

SCIENCE

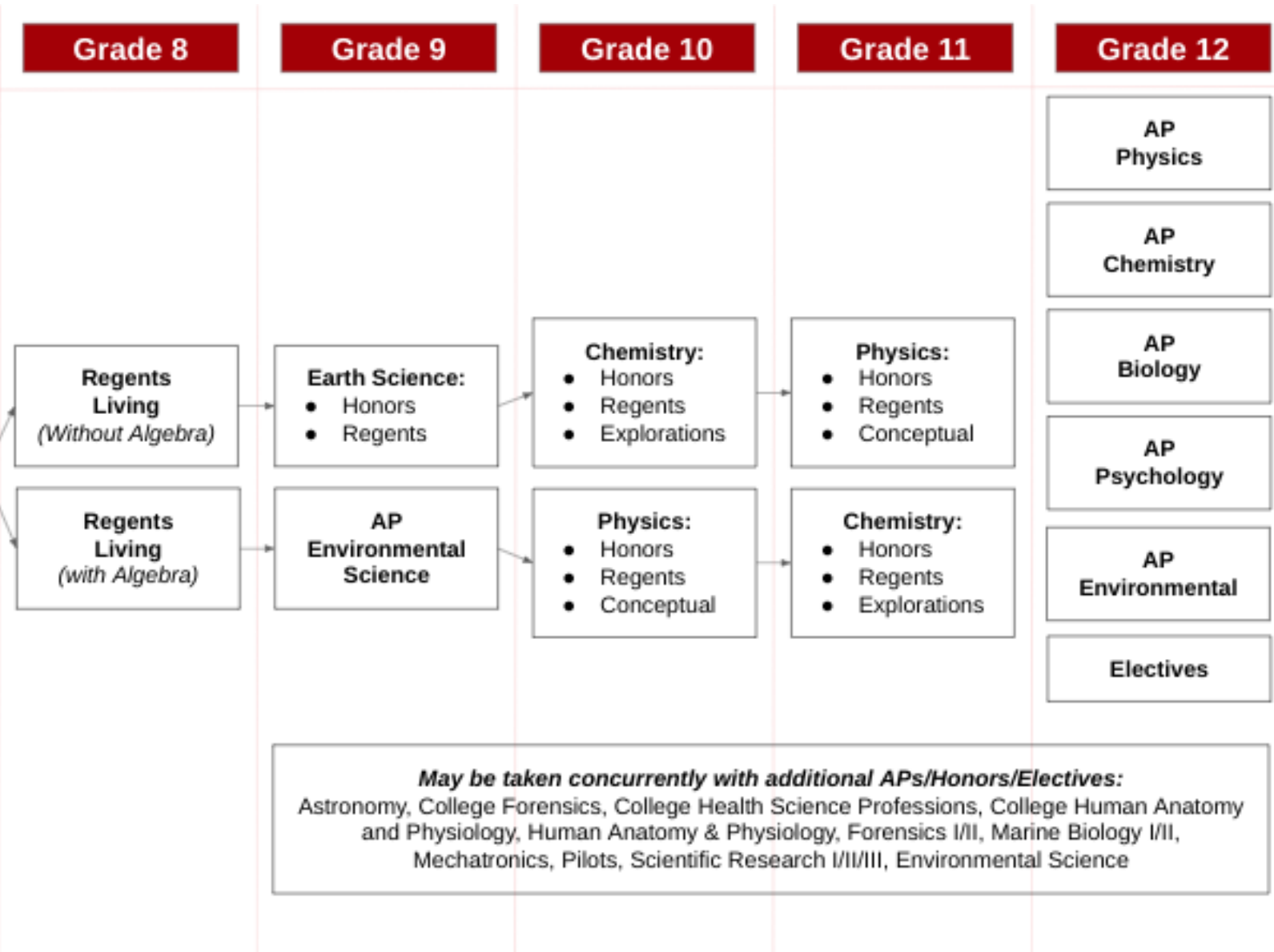
The New York State Education Department requirements necessary for a high school diploma include passing a Regents exam in science (65 or greater) along with three science credits. For a student to achieve an Advanced Regents Diploma, the necessary requirements include passing two Regents exams in science with a 65 or greater (the Living Environment/Biology Regents plus one Regents Physical Setting course), and passing three science courses. It is the purpose of the Science Department at Glen Cove High School to provide an environment where students can explore scientific concepts, approach problems from many perspectives, and become literate in scientific issues.

HONORS AND ADVANCED PLACEMENT SUGGESTED CRITERIA:

For a student to advance from a Regents to an Honors-level course, or from an Honors to an AP level, we recommend the student earns an overall average of 90 in the prerequisite course. For a student to maintain placement in an Honors or AP level, we recommend the student earns an overall average of 85 in that course.

COMMON SCIENCE PATHWAYS:

The pathways outlined below are highly suggested, however, we always attempt to meet the needs of individual students.



LIVING ENVIRONMENT: Suggested Completion, Grade 8

415 LIVING ENVIRONMENT/BIOLOGY – 1 Credit. This is a one-year course that provides students with a basic understanding of biological processes and generalizations. Topics include unity and diversity in living things, maintenance in living things, human physiology, reproduction and development, genetics, evolution, and ecology. Course meetings alternate by day between single and double periods. Laboratory requirement: Successful completion of a minimum of 1,200 laboratory minutes and a written report of each laboratory exercise. Assessment: Various assessments will be used, including, but not limited to, laboratory reports, projects, tests, class participation, homework, and the Regents examination.

EARTH SCIENCE/AP ENVIRONMENTAL: Suggested Completion, Grade 9

401 EARTH SCIENCE/EARTH AND SPACE SCIENCES – 1 Credit. Suggested Criteria: Successful completion of Living Environment, as well as passing the Regents exam for that course. This is a one-year course on the physical materials making up Earth and the surrounding environment. Nine core topics and at least two additional optional topics are covered from the New York State Regents Earth Science Syllabus. Class meetings alternate by day between single and double periods. Laboratory requirement: Completion of a minimum of 1,200 laboratory minutes and a written report of each laboratory exercise. In addition, considerable emphasis is placed on data analysis and problem-solving. Assessment: Various assessments will be used, such as laboratory reports, projects, tests, class participation, homework and the Regents examination.

407 EARTH SCIENCE/EARTH AND SPACE SCIENCES HONORS – 1 Credit. Suggested Criteria: Successful completion of Living Environment, as well as passing the Regents exam for that course. This is a rigorous one-year course on the physical materials making up Earth and the surrounding environment. Nine core topics and at least two additional optional topics are covered from the New York State Regents Earth Science Syllabus. Class meetings alternate by day between single and double periods. Laboratory requirement: Completion of a minimum of 1,200 laboratory minutes and a written report of each laboratory exercise. In addition, considerable emphasis is placed on data analysis and problem-solving. Assessment: Various assessments will be used, such as laboratory reports, projects, tests, class participation, homework and the Regents examination.

452 ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE – 1 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. The goal of the course is to provide students with the scientific principles, concepts and methodologies needed to understand the interrelationships between people and their environment, as well as to identify and analyze environmental problems, both natural and human-made, to assess the risks associated with these problems and to identify solutions for resolving or preventing them. Class meetings alternate by day between single and double periods. The course is comparable to a one-semester introductory college course and has a significant laboratory/fieldwork component. Extensive outside reading and independent study are expected. Assessment: Various assessments will be used, such as tests, laboratory reports, projects, class participation, homework, and a final examination/project. The student must take the Advanced Placement examination in Environmental Science.

CHEMISTRY: Suggested Completion, Grade 10/11

418 CHEMICAL EXPLORATIONS – 1 Credit. **Should not be taken if Regents credit in Chemistry is the main objective.* **Suggested Criteria: Successful completion of two years of Regents science and Algebra I, as well as passing the Regents exam for each course.** This is a one-year course that gives an introduction to fundamental chemical concepts and problems, with an emphasis placed on the application of chemical principles to real-life situations. Demonstrations and laboratory experiments will be performed to illustrate the variety of chemistry applications that can be used for problems in the home, environment, marketplace, industry, medicine, nutrition, and basic daily life. This course connects the general chemistry curriculum to hands-on project-based learning that makes evident connections to students' daily lives. The course involves some chemical mathematics, and students should have basic algebra skills.

420 PHYSICAL SCIENCES: CHEMISTRY – 1 Credit. **Suggested Criteria: Successful completion of two years of Regents science and Algebra I, as well as passing the Regents exam for each course.** An examination of the basic laws of chemistry is presented in the classroom and reinforced in the laboratory. Much material is presented quantitatively. Class meetings alternate by day between single and double periods. Laboratory requirement: Successful completion of a minimum of 1,200 laboratory minutes and a written report of each laboratory exercise. Assessment: Various assessments will be used, such as laboratory reports, projects, tests, class participation, homework and the Regents examination.

419 PHYSICAL SCIENCES: CHEMISTRY HONORS – 1 Credit. **Suggested Criteria: Successful completion of two years of Regents science and Algebra I, as well as passing the Regents exam for each course.** A one-year course providing an in-depth analysis of the topics covered in the NYS Regents Chemistry Syllabus. Topics from the SAT Subject Test Syllabus will also be covered. This course is recommended for students who appreciate the analytical relationship between science and mathematics. Class meetings alternate by day between single and double periods. Laboratory requirement: Successful completion of a minimum of 1,200 laboratory minutes and a written report of each laboratory exercise completed. Assessment: Various assessments will be used, such as laboratory reports, projects, tests, class participation, homework and the Regents examination.

PHYSICS: Suggested Completion, Grade 10/11

429 CONCEPTUAL PHYSICS – 1 Credit. **Should not be taken if Regents credit in Physics is the main objective.* **Suggested Prerequisites:** Successful completion of Living Environment and/or Earth Science, as well as Algebra 1. This is a one-year course that largely uses a conceptual approach to understanding the principles of physics. Students are more likely to experience success if they are taking any math class concurrently. Some mathematical models are developed and require students to employ algebra and geometry. Topics include motion, forces, momentum, energy, waves, sound, light, electricity, and magnetism. Physics principles are related to relevant aspects of students' experiences. Laboratory activities and small projects are commonly included in this course. This course will conclude with a comprehensive departmental final exam.

498 PHYSICAL SCIENCES: PHYSICS – 1 Credit. **Suggested Criteria: Successful completion of Chemistry and Geometry, as well as passing the Regents exam for each course.** This is a one-year course on the basic laws of physics. Vectors, forces, motion, wave phenomena, electricity, magnetism, nuclear and atomic physics and other major topics in physics are covered. Class meetings alternate by day between single and double periods. Laboratory requirement: Successful completion of a minimum of 1,200 laboratory minutes and a written report of each laboratory exercise completed. Assessment: Various assessments will be used, such as laboratory reports, projects, tests, class participation, homework and the Regents examination.

430 PHYSICAL SETTING: HONORS PHYSICS – 1 Credit. Prerequisites: Successful completion of Geometry, as well as passing the Regents exam. This is a one-year course on the basic laws of physics. Vectors, forces, motion, wave phenomena, electricity, magnetism, nuclear and atomic physics and other major topics in physics are covered. Class meetings alternate by day between single and double periods. Laboratory requirement: Successful completion of a minimum of 1,200 laboratory minutes and a written report of each laboratory exercise completed. Assessment: Various assessments will be used, such as laboratory reports, projects, tests, class participation, homework and Regents examination.

432 ADVANCED PLACEMENT PHYSICS – 1 Credit. Suggested Criteria: Successful completion of Physics and Algebra II, as well as passing the Regents exam for each course. This course provides a systematic and intensive introduction to the main principles of non-calculus-based college physics. The course emphasizes the development of problem-solving at the college level and provides a foundation in physics for students pursuing life science, pre-medicine, and applied science careers. Course content includes kinematics, dynamics, rotational statics/dynamics, work/energy, oscillations, mechanical waves, conservation laws, electrostatics, and circuit laws for resistance arranged in serial/parallel configurations. Class meetings are double periods every other day. Laboratory requirement: Students are expected to devote a significant amount of time to laboratory exercises. Laboratory experiments will be performed at a college level and may include computer simulations. Assessment: Various assessments will be used, such as tests, laboratory reports, projects, class participation, homework, and a final examination/project. The student must take the AP examination in Physics.

ELECTIVE SCIENCE COURSES

**Elective Science Courses should be taken concurrently with, not in substitution to, core science courses outlined in the pathways above.*

451 FORENSIC SCIENCE I – .5 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. Can be taken concurrently with a laboratory science course. The course introduces skills of forensic science. Investigations in fiber analysis, fingerprinting and blood sample analysis will assist students in problem-solving. This course is strongly recommended for students who are considering a career in a health-related field or police science. Simulated crime scene investigations will take place. Assessment: Various assessments will be used, such as class participation, homework, tests, projects and a final examination/project.

457 FORENSIC SCIENCE II – .5 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. Can be taken concurrently with a laboratory science course. The Forensic Science II class will expand on materials and skills explored in the elective, along with the exploration of several new topics. Where the first course focused on the forensic analysis of evidence collected from the crime scene, the second course will encourage students to begin drawing conclusions about their findings and more deeply explore investigative techniques. Examples of new topics that will be covered include forensic psychology, profiling and forensic anthropology.

449 ASTRONOMY – .5 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. Can be taken concurrently with a laboratory science course. This is an in-depth study of the solar system, including the sun, planets and the moons thereof, asteroids, comets, and local space exploration, as well as other celestial phenomena, our galaxy, and the universe. Astronomical theories, historical perspectives, galactic movement, and stellar positions, as well as other astronomical data, will be considered. Some post-school day field experiences are possible.

470 MARINE BIOLOGY I – .5 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. Can be taken concurrently with a laboratory science course. This course deals with various scientific disciplines used to study the ocean. This course is designed for the student seeking to gain a basic understanding of the physical, chemical and biological processes of the marine environment.

471 MARINE BIOLOGY II – .5 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. Can be taken concurrently with a laboratory science course. This course will study the way in which marine ecosystems and the organisms that live in them have changed and are changing in recent times. It will focus on the impact of humans on the marine environment and the importance of the marine environment on human existence. Finally, this course will provide a perspective that encourages marine eco-friendly practices and the ways in which the marine environment can be researched and studied.

455 ENVIRONMENTAL SCIENCE – 1 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. Emphasis will be placed on the biotic environment required by a variety of living things and their direct effect on other living things, including the human condition and environmental conditions that exist. Economic, social, political, ethical and legal aspects of environmental concerns will be explored, with an emphasis on local concerns. Laboratory requirements: Teacher demonstrations, field trips, laboratory activities and reports will vary according to the topic being studied. Assessment: Various assessments will be used, such as tests, reports, projects, class participation, homework and a final examination/project.

445 PILOT GROUND SCHOOL – 1 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. This course is open to students from grades 10, 11 and 12. This course includes the biology of the human in space. Earth Science topics include latitude and longitude, time and landscapes plus chemical fuels and the physics of flying. Students will be shown employment opportunities in aviation-related fields; pilots, air controllers, and mechanics are just a few of these. **Upon successful completion of this course, students will receive a certificate enabling them to take the written pilot's licensing exam.**

462 HUMAN ANATOMY AND PHYSIOLOGY II – 1 Credit. Suggested Criteria: Successful completion of Living Environment and passing the Regents exam for that course, and/or Human Anatomy and Physiology I Honors. Can be taken concurrently with a laboratory science course. This elective will include a year-long, in-depth study of advanced topics in human anatomy and physiology. The body systems examined will include those not covered in the Human Anatomy and Physiology I Honors course. Topics of study will include systems of the human body (nervous and special senses/ neuroscience, endocrine, circulatory/hematology, lymphatic/immunology, reproductive with embryology and development); diseases affecting these systems; career exploration; relevant topics (i.e., Ebola and measles outbreaks, regenerative medicine, personalized medicine) and an interdisciplinary unit on medicine and society. This course has no double periods; however, students will have many hands-on experiences with gross anatomical specimens and tissue samples. Hands-on explorations that simulate the various physiological processes in the body will also be conducted. Readings and group discussion of relevant scientific articles will be conducted. Possible field trips to local hospitals may be planned. Guest speakers from the health professions will be invited to address the students.

AP SCIENCE COURSES

422 ADVANCED PLACEMENT CHEMISTRY – 1 Credit. Suggested Criteria: Successful completion of Chemistry and Algebra I, as well as passing the Regents exam for each course. This is a one-year course in chemistry, taught on a college level, which deals with the structure of matter, kinetic theory of gasses, chemical kinetics, thermodynamics, oxidation-reduction, descriptive chemistry, and the basic concepts of organic chemistry. Heavy emphasis is placed on laboratory work. The course includes preparation for the Advanced Placement Chemistry examination. Class meetings alternate by day between single and double periods. Laboratory requirement: Students are expected to devote a significant amount of time to laboratory exercises. Laboratory experiments will be qualitative and quantitative and stress the analytical relationship between science and mathematics. Assessment: Various assessments will be used, such as tests, projects, class participation, homework, laboratory reports, analysis of laboratory unknowns, and a final examination/project. The student must take the Advanced Placement examination in Chemistry.

450 ADVANCED PLACEMENT BIOLOGY – 1 Credit. Suggested Criteria: Successful completion of Chemistry and Algebra I, as well as passing the Regents exam for each course. This is a one-year course in biology for science majors, taught on a college level, which deals with life on the molecular and cellular levels. Included is an emphasis on laboratory work. Extensive outside reading and independent study is expected. The course includes preparation for the Advanced Placement examination in Biology. Class meetings alternate by day between single and double periods. Laboratory requirement: Students are expected to devote a significant amount of time to laboratory exercises. Assessment: Various assessments will be used, such as laboratory work (as evidenced by written reports, initiative and skills demonstrated to the instructor), tests, projects, class participation, homework and a final examination/project. The student must take the Advanced Placement examination in Biology.

446 ADVANCED PLACEMENT PSYCHOLOGY – 1 Credit in Science. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. This course is an introductory college-level course in psychology. The following areas of study are discussed: methods, approaches, history of psychology, biological bases of behavior, sensation, and perception, states of consciousness, learning, cognition, motivation and emotion, developmental psychology, personality, testing, individual differences, abnormal psychology, and psychological disorders. The student must take the Advanced Placement examination in Psychology.

432 ADVANCED PLACEMENT PHYSICS – 1 Credit. Suggested Criteria: Successful completion of Physics and Algebra II, as well as passing the Regents exam for each course. This course provides a systematic and intensive introduction to the main principles of non-calculus-based college physics. The course emphasizes the development of problem-solving at the college level and provides a foundation in physics for students pursuing life science, pre-medicine, and applied science careers. Course content includes kinematics, dynamics, rotational statics/dynamics, work/energy, oscillations, mechanical waves, conservation laws, electrostatics, and circuit laws for resistance arranged in serial/parallel configurations. Class meetings are double periods daily. Laboratory requirement: Students are expected to devote a significant amount of time to laboratory exercises. Laboratory experiments will be performed at a college level and may include computer simulations. The student must take the AP examination in Physics.

452 ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE – 1 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. The goal of the course is to provide students with the scientific principles, concepts and methodologies needed to understand the interrelationships between people and their environment, as well as to identify and analyze environmental problems, both natural and human-made, to assess the risks associated with these problems and to identify solutions for resolving or preventing them. Class meetings alternate by day between single and double periods. The course is comparable to a one-semester introductory college course and has a significant laboratory/fieldwork component. Extensive outside reading and independent study are expected. The student must take the Advanced Placement examination in Environmental Science.

HONORS SCIENCE ELECTIVES

**Elective Science Courses should be taken concurrently with, not in substitution to, core science courses outlined in the pathways above.*

453 HUMAN ANATOMY AND PHYSIOLOGY I HONORS – 1 Credit. Suggested Criteria: Successful completion of Living Environment and passing the Regents exam for that course. Can be taken concurrently with a laboratory science course. This rigorous elective will include a year-long, in-depth study of human anatomy and physiology. The areas covered will include medical terminology, basic chemistry, cell and tissue structure, and systems of the human body (integumentary, skeletal, muscular, circulatory, respiratory, digestive, and urinary). Study of human diseases will also be included. This course has no double periods; however, students will have many hands-on experiences with gross anatomical specimens and tissue samples. Hands-on explorations that simulate the various physiological processes in the body will also be conducted. Possible field trips to local hospitals, laboratories or the Body Worlds exhibit in New York City may be planned. Guest speakers from the health professions will be invited to address the students.

404 INTRODUCTION TO MECHATRONICS HONORS – 1 Credit. Suggested for students who have a strong interest in engineering, computer science, or robotics. This honors-weighted elective will provide students with the opportunity to learn about various engineering disciplines, including mechanical, electrical, and computer engineering. Students will then be able to apply theory, principles, and engineering design to solve hands-on problems involving different robotics components, including Lego Mindstorms and the Haddington Dynamics Dexter robot. As part of the course, students will have access to participate in local hackathons where they can showcase their accomplishments in coding and robotics.

440 SCIENCE RESEARCH LITERACY HONORS – .5 Credit. Prerequisite: 9th and 10th grade students only. This course will introduce students to methodologies of research to provide students with skills needed to ultimately conduct an independent research investigation. This course is intended to prepare students for science research undertaken through high school and research internships outside of high school. Students will read and analyze research journals. They will also learn the basic skills of scientific investigation and scientific writing by doing their own research project. The course culminates in writing a term paper in the form of a scientific article. Students' research reports will be submitted to various science competitions i.e., Long Island Science and Engineering Fair, Long Island Science Congress, Northwell Medical Marvels, or Toshiba Exploravision.

441 SECOND-YEAR SCIENTIFIC RESEARCH HONORS – .5 Credit. Prerequisite: Successful completion of Science Research Literacy. This course will continue the work from the Science Research Literacy course in terms of methodologies of research. During the first semester, students will create research reports that can be submitted to science competitions, i.e., Long Island Science and Engineering Fair, Long Island Science Congress, Northwell Medical Marvels or Toshiba Exploravision. In their second semester, students will find scientists at local university laboratories working in areas of interest to them to serve as project mentors.

443 THIRD-YEAR SCIENTIFIC RESEARCH HONORS – .5 Credit. Prerequisite: Successful completion of Second-Year Scientific Research Honors. This course will continue the work from the Second-Year Scientific Research Honors course in terms of competitions and methodologies of research. During the first semester, students will connect with outside mentors to work in areas of interest to them and to serve as project mentors. In their second semester, students work on the research projects and make a plan to continue this work during the summer. In class, students will work closely with the teacher to fine-tune a research proposal and begin the work of compiling results into a preliminary research paper.

443 FOURTH-YEAR SCIENTIFIC RESEARCH HONORS – .5 Credit. Prerequisite: Successful completion of Third-Year Scientific Research Honors. This course will continue the work from the Third-Year Scientific Research Honors course in terms of competitions and methodologies of research. Students complete work on their individual independent research projects. The final product of the research work is the original scientific research paper. During the fall semester, students will submit their papers to science competitions e.g.: Siemens-Westinghouse, Intel, New York Academy of Sciences (NYAS), Junior Science and Humanities Symposium (JSHS). During the spring semester, students will present a research seminar, and provide assistance to sophomore and junior research students.

HONORS / COLLEGE DUAL ENROLLMENT SCIENCE COURSES

**Elective Science Courses should be taken concurrently with, not in substitution to, core science courses outlined in the pathways above.*

442 COLLEGE FORENSICS – .5 Credit. Suggested Criteria: Successful completion of one year of Regents science, as well as passing the Regents exam for that course. Can be taken concurrently with a laboratory science course. 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 techniques used in evaluating physical evidence. Topics include blood analysis, organic and chemical toxicology, fiber comparisons, paints, glass compositions and fragmentation, fingerprints, soil comparisons and arson investigation, among others. This honors-weighted dual enrollment course is linked to the Long Island University High School Scholars Program. Students have the opportunity to earn three college credits for the course. (Please see the Long Island University Program description under the Specialty Programs section for further details).

464 COLLEGE HUMAN ANATOMY AND PHYSIOLOGY - 1 Credit. Prerequisites: Living Environment and Regents Chemistry*, and passing the Regents exam for both courses. *Students may be co-seated in Regents Chemistry or Chemistry Honors in the same year as this course. This course covers the structure of the human body, including basic biochemistry, cell structure, cell division, cell respiration, tissue composition, genetics, nervous system, endocrine system, musculoskeletal system, cardiovascular system, lymphatic system, immune system, respiratory system, excretory system, digestive system, and reproductive system. Laboratory activities will explore relevant histology, dissection, and physiological experiments. This honors-weighted dual enrollment course is linked to the Long Island University High School Scholars Program. Students have the opportunity to earn up to eight college credits for the course. (Please see the Long Island University Program description under the Specialty Programs section for further details).

465 COLLEGE HEALTH SCIENCES AND PROFESSIONS - 1 Credit. Suggested Criteria: Successful completion of Living Environment and passing the Regents exam for that course. Can be taken concurrently with a laboratory science course. This course will cover human diseases and pathologies, medical innovations, current events and social issues in healthcare, an introduction to various professions in the healthcare field, an overview of healthcare systems, major aspects of healthcare delivery, national and local healthcare priorities, health careers, professional behavior, values, interests, ethics. In addition, students can begin to explore health career options based on an understanding of professional tasks, skills, tools, technologies, abilities, work activities, work context/environment and education, training and legal requirements, introductory medical terminology, and professional resume creation that may be used for future opportunities. This honors-weighted dual enrollment course is linked to the Long Island University High School Scholars Program. Students have the opportunity to earn up to six college credits for the course. (Please see the Long Island University Program description under the Specialty Programs section for further details).