

Science

Survey of Biology-Enriched

Biology-Enriched

Biology

Biology PCB

AP Biology

Chemistry-Enriched

Chemistry

Chemistry PCB

AP Chemistry

Survey of Physical Sciences-Enriched

IGSS Integrated Environmental Science

Environmental Geoscience

AP Environmental Geoscience

Physics

Physics PCB

AP Physics 1

AP Physics 1 & 2

AP Physics C

Advanced Topics in Physical Sciences

Anatomy and Physics

Astronomy

Biomechanics and Sports Medicine 1 & 2

Forensic Science

Environmental Geoscience-Enriched

Marine Biology

Biology (ELL)

ELL Science Resource

Introduction to Science (ELL)

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; and
- Use the inquiry process of science that includes recognition of natural phenomena, collection of data, and testing of hypotheses using experiments.

GRADUATION REQUIREMENTS

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

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.

All courses in this department receive major credit (0.5 credit/semester or 1.0 credit/year).

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)

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.

- Advanced Topics in Physical Sciences
- Anatomy & Physiology
- Astronomy
- Biomechanics and Sports Medicine 1 & 2
- Forensic Science
- IGSS Integrated Environmental Science
- Marine Biology

Except for IGSS Integrated Environmental 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.**

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 every day from 7:10 a.m. to 8:05 a.m.**

SUMMER SCHOOL

Selected science courses are offered in summer school; please refer to the Summer School Brochure. AP and 2-level courses are not offered during summer school.

Biology Courses

Survey of Biology-Enriched 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. *Students are also required to take Survey of Physical Sciences-Enriched to fulfill the two-year laboratory science graduation requirement. This course is offered every other year.*

Biology-Enriched 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. 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 NON-ELECTIVE SCIENCE COURSES AT LEVEL 2 OR 3** (INCLUDING BIOLOGY AND CHEMISTRY) AND A PARENT REQUEST OR TEACHER RECOMMENDATION FOR LEVEL CHANGE **OR** **MINIMUM OF TWO NON-ELECTIVE SCIENCE COURSES AT LEVEL 4** (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.

Chemistry Courses

Chemistry-Enriched level 2

OPEN TO JUNIORS AND SENIORS
PREREQUISITE: BIOLOGY AND ALGEBRA
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 (WITH DEPARTMENTAL APPROVAL), JUNIORS, AND SENIORS
PREREQUISITE: BIOLOGY OR ENVIRONMENTAL GEOSCIENCE AND ALGEBRA
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 concept, 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 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 concept, 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 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 concept, 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 level 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 concept, 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 NON-ELECTIVE SCIENCE COURSES AT LEVEL 2 OR 3** (INCLUDING BIOLOGY AND CHEMISTRY) AND A PARENT REQUEST OR TEACHER RECOMMENDATION FOR LEVEL CHANGE **OR** MINIMUM OF **TWO NON-ELECTIVE SCIENCE COURSES AT LEVEL 4** (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-Enriched 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-Enriched to fulfill the two-year laboratory science graduation requirement. This course is offered every other year.*

Environmental Geoscience-Enriched 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 NON-ELECTIVE SCIENCE COURSES AT LEVEL 2 OR 3** (INCLUDING BIOLOGY AND A PHYSICAL SCIENCE) AND A PARENT REQUEST OR TEACHER RECOMMENDATION FOR LEVEL CHANGE **OR** MINIMUM OF **TWO NON-ELECTIVE SCIENCE COURSES AT LEVEL 4** (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 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
CO-REQUISITE: 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: MINIMUM OF **THREE NON-ELECTIVE SCIENCE COURSES AT LEVEL 2 OR 3** (INCLUDING BIOLOGY AND CHEMISTRY) AND A PARENT REQUEST OR TEACHER RECOMMENDATION FOR LEVEL CHANGE **OR** MINIMUM OF **TWO NON-ELECTIVE SCIENCE COURSES AT LEVEL 4** (INCLUDING CHEMISTRY)

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 familiar 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 NON-ELECTIVE SCIENCE COURSES AT LEVEL 2 OR 3** (INCLUDING BIOLOGY AND PHYSICS) AND A PARENT REQUEST OR TEACHER RECOMMENDATION FOR LEVEL CHANGE **OR PCB PHYSICS AND PCB CHEMISTRY AT LEVEL 4**

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.

AP Physics C level 4

OPEN TO JUNIORS AND SENIORS
PREREQUISITE: MINIMUM OF **THREE NON-ELECTIVE SCIENCE COURSES AT LEVEL 2 OR 3** (INCLUDING BIOLOGY AND PHYSICS) AND A PARENT REQUEST OR TEACHER RECOMMENDATION FOR LEVEL CHANGE **OR PCB PHYSICS AND PCB CHEMISTRY AT LEVEL 4**
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

Advanced Topics in Physical Science level 2

OPEN TO JUNIORS AND SENIORS
PREREQUISITE: BIOLOGY AND 1 YEAR PHYSICAL SCIENCE

Advanced Topics in Physical Science is a laboratory science course focused on six major themes: 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 at various sites. *This course is a science elective and does NOT fulfill the science graduation requirement.*

Anatomy and Physiology levels 9 & 4

OPEN TO JUNIORS AND SENIORS
PREREQUISITE: ONE YEAR OF BIOLOGY AND ONE YEAR OF PHYSICAL SCIENCE AT LEVEL 9 OR 3 **OR** ONE YEAR OF BIOLOGY AND ONE YEAR OF CHEMISTRY AT LEVEL 4
PLACEMENT BASED ON PRIOR BIOLOGY LEVEL

This full-year laboratory course is designed to acquaint students with general anatomy and physiology presented through an evolutionary perspective. It is meant to engage students and make them functionally literate in the language and images of the human form. The structure and function of the body's systems are investigated using microscopic examinations, laboratory exercises, and extensive dissections designed to give students hands-on experience with different tissues and organ systems. Major topics include human origins, histology, the body's organs and organ systems, homeostasis, health, development, injury and pathology, disease diagnosis and treatment, medical imaging, and drug action. The course culminates with a trip to a local university's cadaver lab. Students are expected to complete case study investigations and apply their understanding 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 is a science elective and does NOT fulfill the science graduation requirement.*

Astronomy levels 3 & 4

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

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 1 & 2 level 9

PREREQUISITE: ONE YEAR OF BIOLOGY AND ONE YEAR OF A PHYSICAL SCIENCE
NOTE: BIOMECHANICS & SPORTS MEDICINE I IS A ONE-SEMESTER COURSE OFFERED DURING 1ST SEMESTER; BIOMECHANICS & SPORTS MEDICINE II IS A ONE-SEMESTER COURSE OFFERED DURING 2ND SEMESTER.
STUDENTS ARE ENCOURAGED TO TAKE BIOMECHANICS & SPORTS MEDICINE I BEFORE II BUT ARE NOT REQUIRED TO DO SO.

These courses focus 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, VO₂ max, lactic acid production, and strength. Anatomy and physiology concepts are discussed throughout the semester as they relate to the specific region of the body. These courses are designed for students who are interested in the growing field of sports medicine and biomechanics. Participation on interscholastic 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.*

IGSS Integrated Environmental Science levels 4 & 9

OPEN TO JUNIORS AND SENIORS
PREREQUISITE: BIOLOGY OR ONE YEAR OF PHYSICAL SCIENCE; APPLICATION REQUIRED

The Integrated Global Studies School Environmental Science course not only emphasizes many of the scientific concepts from traditional biology, chemistry, environmental science, geoscience, and physics courses but also connects scientific concepts of each discipline. To promote scientific literacy at the local, national, and global levels, the course highlights the interactions between the atmosphere, hydrosphere, bio-sphere, and lithosphere. With particular attention on the positive and negative interactions of the human population with the environment, IGSS Environmental Science allows students to explore, question, and grow as scientific thinkers and conscientious citizens. Throughout the course, students participate in a wide range of activities, including hands-on laboratories, field studies, current and historical readings, analysis of scientific data, research, debates, writing, and problem solving of real-world issues. These activities help students become more competent and independent in the design, analysis, and communication of issue-oriented science. Students are challenged to connect the various components of the course as they analyze risks, assess trade-offs, and make decisions based on experience and scientific data, thereby acquiring the skills necessary for making decisions critical to their future and to the future of other living things on Earth. *Although this course is a science elective, it DOES fulfill the graduation requirement for physical science.*

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, 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.*

ELL Science Courses

Biology (ELL) level 9

OPEN TO STUDENTS WHO HAVE LIMITED ENGLISH LANGUAGE PROFICIENCY
PREREQUISITE: RECOMMENDATION OF DEPARTMENT AND ELL COORDINATOR

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.*

ELL Science Resource level 8

OPEN TO STUDENTS WITH LIMITED ENGLISH PROFICIENCY
PREREQUISITE: NONE

This course serves English Language Learners as they transition into mainstream science classes. The course helps students prepare for units by making connections to background knowledge from their previous science classes. Students also identify new vocabulary in advance of each chapter and learn strategies for memorizing and using the terms in speaking and writing. In addition, the teacher will review the expectations of laboratory-based science and the steps for writing a lab report. The teacher will be in contact with the classroom science teacher, but students are expected to develop their own self-advocacy skills. This course is taken in addition to a mainstream science class on non-lab days. Enrollment is based on placement by the ELL Coordinator.

Introduction to Science (ELL) level 9

OPEN TO STUDENTS WITH LIMITED ENGLISH PROFICIENCY
PREREQUISITE: NONE

This laboratory course is designed to teach basic scientific concepts in the biological and physical sciences to students of varied ability levels with limited English proficiency. The course is activity oriented and project based. All students observe and participate in the same activities regardless of their English proficiency. Students research and present material to the class on a regular basis. Meaningful, interactive, problem-solving experiences that develop language skills are used. All language exercises relate to the science activities in which the students participate. *This course does NOT fulfill the science graduation requirement or AP prerequisite.*

SCIENCE

Course Classifications

Each course has a six-digit number. For example, the course number for AP Biology is “710434.” The first three digits, “700,” identify the department. The fourth digit, “4,” indicates the year the course is usually taken. 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, “4,” indicates the level. (An “E” or “B” in the third position indicates “Early Bird.”)

Northfield Campus

Biology-E (Co-Taught).....	710232
Biology	710132
Biology	710133
Biology	710134
Environ Geoscience-E (Co-Taught).....	720232
Environ Geoscience.....	720139
Environ Geoscience.....	720134
Physics PCB.....	740133
Physics PCB.....	740134

Winnetka Campus

ELL Science Resource.....	700138
Survey of Biology.....	704232
Survey of Physical Science.....	705232
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Biology	710133
Biology	710134
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Biology PCB.....	710334
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Marine Biology.....	713339
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AP Chemistry.....	730434

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Biology PCB (EB).....	71B334
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Anatomy/Physiology (EB)	71E239
Environ Geoscience (EB).....	72E133
Chemistry (EB).....	73E233
Chemistry (EB).....	73E234
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Chemistry PCB (EB).....	73B234
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AP Physics 1 & 2.....	74E634
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