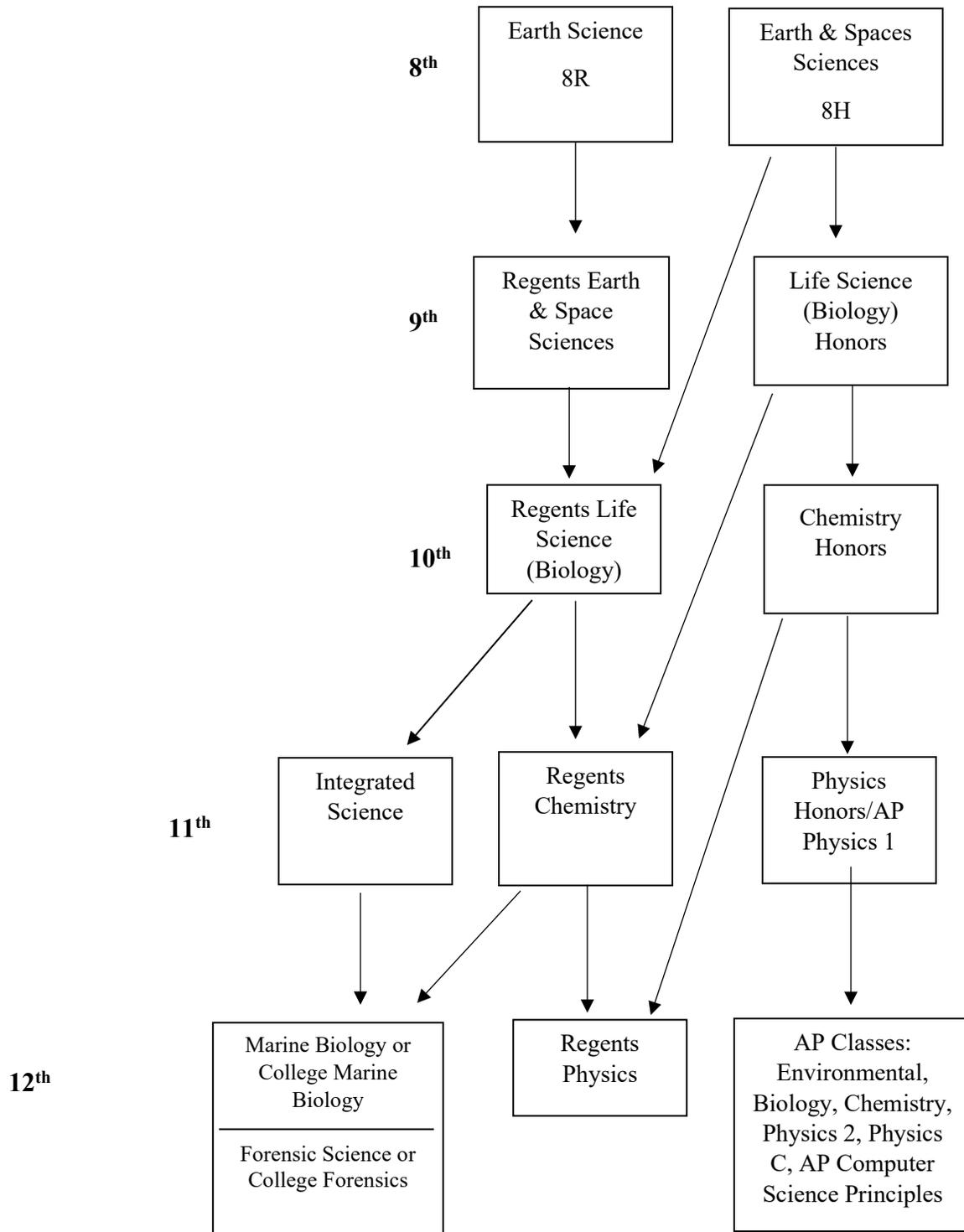


SCIENCE DEPARTMENT



****AP Computer Science Principles can be taken in any grade level****

SCIENCE DEPARTMENT

Grades 9, 10, 11, 12

SCIENCE COURSES ENDING IN A REGENTS EXAM

Each of the following courses closely follows the corresponding New York State Science Learning Standards, which is aligned with the New York State Standards. Each course requires a minimum of 1200 minutes of laboratory experience and satisfactory lab reports documenting those activities. Included in the 1200 minutes are required state labs. Students not meeting the 1200 minutes and/or not completing all the state required labs will not be able to take the regents exam and will need to repeat the course. The State Regents exam in each course is administered in June.

EARTH and SPACE SCIENCES R

One Credit

One Year

(1 period class daily with an additional lab period every other day)

An integrative study of geology, meteorology, and related sciences. As part of the 1200 lab minute requirement, students must also successfully complete the three state mandated labs. **REGENTS EXAMINATION**

LIFE SCIENCE (BIOLOGY) H

One Credit

One Year

(1 period class daily with an additional lab period every other day)

Prerequisite: Regents Earth Science 8H or Department Approval

An in-depth study of biological concepts. This course differs significantly from the Regents (R) level course in Biology. The range and depth of topics covered, and the amount of time students are expected to devote to homework and preparation for class and lab are significant. As part of the 1200 lab minute requirement, students must also successfully complete the three state mandated labs. **REGENTS EXAMINATION.**

LIFE SCIENCE (BIOLOGY) R

One Credit

One Year

(1 period class daily with an additional lab period every other day)

A study of biological concepts (ecology, evolution, genetics, etc.) employing a biochemical approach. As part of the 1200 lab minute requirement, students must also successfully complete the three state mandated labs. **REGENTS EXAMINATION.**

ENL LIFE SCIENCE (BIOLOGY)

Two Credits (one non-regents, one regents)

Two Years

This course is designed to be a two-year Living Environment course for students with limited ability in English.

COURSE A – First Year

Non-regents credit

One Year

(1 period class daily with an additional lab period every other day)

Students will complete a course of study of biological concepts (ecology, evolution, genetics, etc.) employing an environmental approach. Lab investigations meet State requirements. (600 minutes of laboratory experience and satisfactory lab reports documenting those activities are required) **SCHOOL EXAMINATION.**

COURSE B – Second Year

Regents credit

One Year

(1 period class daily with an additional lab period every other day)

Students will complete a course of study of biological concepts (ecology, evolution, genetics, etc.) employing an environmental approach. Lab investigations include State required labs and the 1200-minute

State lab requirement. As part of the 1200 lab minute requirement, students must also successfully complete the three state mandated labs. **REGENTS EXAMINATION.**

AE LIFE SCIENCE (BIOLOGY)

Two Credits (one non-regents, one regents)

Two Years

This course is designed to be a two-year Life Science (Biology) course for students with disabilities pending CSE recommendation.

COURSE A – First Year

Non-regents credit

One Year

(1 period class daily)

Students will complete a course of study of biological concepts (ecology, evolution, genetics, etc.) employing an environmental approach. Lab investigations meet State requirements. (600 minutes of laboratory experience and satisfactory lab reports documenting those activities are required) **SCHOOL EXAMINATION.**

COURSE B – Second Year

Regents credit

One Year

(1 period class daily)

Students will complete a course of study of biological concepts (ecology, evolution, genetics, etc.) employing an environmental approach. Lab investigations include State required labs and the 1200-minute State lab requirement. As part of the 1200 lab minute requirement, students must also successfully complete the three state mandated labs. **REGENTS EXAMINATION.**

CHEMISTRY H

One Credit

One Year

(1 period class daily with an additional lab period every other day)

Prerequisites: Biology H or Department Approval and Regents Algebra

An in-depth study of chemical concepts and principles requiring a strong capability in mathematics. **REGENTS EXAMINATION.**

CHEMISTRY R

One Credit

One Year

(1 period class daily with an additional lab period every other day)

Prerequisites: Regents Earth Science, Regents Biology or Department Approval and Regents Algebra

A study of chemical reactions, principles, and concepts involving considerable mathematical analysis. **REGENTS EXAMINATION.**

PHYSICS R

One Credit

One Year

(1 period class daily with an additional lab period every other day)

Prerequisites: Regents Earth Science, Regents Biology, Regents Chemistry or Department Approval and Regents Algebra and Geometry (or Co-Req)

This course is an in-depth study of physical principles and concepts. It is concerned with the fundamental structure, properties, and behavior of matter. **REGENTS EXAMINATION.**

ADVANCED PLACEMENT PHYSICS 1 AND PHYSICS HONORS COMBINED COURSE

Two Credits

One Year

(Double Period Class Daily)

Prerequisites: Regents Earth Science 8H, Biology H, Chemistry H or Department Approval and Regents Algebra and Geometry (or Co-Req)

This intensive course of study combines the physics honors course with the first year AP Physics 1 course. The course is designed to allow capable students with excellent prior performance in math and science to complete both a high school and a college-level physics course in one year. AP Physics 1 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics

through inquiry-based investigations as they explore these topics: kinematics; dynamics; circular motion and gravitation; energy; momentum; simple harmonic motion; torque and rotational motion; electric charge and electric force; DC circuits; and mechanical waves and sound. Preparation for class is expected to be at least one hour per night. **THE ADVANCED PLACEMENT EXAMINATION (IN MAY) IS REQUIRED. REGENTS EXAMINATION IN JUNE**

A.P. SCIENCE COURSES:

- BIOLOGY (1 period class daily with an additional lab period every other day)
- CHEMISTRY (1 period class daily with an additional lab period every other day)
- ENVIRONMENTAL SCIENCE (1 period class daily with an additional lab period every other day)
- AP PHYSICS 1 (algebra based) (Double Period Daily) (*See Description Above*)
- APC PHYSICS (calculus based) (1 period class daily with an additional lab period every other day)
- AP PHYSICS 2 (algebra based) (1 period class daily with an additional lab period every other day)
- COMPUTER SCIENCE PRINCIPLES (1 Period Daily)

One Credit each

One Year

Prerequisites: Students have taken a first-year course in Biology, Chemistry, and Physics* with satisfactory performance on those Regents exams

* For Physics 2 and APC Physics students must have taken AP Physics 1 and AP Physics 1 is 2 credits

The Advanced Placement Science courses are designed to be the equivalent of a college introductory course, which is usually taken during the college freshman year. The courses will include those topics regularly covered in a college course. These courses differ significantly from the high school courses in science with respect to the textbook used, the range and depth of topics covered, and the kind of laboratory work done by students. **SCHOOL EXAMINATION AND THE ADVANCED PLACEMENT EXAMINATION (in May) ARE REQUIRED.** Preparation for class is expected to take at least one hour per night.

AP BIOLOGY

(1 period class daily with an additional lab period every other day)

Prerequisites: Regents Earth Science 8H, Biology H, Chemistry H or Department Approval

AP Biology is an introductory college-level biology course. Students cultivate their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes — energy and communication, genetics, information transfer, ecology, and interactions. **THE ADVANCED PLACEMENT EXAMINATION (in May) IS REQUIRED.**

AP CHEMISTRY

(1 period class daily with an additional lab period every other day)

Prerequisites: Regents Earth Science 8H, Biology H, Chemistry H or Department Approval

The AP Chemistry course provides students with a college-level foundation to support future advanced course work in chemistry. Students cultivate their understanding of chemistry through inquiry-based investigations, as they explore topics such as: atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium. **THE ADVANCED PLACEMENT EXAMINATION (in May) IS REQUIRED.**

AP ENVIRONMENTAL SCIENCE

(1 period class daily with an additional lab period every other day)

Prerequisites: Regents Earth Science, Biology R, Chemistry R or Department Approval

AP Environmental Science is an introductory college-level course, through which students understand the relationships of the natural world. Students will identify and analyze natural and human-made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them. Environmental Science encompasses topics from geology, biology, environmental studies, environmental science, chemistry, and geography. **THE ADVANCED PLACEMENT EXAMINATION (in May) IS REQUIRED.**

AP PHYSICS 2: ALGEBRA-BASED

(1 period class daily with an additional lab period every other day)

Prerequisites: AP Physics 1, Regents Algebra and Geometry

AP Physics 2 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through inquiry-based investigations as they explore these topics: fluids; thermodynamics; electrical force, field, and potential; electric circuits; magnetism and electromagnetic induction; geometric and physical optics; and quantum, atomic, and nuclear physics. **THE ADVANCED PLACEMENT EXAMINATION (in May) IS REQUIRED.**

AP PHYSICS C: CALCULUS-BASED

(1 period class daily with an additional lab period every other day)

Prerequisites: AP Physics 1, Regents Algebra and Geometry

AP Physics C is a calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; electromagnetism; kinematics; Newton's laws of motion; work, energy and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. Introductory differential and integral calculus are used throughout the course. **THE ADVANCED PLACEMENT EXAMINATION (in May) IS REQUIRED.**

AP COMPUTER SCIENCE PRINCIPLES

Grades 10, 11, 12

(1 Period Class Daily)

AP Computer Science Principles is an introductory college-level course. Students will address real-world issues while studying the fundamentals of computing, including problem solving, working with data, understanding the Internet, cybersecurity, and programming. **THE ADVANCED PLACEMENT EXAMINATION (in May) IS REQUIRED.**

NON-REGENTS SCIENCE CLASSES

Each of the following courses is designed for students who may have had some difficulty with previous Science courses. Each is designed as a non-Regents laboratory course. A school final examination is given in June.

INTEGRATED SCIENCE

One Credit

One Year

(1 Period Class Daily)

Prerequisite: Juniors and Seniors.

A science survey course which integrates Earth Science, Chemistry and Physics in real world applications. The course includes laboratory investigations and projects. **SCHOOL EXAMINATION.**

FORENSIC SCIENCE

One-half Credit

One-half Year

(1 Period Class Daily)

Prerequisites: Seniors only. Passing one Regents Exam and fulfilled 2 years of science credits

Forensic science deals with the scientific techniques and principles needed to identify or compare physical evidence and how this evidence can be applied to the criminal justice system. Students will participate in lecture and laboratory investigations.

MARINE BIOLOGY (1 Period Class Daily)

One-half Credit

One-half Year

Prerequisites: Seniors only. Passing one Regents Exam and fulfilled 2 years of science credits

Marine biology explores the broad diversity of marine organisms and habitats, including an introduction to ocean science, effects of the physical environment on marine organisms, introduction to ocean science, effects of the physical environment on marine organisms, introduction to the diversity of marine organisms, biodiversity, pollution, fisheries, and habitats. Students will participate in lecture, lab investigations and field experiences. Students are responsible for expenses associated with field experiences.

DUAL ENROLLMENT COURSES

COLLEGE MARINE BIOLOGY (MOLLOY UNIVERSITY) (1 Period Class Daily)

One-half Credit

One-half Year

Prerequisites: Seniors only. Earth Science, Biology and Chemistry (Regents or Honors)

This course, under the aegis of Molloy College, explores the board diversity of marine organisms and habitats. The curriculum includes an introduction to the history of marine science, marine environments, diversity of marine organisms, and marine ecology interdependence in the sea including human impact. Students will participate in lecture, lab investigations and field experiences. Students are responsible for expenses associated with field experiences. **There is a fee made payable directly to Molloy College. Upon successful completion, students can earn 3 college credits for this course.**

COLLEGE FORENSICS (MOLLOY UNIVERSITY) (1 Period Class Daily)

One-half Credit

One-half Year

Prerequisites: Seniors only. Earth Science, Biology and Chemistry (Regents or Honors)

This course, under the aegis of Molloy College, introduces the techniques of scientific criminal investigation and the forensic photographing, collection, processing, and documentation of crime scene data, such as: fingerprints, hair, blood and toxicology, footwear outsole patterns, tire tracks, gunshot residues, and textile fibers. Case illustrations will be drawn from leading criminal cases. Students will participate in lecture, lab, and field experiences. Students will be responsible for expenses associated with field experiences. **There is a fee made payable directly to Molloy College. Upon successful completion, students can earn 3 college credits for this course.**

MEDICAL & HEALTH SCIENCES ACADEMY

ALLIED HEALTH

One-half Credit

One-half Year

In this course students will be introduced to a wide variety of health care careers, and the education and skills required for each of those careers. Students will study the history of medicine and the development and structure of health care systems of today. Legal and ethical issues surrounding medical decisions, and the importance of confidentiality between doctor and patient will be examined. An introduction to the language of medicine, or medical terminology will also be covered. Students will be introduced to Medical Records and Health Information Technology. They will look over medical documents to see how the terms are used and appear. They will develop an understanding of how computer codes are used to designate different parts of the body. Interpersonal skills will be honed through various hands-on activities. The use of computer technology in health care will be explored. Students will use computers to input data as well as utilize programs for medical terminology, medical coding and career searches.

EMERGENCY MEDICINE

One-half Credit

One-half Year

Prerequisite: Allied Health (or Co-Req)

Students learn the role and function of an emergency medical technician. The skills and techniques of CPR, AED, transport and first aid for patients is provided and students have the opportunities to practice their skills on mannequins and in the Medical Simulation Room. These skills include but are not limited to, opening and maintaining an airway, ventilating patients, administering cardiopulmonary resuscitation, including use of automated external defibrillators, providing pre-hospital emergency medical care of simple and multiple system trauma such as hemorrhage control, treatment of shock, bandaging wounds, and immobilization of painful, swollen, or deformed extremities, neck or spine. Opportunities exist to visit a hospital EMT facility, and an ambulance visits the school to explain the role of the EMT.

MEDICAL TECHNOLOGY

One-half Credit

One-half Year

Prerequisites: Allied Health and EMT

Careers in medical laboratories and the skills and techniques necessary for these careers are the focus of the course. Students will practice these skills in the Medical Simulation Room on a regular basis. Skills include, but are not limited to, blood analysis, urine analysis, phlebotomy, preparation and analysis of bacterial smears, and basic medical laboratory techniques. Opportunities to conduct laboratory work at the Cold Spring Harbor DNA Lab are available and visits to medical laboratories at local hospitals will be conducted throughout the course.

RADIOLOGY

One-half Credit

One-half Year

Prerequisites: Allied Health and EMT

Students are provided with an introductory foundation into basic medical physics and the operation of diagnostic and therapeutic procedures involving radiation. Careers in radiology and radiological technology are discussed including diagnostic radiologist, radiation oncologist, radiographer, nuclear medicine technologist, radiation therapist, cardiovascular-interventional technologist, computed tomography technologist, magnetic resonance technologist, mammographer, sonographer, bone density technologist and quality management technologist. Students examine the techniques for performing and evaluating X-rays, CT scans, MRIs, PETT scans, mammograms, sonograms and cardiovascular-intervention therapies. Opportunities are available to visit a hospital radiation oncology facility.

COLLEGE ANATOMY AND PHYSIOLOGY WITH LAB (Long Island University)

One Credit

One Year

(1 period class daily with an additional lab period every other day)

Prerequisites: Allied Health, EMT, Med Tech, and Radiology

This is a college level, in depth study of human anatomy and physiology. Topics include but are not limited to the organs and functions of the respiratory, cardiovascular, endocrine, skeletal, muscular, nervous, sensory, digestive, urinary, excretory, integumentary, lymphatic, immune and reproductive systems. Lab work is a required part of the course. **There is a fee made payable directly to LIU. Upon successful completion, students can earn 8 college credits for this course.**

AP RESEARCH

One Credit

One Year

Grades 11-12

Prerequisite: AP Seminar

AP Research is the second required course in the AP Capstone program. Students engage in a yearlong investigation to address a research question. Students explore a topic or question of personal interest and develop a comprehensive argument and solution. AP Research will expand students' knowledge of research methodology as students employ ethical research practices; analyze, synthesize, and evaluate information; and build empathy for their topic of interest by establishing partnerships with experts in the field. The course culminates in an academic paper of 4,000-5,000 words (accompanied by a performance, exhibit or product where applicable) and a presentation with an oral defense. Open to students in grades 11 and 12.

STEAM ACADEMY

DESIGN & DISCOVERY

One-half Credit

One-half Year

This course is an introduction to engineering and the various types of engineering career paths. There is a focus on the skills and techniques associated with mechanical engineering and the fundamentals of electricity. Students will engage in project work in conjunction with the Engineering by Design program.

INTRODUCTION TO SCIENTIFIC RESEARCH & INQUIRY

Grade 9

One-half Credit

One-half Year

(1 Period every other day)

This introductory course provides students with the foundation for conducting authentic scientific research. Through hands-on investigations, students learn how scientists ask questions, design experiments, collect and analyze data, and communicate their findings. Students will explore real-world science related topics in their community while developing essential skills in critical thinking, scientific writing, and data literacy. There is a mini research project, where students apply their learning to an independent investigation of their choice. The class will meet on alternating days for the entire school year. This course serves as the first step in the four-year Science Research sequence, preparing students for advanced coursework, mentorship, and college-level research in later years.