Science

Every student must take a Biology course in either Grade 9 or Grade 10. This graduation requirement is based on the North Allegheny School District High School Graduation Requirements Board Policy #217 for compliance with State Board of Education Regulations and Keystone Exams legislation.

CREDIT	COURSE TITLE	COURSE #	OPEN TO GRADES
1.0	Biology (IMPACT)*	0901	9
1.0	Biology	0902	9
1.5	Academic Biology	0903	9
1.5	Honors Biology	0904	9
1.0	Introduction to Physics & Chemistry (IMPACT)*	0931	10
1.0	Introduction to Physics & Chemistry	0932	10
1.0	Academic Introduction to Physics & Chemistry	0933	10
1.5	Honors Chemistry	0914	10,11,12
1.0	Applied Science 1	0981	11,12
1.0	Applied Science 2	0982	11,12
1.0	Environmental Science	0952	11,12
1.0	Honors Environmental Science	0954	11,12
1.0	AP Environmental Science	0955	11,12
1.0	Astronomy	0962	11,12
1.0	Honors Astronomy	0964	11,12
1.5	Academic Chemistry	0913	11,12
1.0	Honors Organic Chemistry	0984	11,12
1.5	AP Chemistry (CHS)	0915	11,12
1.0	Honors Meteorology	0983	11,12
1.0	Academics Physics	0923	11,12
1.5	Honors Physics	0924	11,12
1.5	AP Physics 1 & 2 (CHS)	0927	11,12

*** These courses are connected to the IMPACT program and require a specific recommendation through the program coordinator or school counselor.**

(CHS) Indicates College in High School Course

Science

CREDIT	COURSE TITLE	COURSE #	OPEN TO GRADES
1.0	AP Physics 1	0925	11,12
1.0	AP Physics 2	0926	11,12
1.5	AP Physics C	0928	11,12
1.0	Academic Anatomy & Physiology	0943	11,12
1.0	Honors Anatomy & Physiology	0944	11,12
1.5	AP Biology (CHS)	0905	11,12

*** These courses are connected to the IMPACT program and require a specific recommendation through the program coordinator or school counselor.**

(CHS) Indicates College in High School Course

Science

Course Title:	Biology (IMPACT)	**Credit Value:**	1.0
Course Number:	0901	**STEM:**	Yes
Open to Grade(s):	9	**NCAA:**	No
Requirements:	• This course is reserved for students who qualify for and are accepted into the IMPACT Program.		
	This course presents the processes, structures, and functions of living organisms. Students will engage in basic experiments, investigations, and discussions to learn about cells, heredity, evolution, and ecology. This class meets five periods each week.		

Course Title:	Biology	**Credit Value:**	1.0
Course Number:	0902	**STEM:**	Yes
Open to Grade(s):	9	**NCAA:**	Yes
Requirements:	• None		
	This course provides a dual microscopic/macroscopic approach that covers life at all levels of biological organization. It takes an intriguing look into what different organisms have in common as well as how they interact with each other. Classroom discussions, investigations, demonstrations, and laboratory activities are included to enhance student learning while promoting collaboration and teaching critical thinking skills. Topics include cells, biochemistry, heredity, evolution, and ecology, with practical applications for each. This class meets five periods each week.		

Course Title:	Academic Biology	**Credit Value:**	1.5
Course Number:	0903	**STEM:**	Yes
Open to Grade(s):	9	**NCAA:**	Yes
Requirements:	• Minimum of 85% in 8th grade Science. • Minimum of 75% in Advanced Algebra 1 (or a higher-level Mathematics course) or minimum of 85% in Academic Algebra 1.		
	This course is a comprehensive approach to life science life science with an emphasis on structural and functional relationships at both the micro- and macroscopic levels of study. Students will frequently work cooperatively to perform hands-on inquiry based experiments and activities in areas such as biochemistry, heredity, evolution, ecology, and the cellular basis of life, with practical applications of each. This class meets seven/eight periods each week. Students should expect a workload commensurate with the level of the class, including some independent study, on grade-level reading, and mathematical computation.		

Course Title:	Honors Biology	**Credit Value:**	1.5
Course Number:	0904	**STEM:**	Yes
Open to Grade(s):	9	**NCAA:**	Yes
Requirements:	• Minimum of 93% in 8th grade Science. • Minimum of 85% in Advanced Algebra 1 (or a higher-level Mathematics course) or minimum of 95% in Academic Algebra 1.		
	This course is an in-depth approach to life science with an emphasis on structural and functional relationships at both the micro- and macroscopic levels of study. Students will frequently work cooperatively to perform hands-on inquiry based experiments and activities in areas such as biochemistry, heredity, evolution, ecology, and the cellular basis of life. The ability to apply knowledge to novel applications is expected. This class meets seven/eight periods each week. Students should expect a rigorous workload commensurate with the level of the class, including independent study, advanced reading, and mathematical computation.		

Course Title:	Introduction to Physics & Chemistry (IMPACT)	**Credit Value:**	1.0
Course Number:	0931	**STEM:**	Yes
Open to Grade(s):	10	**NCAA:**	Yes
Requirements:	• This course is reserved for students who qualify for and are accepted into the IMPACT Program.		
	Introduction to Physics and Chemistry is a study of the nature and behavior of all non-living things in the natural world. This course uses laboratory exercises, demonstrations, and other classroom experiences to help students learn about the physical world. Laboratory experiments and demonstrations will supplement classroom discussion. Instructional modifications are made to help students understand scientific concepts. Team building and motivation play a major part in all aspects of the IMPACT program.		

Course Title:	Introduction to Physics & Chemistry	**Credit Value:**	1.0
Course Number:	0932	**STEM:**	Yes
Open to Grade(s):	10	**NCAA:**	Yes
Requirements:	• None		
	Students in Introduction to Physics and Chemistry will use laboratory exercises, demonstrations, and other classroom experiences to learn about the non-living physical world. Students will have one semester of introductory physics and one semester of introductory chemistry. This is primarily a learning-by-doing course and students should be capable of learning by inquiry and working cooperatively in small group and large group laboratory situations. This class meets five periods per week.		

Course Title:	Academic Introduction to Physics & Chemistry	**Credit Value:**	1.0
Course Number:	0933	**STEM:**	Yes
Open to Grade(s):	10	**NCAA:**	Yes
Requirements:	● Minimum of 80% in Honors Geometry (or a higher-level Mathematics course) OR minimum of 85% in Academic Geometry. ● Minimum of 80% in Academic Biology OR minimum of 95% in Biology.		
	Academic Introduction to Physics and Chemistry is designed for the student who is capable of learning the laws of nature primarily through hands-on investigations and analyzing the results through complex mathematical and graphical comparisons. Students are expected to explain the analyses of their investigations through properly written conclusion statements following techniques used by true scientists. Students will have one semester of introductory physics and one semester of introductory chemistry. Students should be capable of learning by inquiry and working cooperatively in small group and large group laboratory situations. This class meets five periods per week.		

Course Title:	Honors Chemistry	**Credit Value:**	1.5
Course Number:	0914	**STEM:**	Yes
Open to Grade(s):	10-12	**NCAA:**	Yes
Requirements:	For students entering grade 10: ● Minimum of 80% in Honors Biology or minimum of 95% in Academic Biology. ● Minimum of 85% in Honors Geometry or a higher-level Mathematics course, or minimum of 95% in Academic Geometry. For students entering grade 11 or 12: ● Minimum of 85% in Honors Biology or minimum of 95% in Academic Biology and minimum of 85% in Academic Introduction to Physics, and Chemistry. ● Minimum of 80% in Honors Geometry or a higher-level Mathematics course, or minimum of 95% in Academic Geometry.		
	Honors Chemistry utilizes a problem-solving approach to chemistry requiring extensive use of algebra, geometry, and other mathematical processes. This course focuses on the mathematical solutions of chemical problems and the analytical use of experimental laboratory data in areas such as measurement, matter and energy, atomic structure, periodicity, and chemical reactions. Honors Chemistry is geared toward students who demonstrate strong skills in the areas of mathematics and science and meets 7/8 periods per week.		

Course Title:	Applied Science 1	**Credit Value:**	1.0
Course Number:	0981	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	No
Requirements:	● Approval by School Counselor and Science Department Chair.		
	This course is a part of a two-year course sequence in which the student will study the four major branches of science. Basic concepts of general science as it applies to everyday living are offered. This course will focus on the use of the scientific method to investigate elements of biology, the human body, elements of physics, motion and Newton's laws, and space science. This course is designed with the intent to have the student learn about a topic in science and then apply it to an everyday situation. The topics for Applied Science 1 will always be different from the topics in Applied Science 2 so that the student can earn two credits of science if desired (or needed for graduation) at the Senior High.		

Course Title:	Applied Science 2	**Credit Value:**	1.0
Course Number:	0982	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	No
Requirements:	● Approval by School Counselor and Science Department Chair		
	This course is part of a two-year course sequence in which the student will study the four major branches of science. Basic concepts of general science as it applies to everyday living are offered. This course will focus on the use of the scientific method to investigate elements of chemistry, physical and chemical changes, changes in the state of matter, elements of physics, waves, sound, light, optics, and electricity. This course is designed with the intent to have the student learn about a topic in science and then apply it to an everyday situation. The topics for Applied Science 1 will always be different from the topics in Applied Science 2 so that the student can earn two credits of science if desired (or needed for graduation) at the Senior High.		

Course Title:	Environmental Science	**Credit Value:**	1.0
Course Number:	0952	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Completion of an Introduction to Physics & Chemistry (or Chemistry) course and a Biology course		
	The goal of this course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world. Students will be required to gather and analyze information from many different disciplines. This course is a scientific study of the natural world and how it is influenced by people. Major topics include ecology, human population, Earth's resources, pollution, energy, biodiversity, and global change. Scientific inquiry is integrated throughout the course.		

Course Title:	Honors Environmental Science	**Credit Value:**	1.0
Course Number:	0954	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Minimum of 80% in Introduction to Physics & Chemistry (or Chemistry) course and minimum of 80% in a Biology course.		
	The Honors Environmental Science course is designed to engage students with the scientific principles, concepts, and methodologies required to understand the interrelationships within the natural world. The course requires that students 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 is interdisciplinary, embracing topics from geology, biology, environmental studies, environmental science, chemistry, and geography. This is stressed throughout the course of the year. Projects, current events and lab activities will play a critical role throughout the course.		

Course Title:	AP Environmental Science	**Credit Value:**	1.0
Course Number:	0955	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	• Minimum of 80% in honors biology or minimum of 90% in academic biology • Minimum of 80% in honors chemistry or minimum of 90% in academic chemistry		
	This course is a study of interrelationships that equip students with the necessary information to understand the complexity of environmental concerns, problems, and alternative courses of action. Interactions between human populations and their environment, as well as basic ecological principles, environmental policy, ethics, resource use, and conservation, are addressed. Students will study environmental problems, both natural and human-made, to evaluate the relative risks associated with these problems and examine alternative solutions for resolving and/or preventing those problems. Sustainability and scientific inquiry are weaved throughout the course. Lab activities and case studies will play a major role. Students should have developed skills in reading, writing, biology, chemistry, and mathematics to support their work.		

Course Title:	Astronomy	**Credit Value:**	1.0
Course Number:	0962	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	• Completion of some level of Algebra 1		
	This course emphasizes historical contributions in the development of scientific thought about the earth and space. In this course, we will explore our universe. Students will first learn about Earth and the celestial sphere, seasons, models of the universe, and the governing laws. Students will also learn about space explorations and colonization, the solar system, and the stars, including their features and evolution. Laboratory experiments, worksheets, field work, projects, Starry Night Computer Simulation, videos, and class discussion will enhance the student's understanding and appreciation of our precious planet and our amazing universe!		

Course Title:	Honors Astronomy	**Credit Value:**	1.0
Course Number:	0964	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	• Minimum of 80% in Algebra.		
	Astronomy is the science that deals with the study of the heavens and the realms extending from the Earth's atmosphere to the distant reaches of the universe. In this course, the topics that will be studied are stars and constellations, the solar system, celestial sphere, seasons, models of the universe, and the governing laws and principles that explain the Earth's systems and how the cosmos operates. The analysis and calculations of some topics are more in-depth than in the regular Astronomy course. It is recommended, but not required, that students be enrolled in or have completed a chemistry or physics course. This course CANNOT be taken concurrently with Astronomy.		

Course Title:	Academic Chemistry	**Credit Value:**	1.5
Course Number:	0913	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Minimum of 80% in Academic Algebra 1, minimum of 90% in Essentials of Algebra I Part 2 or minimum of 75% in a higher level Mathematics course. ● Minimum of 80% in Academic Introduction to Physics and Chemistry or minimum of 90% in Introduction to Physics and Chemistry.		
	Academic Chemistry is a college preparatory course that explores the fundamental principles of chemistry through classroom lecture and laboratory experimentation. This course covers the qualitative and quantitative aspects of scientific measurement, the nature of matter, atomic theory, nomenclature, chemical reactions, stoichiometry, chemical bonding, and more. Solving various mathematical problems related to chemical concepts is an integral part of the course. Academic Chemistry meets 7/8 periods per week.		

Course Title:	Honors Organic Chemistry	**Credit Value:**	1.0
Course Number:	0984	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Minimum of 80% in Honors Chemistry or minimum of 90% in Academic Chemistry ● Completion of Academic Algebra 2 or Honors Algebra 2		
	This is a demanding, lecture-oriented course that deals with the chemistry of carbon compounds, their structure, nomenclature, reaction mechanisms, and syntheses. It is roughly equivalent to one and a half semesters of college-level organic chemistry. Students who intend to pursue a career in chemistry, medicine, pharmacy, biology, nursing, or veterinary medicine will find this course extremely beneficial.		

Course Title:	AP Chemistry	**Credit Value:**	1.5
Course Number:	0915	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Minimum of 80% in Honors Chemistry or minimum of 90% in Academic Chemistry ● Completion of Academic Algebra 2 or Honors Algebra 2		
	The AP Chemistry course is designed to be the equivalent of two semesters of undergraduate introductory chemistry, usually taken by science/engineering majors during their first year of college. Textbooks and laboratory sessions are designed to cover the range and depths of college-level chemistry and will provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of chemistry.		

Course Title:	Honors Meteorology	**Credit Value:**	1.0
Course Number:	0983	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Current enrollment in, or completion of, any level of physics.		
	Students who take this course investigate the structure of severe storm systems, including super cell thunderstorms, hurricanes, and blizzards. They also explore and discuss ways to handle the dangers associated with them. Additionally, they become proficient in knowledge regarding weather basics, including the layers of the atmosphere, energy exchanges, formation of clouds, types of precipitation, weather instruments, atmospheric optics, and forecasting techniques. Current topics such as climate change, global warming, the thinning of the ozone layer, and alternative energy sources will also be studied. This course is conceptually based and uses only minimal mathematical skills.		

Course Title:	Academic Physics	**Credit Value:**	1.0
Course Number:	0923	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Completion of Academic Chemistry, Honors Chemistry, or concurrent enrollment in an engineering or aerospace course. ● Completion of some level of Algebra 1		
	This course is intended for college-bound students who are interested in a non-science career. Students will study the following topics: classical mechanics, waves, sound, optics, electrostatics, and magnetism. Although this class stresses concepts over computations, a basic knowledge of algebra, geometry, and trigonometry is required.		

Course Title:	Honors Physics	**Credit Value:**	1.5
Course Number:	0924	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Completion of Honors Chemistry or minimum of 90% in Academic Chemistry. ● Completion of Honors Algebra 2 or minimum of 90% in Academic Algebra 2.		
	This course stresses the mathematical and conceptual development of the following topics: mechanics, electricity, waves, sound, and optics. Mathematical problem-solving, including algebraic manipulation, systems of equations, trigonometric functions, logarithms, and graphical analysis are used extensively. Laboratory exercises are included to enhance the development of concepts and data analysis techniques. Honors physics is designed for the college-bound student and for the student preparing for the Advanced Placement 1 & 2 and C level courses. This course meets 7/8 periods each week.		

Course Title:	AP Physics 1&2	**Credit Value:**	1.5
Course Number:	0927	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Minimum of 80% in Honors Algebra 2 or minimum of 95% in Academic Algebra 2. ● Minimum of 80% in Honors Chemistry or minimum of 90% in Academic Chemistry.		
	The topics covered in AP Physics 1&2 include classical mechanics (linear and angular kinematics and dynamics and conservation laws), thermodynamics, fluid statics and dynamics, electricity and magnetism, waves and light, and topics in modern physics. The large number of objectives for the course and the highly analytical nature of the problem-solving make it very demanding. This course is equivalent to a two-semester terminal algebra-based physics course at the college-level. Mathematics, including trigonometry, geometry, and algebra will be used extensively in this course to solve problems and develop relationships between physical quantities. Please note that there are two separate AP exams associated with this course: one for AP Physics 1 and a second for AP Physics 2.		

Course Title:	AP Physics 1	**Credit Value:**	1.0
Course Number:	0925	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Minimum of 80% in Honors Algebra 2 or minimum of 95% in Academic Algebra 2. ● Minimum of 80% in Honors Chemistry or minimum of 90% in Academic Chemistry.		
	The topics covered in AP Physics 1 include classical mechanics (linear and angular kinematics and dynamics and conservation laws), waves, and fluid statics and dynamics. This course is equivalent to a one-semester algebra-based physics course at the college-level. The course is valuable to the student in two ways: the experience of having taken a college-level science class in high school will be a tremendous help when the student is in college. Secondly, the student will have the opportunity to take the AP Physics 1 exam at the end of the year. Mathematics, including trigonometry, geometry, and algebra, will be used extensively in this course to solve problems and develop relationships between physical quantities.		

Course Title:	AP Physics 2	**Credit Value:**	1.0
Course Number:	0926	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Minimum of 80% in Honors Physics or AP Physics 1.		
	This course is designed to meet the demands of the AP Physics 2 syllabus as published by the College Board. The first unit of Physics 2 builds on the last unit of Physics 1, exploring electrostatic phenomena in more detail, and then using this information to analyze electric circuits in greater depth. It is very important that students have a firm grasp of the basic concepts of physics, as only some of the material is reviewed. Topics for this course include electric field and circuit analysis, magnetism, fluid dynamics and thermodynamics, geometric & physical optics, modern topics, and atomic & nuclear physics. The student may earn college credit by taking the AP Physics 2 exam at the end of the year.		

Course Title:	AP Physics C	**Credit Value:**	1.5
Course Number:	0928	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Minimum of 80% in AP Chemistry or Honors Chemistry. ● Minimum of 80% in any other Physics course. ● Completion of or current enrollment in AP Calculus or Honors Calculus.		
	The AP Physics C course is designed to be the equivalent of two college introductory calculus-based physics courses. This course encompasses the calculus based Introductory Classical Mechanics, and the calculus based Introductory Classical Electricity and Magnetism course. These two courses are usually taken by science/engineering majors during their first or second year of college. Textbooks and laboratory sessions are designed to cover the range and depths of college-level calculus-based classical mechanics and classical electricity and magnetism, and it will provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of physics.		

Course Title:	Academic Anatomy & Physiology	**Credit Value:**	1.0
Course Number:	0943	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Completion of some level of Biology.		
	Academic Anatomy & Physiology is designed for students who are interested in learning about the structures and functions of body systems, their interactions, and disorders affecting those systems. A considerable amount of time will be devoted to lab work (modeling, simulations, and dissection), lectures, cooperative group learning, hands-on activities, and demonstrations. This course is recommended for any student interested in furthering their understanding of the human body.		

Course Title:	Honors Anatomy & Physiology	**Credit Value:**	1.0
Course Number:	0944	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Completion of Honors Biology OR minimum of 80% in Academic Biology, OR minimum of 90% in Academic Anatomy & Physiology. ● Minimum of 80% in Academic Chemistry OR minimum of 75% in Honors Chemistry.		
	This course is designed for college-bound students who are interested in the structure and function of the major systems in the human body. Considerable time is devoted to lecture, clinical, practical, and laboratory applications. Honors Anatomy and Physiology is recommended for college-bound students, especially those interested in a medical or science related field.		

Course Title:	AP Biology	**Credit Value:**	1.5
Course Number:	0905	**STEM:**	Yes
Open to Grade(s):	11-12	**NCAA:**	Yes
Requirements:	● Minimum of 80% in Honors Biology OR 90% in Academic Biology. ● Minimum of 75% in Honors Chemistry OR minimum of 93% in Academic Chemistry.		
	AP Biology is the equivalent of a one-year college or university course in biology, taught within the parameters of high school. Students explore fundamental concepts in the life sciences that are structured around the four big ideas, enduring understandings, and science practices that are defined by the *AP Biology Curriculum Framework.* Students will also develop advanced reasoning skills, such as designing a plan for collecting data, analyzing data, applying mathematical routines, and connecting concepts in and across all domains of life. As students develop an appreciation for the study of life, they will be able to identify and understand unifying principles within a diversified biological world. Because our understanding of biology today is a result of inquiry, the process of inquiry in science and developing critical thinking skills is one of the most important parts of this course.		