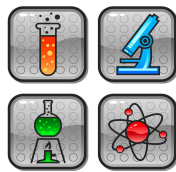


# Science



- Academy of Life Science

Students will explore various areas of interest concerning life, earth and physical sciences. Laboratory oriented courses will enable students to use reason, memory, imagination and the scientific method of inquiry. Students will learn the basic principles of each subject area and will be helped to apply these concepts to everyday life as well as to future studies. Course selections are designed to accommodate the capabilities and backgrounds of each student. Any student planning on attending a four year college should take four years of Regents/AP Science courses.

## COURSE OFFERINGS

<u>Course</u>	<u>Credit</u>	<u>Length</u>	<u>Type of Exam</u>
Physical Setting/Earth Science with Lab	1 unit	40 weeks	Regents
Living Environment/Biology with Lab	1 unit	40 weeks	Regents
Living Environment/Biology with Lab-Enriched	1 unit	40 weeks	Regents
AP Biology	1 unit	40 weeks	Regents & AP
Physical Setting/Chemistry with Lab	1 unit	40 weeks	Regents
General Chemistry	1 unit	40 weeks	Local
Adv. Forensics (SUPA Syracuse Univ. Project Adv) (West)	1 unit	40 weeks	SU
Forensic Science	1 unit	40 weeks	Local
HC (Hilbert College) Forensics (East)	1 unit	40 weeks	Local
Physical Setting/Physics with Lab	1 unit	40 weeks	Regents
Science for the 21st Century	1 unit	40 weeks	Local
AP Chemistry	1 unit	40 weeks	Local & AP

### Physical Setting/Earth Science with Lab

Credit: 1 Unit      Length: 40 Weeks

This course includes: Geology, Meteorology, Astronomy and Environmental Awareness topics. Emphasis is placed on the use of scientific inquiry to develop explanations of natural phenomena. The course will culminate with a Regents exam in June which will include a lab performance test. As a prerequisite for admission to the Regents exam, students must have successfully

completed 1200 minutes of laboratory experience with satisfactory written reports for each laboratory investigation.

### Physical Setting/Physics with Lab

Credit: 1 Unit      Length: 40 Weeks

Prerequisite: Successful completion of Algebra and Geometry and Alg 2 CC or currently enrolled in Alg 2CC

The Regents Physics course presents a modern view of Physics with major emphasis placed on the topics of mechanics, waves,

electricity, the standard model of the atom, and modern Physics. The course will culminate with a Regents exam in June. As a prerequisite for admission to the Regents exam, students must have successfully completed 1200 minutes of laboratory experience with satisfactory written reports for each laboratory investigation.

### Physical Setting/Chemistry with Lab

Credit: 1 Unit

Length: 40 Weeks

Prerequisite: Successful completion of Algebra and Geometry CC or currently enrolled in Geometry CC

The Regents Chemistry course focuses on the study of our physical world. An emphasis is placed on developing students' understanding of scientific concepts, relationships, processes, mechanisms and models that explain phenomena related to matter and energy. This course allows students to apply their developing understanding of the physical world in ways that challenge their critical thinking and creative reasoning skills. The course will culminate with a Regents exam in June. As a prerequisite for admission to the Regents exam, students must have successfully completed 1200 minutes of laboratory experience with satisfactory written reports for each laboratory investigation.

### Living Environment/Biology with Lab

Credit: 1 Unit

Length: 40 Weeks

The study of living things. Learning experiences will communicate to the student an awareness of the biological phenomena taking place in him/herself and the environment around them.

Topics covered include: Unity and Diversity, Reproduction, Evolution, Genetics, Dynamic Equilibrium, Interdependence of Organisms and their Environment, and Human Impact on the Environment. There is a strong emphasis on Scientific Inquiry. The course

will culminate with a Regents exam in June. As a prerequisite for admission to the Regents exam, students must have successfully completed 1200 minutes of laboratory experience with satisfactory written reports for each laboratory investigation.

### Living Environment with Lab Enriched

Credit: 1 Unit

Length: 40 Weeks

Prerequisite: Teacher recommendation. It is recommended that students should have an 85% or higher on the NYS Regents Earth Science exam. This course is designed for talented ninth grade students who, upon completion of this course, are expected to enroll in the AP program designed for the academically talented students in science. While preparing students for the Regents Living Environment Examination, Enriched Living Environment challenges students to develop an in-depth understanding of biology (cellular biology, human physiology, genetics, evolution, and ecology) with the addition of basic chemical concepts, as well (atomic structure, bonding, periodic table). This curriculum provides students with opportunities to challenge themselves beyond the Regents Living Environment program through scientific inquiry, laboratory investigations and out of class experiences. The course will culminate with a Regents exam in June. As a prerequisite for admission to the Regents exam, students must have successfully completed 1200 minutes of laboratory experience with satisfactory written reports for each laboratory investigation.

### General Chemistry

Credit: 1 Unit

Length: 40 Weeks

General Chemistry focuses on the study of our physical world. An emphasis is placed on developing students' understanding of scientific concepts, relationships, processes,

mechanisms and models that explain phenomena related to matter and energy. This course allows students to apply their developing understanding of the physical world in ways that challenge their critical thinking and creative reasoning skills. The course will culminate with a Local exam in June. There is no laboratory component to this course.

### Science for the 21st Century

Credit: 1 Unit                      Length: 40 Weeks  
Prerequisite: Counselor and teacher recommendation.

Science for the 21<sup>st</sup> Century is a third-year science elective with an emphasis on an introduction to conceptual Physics, Chemistry and Environmental Science. Research, communication and writing skills are practiced in a project-based format to allow students to enhance their abilities before applying these skills in real life situations. The class is constructed around the idea that real world learning is interrelated and interdependent. At times all areas of science are encompassed to allow for the development of problem-solving skills through organization and analysis of data to arrive at work related conclusions. Students who successfully complete the course will take a district exam and receive 1 unit of science credit. Science for the 21<sup>st</sup> Century is a third-year science course to be taken after successful completion of Living Environment and Earth Science.

### Adv.Forensic Science - SUPA (Syracuse Univ Project Adv.) (West)

Credit: 1 Unit                      Length: 40 Weeks  
Prerequisite: Teacher recommendation and successful completion of Regents Chemistry or Regents Physics.

Forensic Science is focused upon the application of scientific methods and

techniques to crime and law. Recent advances in scientific methods and principles have had an enormous impact upon law enforcement and the entire criminal justice system. In this course, scientific methods specifically relevant to crime detection and analysis will be presented. Emphasis is placed upon understanding the science behind the techniques used in evaluating physical evidence. Topics included are blood analysis, organic and inorganic evidence analysis, microscopic investigations, hair analysis, DNA, drug chemistry and toxicology, fiber comparison, glass composition and fragmentation, fingerprints, soil comparisons, and forensic anthropology, among others. This hands-on course is designed for seniors looking to further their studies in science.

A college level textbook is utilized throughout the course. There is a fee of \$115/credit payable to Syracuse University to register for this course (\$460). Students who successfully complete the course with a 73 or higher will receive 4 college credit hours, transferable to most institutions.

### Forensic Science

Credit: 1 Unit                      Length: 40 Weeks  
Prerequisite: Regents Chemistry or Regents Physics or Chemistry for Life Science with teacher recommendation, or simultaneously enrolled in Regents Chemistry or Physics.

This course is based on the scientific methods used to solve crimes within the scope of the law. It is intended to provide an introduction to understanding the science behind crime detection. Emphasis is placed upon understanding the science behind the techniques used in evaluating physical evidence. Topics included are blood analysis, microscopic investigations, hair analysis, DNA, drug chemistry and toxicology, fiber comparisons, and fingerprints, among others. This hands-on course is designed for

seniors looking to further their studies in science. It is taught at a college level intensity and closely mirrors the SUPA Forensics course and will be challenging. A high school level textbook is used in conjunction with this course.

### Biology AP

Credit: 1 Unit

Length: 40 Weeks

Prerequisite: Teacher recommendation and student should be enrolled in or successfully completed Algebra CC. Recommended that students have an 85% or higher on the NYS Living Environment Regents exam

The Advanced Placement course in Biology fulfills the requirements of a General Biology course on the college level. The concepts of Biology will be presented using a cellular and evolutionary approach, with accompanying laboratory exercises. For those students taking Biology AP as a first year Biology course, they will also take the NYS Regents Examination. There is a fee payable to the College Board to sit for the AP exam, a requirement for this course.

### HC Forensic Science (East)

Credit: 1 Unit

Length: 40 Weeks

Prerequisite: Teacher recommendation and successful completion of Regents Chemistry or Regents Physics.

Forensic Science is focused upon the application of scientific methods and techniques to both civil and criminal law. Recent advances in scientific methods and principles have had an enormous impact upon law enforcement and the entire criminal justice system. In this course, scientific methods specifically relevant to crime detection and analysis will be

presented. Emphasis is placed upon understanding the science behind the techniques used in evaluating physical evidence. Topics included are blood analysis, organic and inorganic evidence analysis, microscopic investigations, hair analysis, DNA, drug chemistry and toxicology, fiber comparison, glass composition and fragmentation, fingerprints, soil comparisons, and forensic anthropology, among others. This hands-on course is designed for seniors looking to further their studies in science.

There is a \$200 fee payable to Hilbert College to register for the course. Students who successfully complete the course will receive 3 college credits through Hilbert College.

### Chemistry AP

Credit: 1 Unit

Length: 40 Weeks

Prerequisite: Teacher recommendation and successful completion of Regents Chemistry, Algebra, Geometry, and Alg 2 CC or currently enrolled in Alg 2 CC. Recommended that students have an 85% or higher on the NYS Living Environment and Earth Science Regents exams.

The Advanced Placement course in Chemistry fulfills the requirements of a college level General Chemistry course. The course will provide an in-depth coverage of general chemical principles with advanced laboratory techniques. It stresses a much higher level of problem solving difficulty than the Regents Chemistry course and requires a better understanding of basic math concepts. There is a fee payable to the College Board to sit for the AP exam, a requirement for this course. There will be a local

## **Science Honor Society**

The Science Honor Society of the WSCSD is an exclusive organization that recognizes outstanding success in the sciences and promotes service to the school and local community.

The requirement(s) for Provisional Membership acceptance into the organization are:

- Students must successfully complete a minimum of two Regents\* or two AP science courses or a combination thereof, at the high school. Student performance at the middle school is not considered because this is strictly a high school organization; and

The requirement(s) for maintenance for Permanent Membership are:

- Students are required to maintain a minimum 90% cumulative average in Regents Level Science courses, or minimum 85% in AP science courses, Adv Forensics, Life Science Academy courses and
- Students must achieve mastery level (85% or higher) on ALL NYS Science Regents exams that are taken while at the high school and
- Students must be enrolled in at least one science course each year school year during all four years of high school and
- Students must log a minimum of 20 service hours over a two school year period: 10 hours of which must be completed while volunteering at school events or assisting in the science department and

Successful completion of the above criteria earns "Honor Cords" to be kept and worn at High School Graduation and Permanent Membership status into the Science Honor Society.

# Academy of Life Science

Admissions to this school-within-a-school program is competitive. Students supplement their Regents program with a combination of medical courses and biotechnology. This path requires extra science coursework beyond Regents requirements. A college course is required along with an internship in a field related to career interests. It is recommended that students have an 85 average in Math and science to be accepted and successful in the Academy of Life Science.

## Academy Course Sequence

• Three Year Program •

<u>Grade Level</u>	<u>Course</u>	<u>Credit</u>
Ninth Grade-Recruitment, application, and selection of students	Science	1 unit
Tenth Grade	Medical Terminology	1 unit
	Science	1 unit
Eleventh Grade	Medical Ethics	½ unit
	Microsoft Office for the Medical Professional	½ unit
	College and Career Portfolio	½ unit
	Science	1 unit
Twelfth Grade* (select 2 of 3 science courses)	Biotechnology (West)	1 unit
	Anatomy and Physiology	1 unit
	Regents Physics/AP Science Course	1 unit
	Local College Course	College Credit
	Internship	½ - 1 unit

~Students are required to take a minimum of 5 credits of Science from the following course list:

Choose 3 of the following Courses:

- Earth Science with Lab
- Earth Science with Lab Enriched
- Living Environment/Biology with Lab
- Living Environment/Biology with Lab ENriched
- AP Biology
- Chemistry with Lab
- Adv Forensics (SUPA) (West)
- HC Forensics (East)
- AP Chemistry

\*Choose 2 of the following courses:

- Physics with Lab
- Biotechnology (West)
- Anatomy and Physiology

\*Any Life Science Academy Student that earns a 3, 4 or 5 on an AP Science Exam in their Sophomore or Junior year can be waived from taking a college course.

\*This academy program does not meet the requirements for a world language bypass for the Advanced Designation Diploma

The Academy is supported by an Advisory Board which currently includes the following companies, organizations and colleges:

West Seneca Central Schools • Greatbatch, Inc. • Canisius College Medical Laboratory • The Binding Site • IMMCO Diagnostics, Inc. • Trocaire College • Caplugs • David Clifford, M.C., ABFP • Computer Task Group • ZeptoMetrix Corp. • Niacet Corporation • SciBiz International • Tapecon • Mentholatum • TMP Technologies, Inc. • Kinex • Advantage Home Telehealth • Ivoclar Vivadent • Clinical Support Services, LLC. • Western New York Independent Living • Aerotek • Niagara University • ECC • University of Buffalo • HWI • Polymer Conversions, Inc. • Roswell Park Cancer Institute • AirSep Corp./Chart Industries • Surgical Repairs International • Evolution Dental • VWR • Value Centric, LLC • Honeywell • Superior Group • Sefar Filtration, Inc. • Kinex • Great Lakes Orthodontics, Ltd. • Reichart, Inc. • Buffalo BioBlower Technologies, Ltd. • Audobon Machinery, Company • Rheonix • AccuMed. • Precision Scientific Instruments • ParMed Pharmaceuticals, Inc. • QuadPharma • VIP/VAL Med Pharmaceuticals, Inc. • Praxair • Buffalo Filter • Life Technologies • AHRM, Inc. • Applied Medical Coating • Harker Bio • SR Instruments, Inc. • Frontier Science and Technology • NYS Center for Excellence. • Kinex • AndroBiiSys, Inc. • Harmac Medical Products, Inc. • Accelent, Inc. • The Jacobs Institute • Plastic Weld Systems • TNT Moborg International, LTD • American Dental Partners, WNY • Safetec of America, Inc. • Fresenius-Kabi

### Anatomy and Physiology

Credit: 1 Unit Length: 40 Weeks

Anatomy and Physiology is an advanced Life Science course designed primarily for students in the Life Science Academy.

Anatomy and Physiology is a well-established component of a comprehensive life science program and, as such, will focus on the structure and function of cells, tissues, organs and organisms. Students will be required to identify anatomical structures and demonstrate an understanding of their functions. This course is required for Life Science Academy students in the Laboratory Science strand and Regents Biology and Regents Chemistry are prerequisites.

### Medical Law and Ethics

Credit: 1/2 Unit Length: 20 Weeks

Medical Law and Ethics provides an overview of the laws and ethics a student should know to help them provide competent, compassionate care to patients and complete life science related research that is within acceptable legal and ethical boundaries. The course will provide guidance to help resolve the many legal and ethical questions a student may reasonably expect to encounter. This is a required

course for students in the Life Science Academy and recommended for any student planning to pursue a career in Life or Health Sciences.

### Biotechnology (West Senior)

Credit: 1 Unit Length: 40 Weeks

Biotechnology is an advanced Academy of Life Science course designed primarily for students enrolled in the academy. The course encourages students to apply their knowledge of biology to investigate useful products and process produced within the Life Sciences/Health Science industries. There is an emphasis on laboratory skills, analyzing data, and communicating results. Topics covered include Microbiology, DNA, Genetic Engineering, Polymerase Chain Reaction, Proteins, Immunology, and Research. Priority given to AOLS students. Regents Chemistry is a prerequisite.

### Medical Terminology

Credit: 1 Unit Length: 40 Weeks

A course for students interested in health sciences professions designed to provide skill in understanding and using medical terms. This course introduces the fundamentals of word analysis, orientation

to the body as a whole and common prefixes and suffixes. Anatomic and physiologic terminology, pathological terminology, clinical procedures, laboratory tests, abbreviations and correct spelling and pronunciation of medical terms relating to the body systems are stressed. Many body systems are included, such as digestive, urinary, male and female reproductive, nervous and cardiovascular systems.

This portfolio can be used for college applications and interviews, for scholarship applications and for workforce interviews.

### Microsoft Office for the Medical Professional

Credit: 1/2 Unit

Length: 20 Weeks

Students enrolled in this course will receive the necessary skills to gain knowledge and understanding in using Microsoft Office. Students will learn how to enhance the visual display and clarity of their documents. The skills learned in this course will assist students throughout high school, college, and beyond. Students can earn a Microsoft Office certification in Word, Powerpoint and Excel. These certificates and testing will occur during class.

### College and Career Portfolio

Credit: 1/2 Unit

Length: 20 Weeks

This hands-on course will introduce students to the application of multimedia technology in the workplace. The course will explore evolving technologies including electronic presentations, Internet exploration, and desktop publishing while highlighting the interpersonal skills vital to a successful career. The Business and Education Employability Portfolio, an electronic portfolio, will be compiled highlighting the student's exemplary work and extracurricular activities during high school. The student's career exploration, personal profile and academic records will also be included in the portfolio.