, chemistry, physics, earth science, weather, and astronomy. Each unit includes reading of textbook material along with a variety of supporting activities, laboratory exercises, and demonstrations. *Students are also required to take Survey of Biology (Co-taught) to fulfill the two-year laboratory science graduation requirement. This course is offered every other year.*

## Environmental Geoscience (Co-Taught) level 2

OPEN TO FRESHMEN, SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: NONE  
FRESHMAN PLACEMENT BASED ON ENGLISH LEVEL

This laboratory course focuses on basic earth science topics and environmental issues. Course content includes the exploration of the processes of nature, which create valuable natural resources but also present humankind with natural hazards that affect the quality of our lives. Natural phenomena covered in the class include earthquakes, floods, storms, landslides, coastal erosion, and solar energy. In addition, the course explores how pollution and resource management affect society. Course work includes library research, writing, and classroom presentations. Laboratory work includes small-scale investigations (e.g., water testing and volcano modeling) and long-term projects (e.g., rocket design and earthquake engineering). This course is co-taught by science and special education teachers. *This course fulfills the graduation requirement for physical science.*

## Environmental Geoscience levels 9 & 4 on Northfield Campus levels 2, 3, & 4 on Winnetka Campus

OPEN TO FRESHMEN, SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: NONE  
FRESHMAN PLACEMENT BASED ON ENGLISH LEVEL

This laboratory course covers all of the Earth and space sciences: astronomy, geology, meteorology, and oceanography. The curriculum explores some of the most profound questions in science such as the origin and evolution of planet Earth, our place in the universe, and whether life exists elsewhere in the universe. Special focus is given to each of our planet's subsystems – water, air, land, and ice – and to the dynamic processes by which they interact. This course investigates the processes of nature that create valuable resources and produce natural disasters such as earthquakes, volcanic eruptions, tsunamis, hurricanes, and tornadoes. This course also explores some of the most pressing issues in science today such as the impact of anthropogenic activities on our planet, particularly in our atmosphere and oceans, and what steps can be taken to remedy the problems that have been created. Research projects, hands-on activities, and laboratory work are strongly emphasized. The integration of scientific principles with technology and engineering concepts occurs throughout the course in the form of design challenges (e.g., earthquake-resistant buildings, air-pressurized rockets, and submarines). Through the study of environmental geoscience, students will learn and apply basic chemistry, physics, and biology concepts to explain and understand natural phenomena. *This course fulfills the graduation requirement for physical science.*

## AP Environmental Science level 4

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: MINIMUM OF **THREE 2-LEVEL OR 3-LEVEL NON-ELECTIVE SCIENCE COURSES** (INCLUDING BIOLOGY AND A PHYSICAL SCIENCE) **OR** MINIMUM OF **TWO 4-LEVEL NON-ELECTIVE SCIENCE COURSES** (INCLUDING CHEMISTRY OR ENVIRONMENTAL GEOSCIENCE)

The AP Environmental Science course is designed to meet the requirements specified by the College Board's Advanced Placement Environmental Science curriculum. This laboratory course will explore ecosystem function, nutrient cycling, population dynamics (including the human population), renewable and non-renewable energy sources, pollution, global climate change, evolution, species interactions, human impacts on natural systems, conservation, and sustainability. Discussion of health and disease are also included. These topics are investigated via laboratory explorations, graphical and mathematical analysis, research, group projects, and student presentations. The class will take field trips to explore local ecosystems and to participate in conservation activities and service learning.

# Physics Courses

## Physics level 2

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: ALGEBRA 1 AND GEOMETRY  
PLACEMENT BASED ON MATHEMATICS LEVEL

Physics courses have similar content, differing only in the depth of treatment and mathematics used for each topic. This laboratory course includes the study of motion (kinematics and dynamics), energy, waves, electricity and magnetism, light, and additional topics. Although there is quantitative work in problems and laboratory exercises, the emphasis is on an understanding of the concepts and an application to everyday experience. *This course fulfills the graduation requirement for physical science.*

## Physics level 3

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: ALGEBRA 1 AND GEOMETRY; CONCURRENT ENROLLMENT IN ALGEBRA 2 RECOMMENDED  
PLACEMENT BASED ON MATHEMATICS LEVEL

Physics courses have similar content, differing only in the depth of treatment and mathematics used for each topic. This laboratory course includes the study of motion (kinematics and dynamics), energy, waves, electricity and magnetism, light, and additional topics. The ability to apply math and graphical models is developed as a part of the course. *This course fulfills the graduation requirement for physical science.*

## Physics PCB levels 3 & 4

OPEN TO FRESHMEN  
PREREQUISITE: ALGEBRA 1  
COREQUISITE: GEOMETRY OR 4-LEVEL ALGEBRA 2  
PLACEMENT BASED ON MATHEMATICS LEVEL

This is the first course in the interconnected sequence of Physics-Chemistry-Biology. This laboratory course is designed for students who plan to complete three or more years of science in high school. Topics include the study of motion (kinematics and dynamics), energy, electricity and magnetism, waves, light, and sound. Algebra is used frequently throughout this course. *This course fulfills the graduation requirement for physical science.*

## AP Physics 1 level 4

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: PLANE GEOMETRY AND A MINIMUM OF **THREE 2-LEVEL OR 3-LEVEL NON-ELECTIVE SCIENCE COURSES** (INCLUDING BIOLOGY AND CHEMISTRY) **OR 4 LEVEL CHEMISTRY**  
COREQUISITE: 4 LEVEL ALGEBRA 2 OR 4 LEVEL ANALYTIC GEOMETRY  
THIS COURSE IS NOT OPEN TO STUDENTS WHO HAVE COMPLETED A YEAR OF PHYSICS.

The AP Physics 1 course is designed to meet the requirements specified by the College Board's Advanced Placement Physics 1 curriculum. This laboratory course, equivalent to one semester of a college algebraic physics course, is a rigorous study of the concepts of physics, with a strong focus on mechanics. In addition, the curriculum includes topics such as electricity and magnetism, wave theory, and optics. Great emphasis is placed on discovery and inquiry-based lab exercises. Students must be proficient with algebra and trigonometry to be successful in this course; however, no knowledge of calculus is required. *This course is not open to students who have completed a year of physics.*

## AP Physics 1 & 2 level 4

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: MINIMUM OF **THREE 2-LEVEL OR 3-LEVEL NON-ELECTIVE SCIENCE COURSES** (INCLUDING BIOLOGY AND PHYSICS) **OR 4-LEVEL PCB PHYSICS AND PCB CHEMISTRY**

The AP Physics 1 and 2 course is designed to meet the requirements specified by the College Board's Advanced Placement Physics 1 and Physics 2 curricula. This laboratory course is equivalent to two semesters of a college algebraic physics course. At the completion of this course, students will be prepared to take both the AP Physics 1 and AP Physics 2 exams. This course is a rigorous study of the concepts of physics, which include mechanics, electromagnetism, wave theory, fluid mechanics, thermodynamics, nuclear and atomic theory, special relativity, and quantum mechanics. Great emphasis is placed on discovery and inquiry-based lab exercises. Students must be familiar with algebra and trigonometry to be successful in this course; however, no knowledge of calculus is required. This course builds on skills and knowledge gained in a previous physics course.

## AP Physics C level 4

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: MINIMUM OF **THREE 2-LEVEL OR 3-LEVEL NON-ELECTIVE SCIENCE COURSES** (INCLUDING BIOLOGY AND PHYSICS) **OR 4-LEVEL PCB PHYSICS AND PCB CHEMISTRY**  
NOTE: A CALCULUS COURSE MUST BE TAKEN CONCURRENTLY IF NOT COMPLETED PREVIOUSLY

The AP Physics C course is designed to meet the requirements specified by the College Board's Advanced Placement Physics C curriculum.

This is a calculus-based laboratory course equivalent to the first-year college course taken by chemistry, physics, and engineering majors, which covers classical mechanics and electromagnetism. The mechanics semester covers topics in linear and rotational kinematics, dynamics, momentum, energy, gravitation, and harmonic motion. The electromagnetism semester covers topics from fields and potential, DC circuits, capacitance, inductance, and Maxwell's equation in integral form. Extensive use of calculus is made in both derivations and problem solving.

# Elective Science Courses

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## Survey of Science and Society (Co-Taught) level 2

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OPEN TO SOPHOMORES, JUNIORS, AND SENIORS  
PREREQUISITE: NONE  
PLACEMENT BASED ON ENGLISH AND MATHEMATICS LEVELS

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Survey of Science and Society is a laboratory science course focused on how science impacts our lives. Themes may include: Science of Household Items, Transportation, Agriculture, Global Citizenship, Energy in Our World, and Science of the Outdoors. These themes, as well as current topics in science and technology, will be explored via laboratory exercises, research, presentations, individual and group projects, demonstrations, engineering challenges, and experiential learning. This course is co-taught by science and special education teachers. *This course is a science elective and does NOT fulfill the science graduation requirement.*

## Anatomy and Physiology level 9

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OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: BIOLOGY AND ONE YEAR OF PHYSICAL SCIENCE

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This full-year laboratory course is designed to acquaint the student with general anatomy and physiology presented through an evolutionary perspective. It is meant to engage students in the language and images of the human form. The structure and function of the body's systems will be investigated using microscopic investigations, laboratory exercises, and extensive animal dissections designed to give the student hands-on experience with different tissues and organ systems. Major topics will include human origins, histology, the body's organs and organ systems, homeostasis, development, disease diagnosis and treatment, medical imaging, and a culminating trip to a local university's cadaver lab. This course will help prepare students interested in medicine, nursing, research, EMT, physical therapy, pharmacy, sports training, and other related fields of study including art (human form), psychology, and/or anthropology. *This course does NOT fulfill the graduation requirement. This course is a science elective. Students who have taken Advanced Anatomy and Clinical Health Science cannot take this course.*

## Advanced Anatomy and Clinical Health Science level 4

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OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: BIOLOGY AND CHEMISTRY

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This full-year laboratory course is designed to acquaint the student with general anatomy and physiology presented through an applied clinical perspective. It is meant to engage students in the language and images of the human form. The structure and function of the body's systems will be investigated using microscopic investigations, laboratory exercises, and extensive animal dissections designed to give the student hands-on experience

with different tissues and organ systems. Major topics will include comparative morphology, cellular physiology and biochemistry, histology, the body's organs, organ systems, the interdependence of organ systems, health, development, injury/pathology, disease diagnosis and treatment, medical imaging, drug action, and a culminating trip to a local university's cadaver lab. Students will be expected to complete case study investigations and apply their understandings of the human body. This course will help prepare students interested in medicine, nursing, research, EMT, physical therapy, pharmacy, sports training, and other related fields of study including art (human form), psychology, and/or anthropology. *This course does NOT fulfill the graduation requirement. This course is a science elective. Students who have taken Anatomy and Physiology cannot take this course.*

## Applied Human Anatomy level 2

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OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: BIOLOGY AND ONE YEAR OF PHYSICAL SCIENCE

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In this one-semester laboratory course, students will explore the structure and function of the major systems in the human body. Students will learn about individual body systems and how they relate to one another. Additionally, students will explore how the science of the human body relates to their own experiences, ideas on popular culture around the human body, and emerging research on the human body. *This course does NOT fulfill the graduation requirement. This course is a science elective.*

## Astronomy levels 3 & 4

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OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: BIOLOGY AND ONE YEAR OF PHYSICAL SCIENCE  
PLACEMENT BASED ON MATHEMATICS LEVEL

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Topics covered in this laboratory course include the historical development of human thought and theories regarding Earth's place in the universe, the origin, composition, and properties of planets and other solar system objects (with emphasis on comparative aspects as they relate to Earth), and the structure and evolution of stars and galaxies. Some of the biggest questions in science are addressed, including the origin and fate of the universe, the nature and structures of quasars, pulsars, black holes and other extreme celestial objects, and the possibility of life elsewhere in the universe. Laboratory activities include robotic and model rocket challenges, practice with computer modeling programs, and interpretation of images taken by observatories using wavelengths across the electromagnetic spectrum. Participation in four to six early-morning or late-evening telescope viewing sessions held throughout the year is mandatory. Every attempt will be made to accommodate student schedules when planning the viewing sessions. The mathematics used in the course corresponds to the math level of the student. *This course is a science elective and does NOT fulfill the science graduation requirement.*

## Biomechanics & Sports Medicine level 9

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: ONE YEAR OF BIOLOGY AND ONE YEAR OF A PHYSICAL SCIENCE

This laboratory course focuses on key concepts in anatomy, physiology, kinesiology, biomechanics, and physical therapy. Central themes of the courses include the prevention, diagnosis, treatment, and rehabilitation of sports injuries. Students explore sport-science principles such as dynamic & ballistic motion, heart rate, VO<sub>2</sub> max, lactic acid production, and strength. Anatomy and physiology concepts are discussed throughout the year as they relate to the specific region of the body. This course is designed for students who are interested in the growing field of sports medicine and biomechanics. Participation on inter-scholastic or intramural athletic teams is not a prerequisite of the courses. *This course is a science elective and does NOT fulfill the science graduation requirement.*

## Forensic Science level 9

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: BIOLOGY AND ONE PHYSICAL SCIENCE COURSE

Forensic Science is a laboratory course that examines the application of laboratory science to criminal investigation. The role of the crime laboratory is presented in the context of forensic science. Students focus on crime-scene processing and the detection, collection, and presentation of evidence for examination and court use. Crime-scene recording, evidence collection, equipment and analysis, serology, anthropology, odontology, DNA, drugs, trace evidence, fingerprints, firearms, and entomology are some of the topics that are covered in this course. *This course is a science elective and does NOT fulfill the science graduation requirement.*

## Marine Biology level 9

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: BIOLOGY, ONE PHYSICAL SCIENCE COURSE, AND SIGNED COURSE AGREEMENT

NOTE: THERE IS AN ADDITIONAL FEE FOR SCUBA CERTIFICATION WITHIN ONE YEAR OF COMPLETION OF SCUBA COMPONENT OF THE COURSE; STUDENTS SPEND LAB PERIODS IN THE POOL AND ARE RELEASED FROM CERTAIN KW CLASSES DURING ONE QUARTER.

This laboratory course is designed to introduce students to marine ecosystems and organisms in a hands-on laboratory setting and to give them the skills needed to pursue an interest in marine science in the future. Topics explored include oceanography, marine life forms and ecosystems, and species interactions and evolution. The human impact on marine ecosystems is also addressed. These areas of study are explored through laboratory explorations, animal dissections, research, group projects, and presentations. Lab periods during one quarter of the course are spent in the New Trier pool with a PADI (scuba) instructor. Students complete the scuba classroom and pool dives during the quarter, and attendance is mandatory. *This course is a science elective and does NOT fulfill the science graduation requirement.*

## Zoology level 2

OPEN TO JUNIORS AND SENIORS  
PREREQUISITE: BIOLOGY AND ONE YEAR OF PHYSICAL SCIENCE

This one-semester laboratory course will explore the diversity of the animal kingdom. Students will explore the major phyla within the animal kingdom through the themes of adaptations and behaviors, evolution, diversity, human impact, and animal impact on changing ecosystems. *This course does NOT fulfill the graduation requirement. This course is a science elective.*

# EL Science Courses

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## EL Chemistry level 9

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OPEN TO STUDENTS WHO HAVE LIMITED PROFICIENCY IN ENGLISH  
PREREQUISITE: RECOMMENDATION OF DEPARTMENT AND EL COORDINATOR

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This laboratory course covers the major units of a standard chemistry course, including states and properties of matter, basic atomic theory, periodic laws, chemical formulas and equations, chemical reactions, mole concepts, stoichiometry, matter and its changes, thermochemistry, chemical bonding, and acids and bases. The course follows a sequence that emphasizes mathematical knowledge as students develop their language skills. In addition, the course focuses on science vocabulary and writing skills. *This course fulfills the graduation requirement for physical science.*

## EL Biology level 9

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OPEN TO STUDENTS WHO HAVE LIMITED PROFICIENCY IN ENGLISH  
PREREQUISITE: RECOMMENDATION OF DEPARTMENT AND EL COORDINATOR

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This activity-based laboratory course focuses on five major themes: ecology, cellular biology and genetics, evolution, taxonomy, and human anatomy and physiology (including dissection of a fetal pig). Health and disease are also explored. Each area is explored in detail through laboratory exercises, library and online research, group projects, and presentations. All students observe and participate in the same activities regardless of their English proficiency. Meaningful, interactive, problem-solving experiences that develop language skills are used. *This course fulfills the graduation requirement for biology.*

# SCIENCE

## Course Classifications

Each course has a six-digit number. The fifth digit, “3” identifies the semester(s) the course is offered; full-year courses are assigned a “3” to represent both semesters. The sixth digit indicates the level.

### Northfield Campus

Biology (Co-Taught).....	N710232
Biology .....	N710132
Biology .....	N710133
Biology .....	N710134
Environ Geoscience (Co-Taught) .....	N720232
Environ Geoscience.....	N720139
Environ Geoscience.....	N720134
Physics PCB .....	N740133
Physics PCB .....	N740134

### Winnetka Campus

Chemistry (EL) .....	W701039
Biology (EL) .....	W710039
Survey of Physical Science (Co-Taught).....	W705232
Survey of Biology (Co-Taught) .....	W704232
Survey of Science and Society (Co-Taught) ....	W706232
Biology (Co-Taught).....	W710232
Biology .....	W710132
Biology .....	W710133
Biology .....	W710134
Biology PCB.....	W710333
Biology PCB.....	W710334
AP Biology .....	W710434
Adv Anatomy and Clinical Health Science.....	W711334
Anatomy/Physiology .....	W711239
Marine Biology.....	W713339
Forensic Science .....	W714339
Biomechanics & Sports Med.....	W716339
Astronomy .....	W720333
Astronomy .....	W720334
Environ Geoscience.....	W720132
Environ Geoscience.....	W720133
Environ Geoscience.....	W720134
Environ Geoscience (Co-Taught) .....	W720232
AP Environ Science.....	W720434
Chemistry (Co-Taught) .....	W730332
Chemistry.....	W730232
Chemistry.....	W730233
Chemistry.....	W730234
Chemistry PCB.....	W731233
Chemistry PCB.....	W731234
AP Chemistry.....	W730434
Physics .....	W740332
Physics .....	W740333
AP Physics 1.....	W742434
AP Physics 1 & 2.....	W740414 & W740424
AP Physics C.....	W741434
Applied Human Anatomy.....	W716202
Zoology.....	W713302

### Early Bird Courses (Winnetka Only)

Biology PCB (EB) .....	W71B333
Biology PCB (EB) .....	W71B334
AP Biology (EB) .....	W71E434
Anatomy/Physiology (EB) .....	W71E239
Environ Geoscience (EB).....	W72E133
Chemistry (EB).....	W73E233
Chemistry (EB).....	W73E234
AP Chemistry (EB).....	W73E434
Chemistry PCB (EB).....	W73B233
Chemistry PCB (EB).....	W73B234
Physics (EB) .....	W74E333
AP Physics C (EB).....	W74E534

# Social Studies

World History  
World History-Team: World Studies  
Modern World History  
World Geography  
Civics  
Civics and Social Justice  
Urban Design and Civic Engagement  
United States History  
AP United States History  
United States History - Team: American Studies  
IGSS US History  
Psychology  
Topics of Psychology and Sociology  
Sociology in Action  
Philosophy  
Economics  
Law and Justice  
Civil Rights and Social Protest in Modern America  
Current Issues

AP African American Studies  
AP Economics  
AP European History  
AP Psychology  
AP Government and Politics  
Art History  
IGSS Global Concerns  
Independent Study Social Studies Seminar  
Chicago History  
Leadership in Social Justice  
Freshman Speech and Debate  
Public Speaking and Strategic Communication  
Congressional Debate 1, 2, & 3  
Lincoln-Douglas Debate 1, 2, & 3  
Policy Debate 1, 2, & 3  
Public Forum Debate 1, 2, & 3