ENGLISH

SMA Honors English 9 (SMA10071) ***State Code 1130***
Grade Level: 9
Level of Difficulty: Honors
Credit: 1 unit
Weight: .025
Prerequisite: English 8 or Honors English 8
Standard of Learning End-of-course Test: No
Course Description: Students present and critique dramatic reading and make planned oral presentations. The course emphasizes precision in the use of language, both orally and in writing, and the use of standard grammar, usage, and mechanics. Students develop a variety of writing samples using technology to access and organize information. Students utilize technical writing components with a focus on writing for the science and medical industries.

SMA Honors English 10 (SMA11071) ***State Code 1140***
Grade Level 10
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: SMA Honors English 9
Standard of Learning End-of-Course Test: No
Course Description: Students study American literature and analyze the relationship of American history, literature, and culture. Students use the writing process to develop expository and persuasive essays by locating, evaluating, synthesizing, and citing applicable information with careful attention to organization and accuracy. Students participate in small-group learning activities and analyze informational materials. In addition, students review standard grammar and usage. Utilizing a variety of sources and a prescribed format, students compose a documented paper and deliver a persuasive presentation.

Honors English 11 (12021) ***State Code 1150***
Grade Level: 11
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: SMA Honors English 10
Standard of Learning End-of-Course Test: Yes
Course Description: Students engage in intensive reading and analysis of American informational text and American literature, evaluate print materials, write a documented research paper based on literary criticism, compose expository essays evolving from their reading and research, and generate technical writings. In addition, students deliver and evaluate persuasive presentations, as well as engage in additional parallel reading.

Advanced Placement English Language and Composition (12141) ***State Code 1196***

Grade Level: 11
Level of Difficulty: Advanced Placement
Credit: 2 Units
Weight: .05
Prerequisite: SMA Honors English 10
Standard of Learning End-of-Course Test: Yes
Course Description: This is a college-level course designed in accordance with the requirements of the College Board. The *Advanced Placement English Language and Composition* course provides students who are interested in studying and writing various kinds of analytic and persuasive essays on nonliterary topics with a college-level English emphasis in language, rhetoric, and expository writing. Students also are required to complete summer reading according to each school's College Board approved syllabus. Students in AP English Language and Composition spend their time reading and writing, as well as engaging in discourse about their reading and writing with attention to rhetorical and compositional elements. Through exposure to various genres, voices, and ideas, students' reading experiences are broadened. Their levels of appreciation and enjoyment as well as their critical thinking skills are enhanced. In addition, the students analyze classic works, conduct research, and make an oral presentation. The course culminates in the Advanced Placement examination given in May of each year. Students who enroll in this course should have a comprehensive knowledge of Standard English grammar. This course may be taken instead of SMA Honors English 11 (779).

Honors English 12 (13021) ***State Code 1160***

Grade Level: 12
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Honors English 11
Course Description: Students interpret the meaning of selected masterpieces of world literature through critical analysis. During the study of the composing process, students focus on rhetoric and logic for the purpose of developing individual style. Students engage in additional parallel and summer reading. (Students must have successfully completed the required English courses which include the English Standards of Learning for Grades 9, 10, and 11, before enrolling in this course).

Advanced Placement English Literature and Composition (13141) ***State Code 1195***
Grade Level: 12
Level of Difficulty: Advanced Placement
Credit: 2 Units
Weight: .05
Prerequisite: Honors English 11 or Advanced Placement English Language and Composition
Course Description: This is a college-level course designed in accordance with the requirements of the College Board. Advanced Placement English Literature and Composition prepares students by developing their interpretive reading skills and their critical/analytical writing skills on a college level. While emphasizing writing techniques and literary analysis, this course exposes students to a wealth of classical and modern literature. Through intensive study of literature and frequent written exercises, students learn strategies to express ideas in an organized, coherent, and persuasive manner. The course culminates in the Advanced Placement examination given in May of each year. Students also are required to complete summer reading according to each school's College Board approved syllabus. This course may be taken instead of SMA Honors English 12 (780).

College Composition I & II (13351/13451) ***State Code DE1600/DE1601***
Grade Level: 12
Level of Difficulty: Dual Enrollment
Credit: 2 Units
Weight: .05
Prerequisite: SMA Honors English 11
Course Description: This rigorous course is offered for dual enrollment between Chesapeake Public Schools and Tidewater Community College. Students will study and produce college-level composition. The first semester elective credit course provides 3 credit hours of college study. Upon successful completion of the second semester course of study the student earns both the state of Virginia requisite credit for Grade 12 and 3 credits of college study. Students must complete both semesters to meet Grade 12 graduation requirements. Students must be self-motivated and should possess a strong background in English grammar and usage.

SOCIAL STUDIES

SMA Honors Social Studies 9: World History and Geography I (SMA40021) ***State Code 2215***
Grade Level: 9
Level of Difficulty: Honors
Credit: 1 unit
Weight: .025
Prerequisite: Accelerate/Honors Placement requirements
Standard of Learning End-of-Course Test: Yes
Course Description: This course is an in-depth study of the backgrounds and development of world civilizations. Students develop critical thinking skills through analysis and research, essay writing, and discussion. Selected knowledge areas include the role of physical geography as it has influenced and hindered the development of cultures from man's prehistory through the Renaissance. The course introduces the industrialization of key figures, key discoveries, key inventions and innovations in both the fields of science and medicine.

SMA Honors Social Studies 10: World History and Geography 1500 A.D. to the Present (SMA41021) ***State Code 2216***
Grade Level: 10
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Honors Social Studies 9: World History and Geography to 1500 A.D. and Accelerated/Honors Placement Requirements
Standard of Learning End-of-Course Test: Yes
Course Description: This course is an in-depth study of the events of world history from the Renaissance through modern times. Selected knowledge areas include the coverage of the role of physical geography as it has influenced and hindered the development of world cultures. Specific attention concentrates on the emergence of strong national states, the age of revolutions, and the problems that exist today in modern nations. Various components of culture are addressed for comparison of similarities and differences of modern nations.

Advanced Placement: European History (41241) ***State Code 2399***
Grade Level: 10
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: .05
Prerequisite: Accelerated/Honors Placement Requirements
Standard of Learning End-of-Course Test: Yes
Course Description: This course is a freshman college level study of European history from the period of the Renaissance to the present. This period of emphasis recognizes the major topics covered by recent Advanced Placement European History examinations. The course is designed to cover two semesters, with the triumph of the bourgeoisie as a dividing point. In-depth study will focus on the interpretation of social, intellectual, and political themes that have changed the course of direction for the world. This course may be taken instead of SMA Honors Social Studies 10: World History and Geography (771).

Honors Social Studies 11: Virginia and United States History (42021) ***State Code 2360***
Grade Level: 11
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Accelerated/Honors Placement Requirements
Standard of Learning End-of-Course Test: Yes
Course Description: The course is an in-depth study of the period in United States history beginning with the Age of Exploration. Major focus is given to the growth and development of the United States as a world leader. Selected knowledge areas address the various ideas, thoughts, and philosophies that were the backbone of the political, economic, and social contributions of various groups of people throughout the important stages of development.

Advanced Placement: United States History (42141) ***State Code 2319***
Grade Level: 11
Level of Difficulty: Advanced Placement
Credit: 2 Units
Weight: .05
Prerequisite: Accelerated/Honors Placement Requirements
Standard of Learning End-of-Course Test: Yes
Course Description: This course is a freshman college level study of American history from colonization to the present with special emphasis during the period 1790 to 1965. This period of emphasis recognizes the major topics covered by recent Advanced Placement American History examinations. The course is designed to cover two semesters with the period of Reconstruction (l877) as the dividing point. This course may be taken instead of SMA Honors Social Studies 11: Virginia and United States History (792).

Dual Enrollment United States History 1 & 2 (42351/42451) ***State Code***
Grade Level: 11
Level of Difficulty: Dual Enrollment
Credit: 2 Credits (1 Elective and 1 Social Science)
Weight: 0.05 per credit
Prerequisite: *Honors Placement Requirements Recommended; Students must have placed into English 111 at TCC*
Standard of Learning End-of-Course Test: Yes

Course Description: This rigorous course is offered for dual enrollment between Chesapeake Public Schools and Tidewater Community College. Students will study and survey college-level United States History from its beginning to the present. The first semester course (HIS 121) focuses on United States History from Colonization through Reconstruction and provides three credit hours. The second semester course (HIS 122) surveys from Reconstruction to the Present, and provides another three credit hours. Upon successful completion of both semesters, the student earns both the state of Virginia requisite credit for VA/US History and six credits of college study. Students must complete and pass both semesters to meet graduation requirements. Students should be highly motivated and must have placed into English 111 at TCC as a co-requisite.

Honors Social Studies 12: Virginia and United States Government (43021) ***State Code 2440***
Grade Level: 12
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Accelerated/Honors Placement Requirements
Standard of Learning End-of-Course Test: No
Course Description: This course is an in-depth study that provides a comprehensive analysis of the American political and economic system with a comparison to that of other political and economic systems; and, a comprehensive analysis of the national court system with emphasis on court structure and landmark court cases. Major focus is given to the examination of civil rights and civil liberties. Local government is emphasized both through the relationship with the state and federal government and with current issues.

Advanced Placement: Government and Politics (43141) ***State Code 2445***
Grade Level: 12
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: .05
Prerequisite: Accelerated/Honors Placement Requirements
Standard of Learning End-of-Course Test: No
Course Description: This course is a freshman college level study of a critical perspective on government and politics in the United States. This course involves both the study of general concepts used to interpret American politics (local, state, and national levels) and the analysis of specific case studies familiarizing the student with various institutions, groups, beliefs and ideas that make up the American political reality. The course presents a thematic approach and recognizes the major topics covered by recent Advanced Placement Government and Politics examinations. This course may be taken instead of SMA Honors Social Studies 12: Virginia and United States Government (794).

MATH

SMA Honors Geometry (SMA22071) ***State Code 3143***
Grade Level: 9
Level of Difficult: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Algebra 1
Standard of Learning End-of-Course Test: Yes
Course Description: Students learn the principles of geometry and are required to demonstrate logical problem-solving techniques. Topics include introductions to truth tables, negations, quantifiers, vectors and matrices, and three-dimensional coordinates. Students analyze real-world applications and problem-solving techniques of mathematical principles as they relate to science and medicine.

SMA Honors Algebra 2/Trigonometry (SMA23271) ***State Code 3137***
Grade Level: 9 or 10
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Geometry
Standard of Learning End-of-Course Test: Yes
Course Description: This course combines all of the traditional Algebra 2 and Trigonometry objectives with additional topics including probability and statistics. Emphasis is placed on matrices, functions, graphing and trigonometry. Students demonstrate proficiency in solving problems using algebraic and graphing methods and a graphing calculator. Students use real-world applications and problem-solving of mathematical principles as they relate to science and medicine.

SMA Mathematical Analysis (SMA25071) ***State Code 3162***
Grade Level: 10 or 11
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Standard of Learning End-of-Course Test: No
Prerequisite: Trigonometry/Probability and Statistics (3149)
Course Description: This comprehensive course is intended to develop student understanding and application of algebraic and transcendental functions, parametric and polar equations, sequences and series, and vectors. The content of this course will help prepare the student for Calculus. Graphing calculators will be used as a tool to verify and investigate mathematical concepts and ideas.

SMA Calculus (SMA25171) ***State Code 3178***
Grade Level: 11 or 12
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Standard of Learning End-of-Course Test: No
Prerequisite: SMA Honors Mathematical Analysis (785)
Course Description: This course is intended for students who have a thorough knowledge of analytic geometry, and functions (including trigonometric functions, logarithmic functions, and exponential functions). The course provides students with a study of limits, continuity of functions, the derivative and its applications, and the definite integral and its applications. All topics will be investigated analytically, numerically and graphically. Graphing calculators will be used as a tool to verify and investigate mathematical concepts and ideas. This course can be used to prepare students for the rigors of Advanced Placement Calculus AB (789).

Advanced Placement Calculus - AB (25241) ***State Code 3177***
Grade Level: 11 or 12
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: .05
Advanced Placement End-of-Course Test: Yes
Prerequisite: SMA Calculus (786)
Course Description: This course is equivalent to a first semester college calculus course. The topics are aligned with the College Board Advanced Placement Course Description which states "Calculus AB is primarily concerned with developing the students' understanding of the concepts of calculus and providing experience with its methods and applications. The course emphasizes a multirepresentational approach to calculus, with concepts, results, and problems being expressed graphically, numerically, analytically, and verbally. The connections among these representations also are important." Graphing calculators are mandatory but will be used sparingly. Visit the College Board website for a detailed course description. (www.collegeboard.com)

Advanced Placement Calculus - BC (25341) ***State Code 3177***
Grade Level: 11 or 12
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: .05
Advanced Placement End-of-Course Test: Yes
Prerequisite: Advanced Placement Calculus AB (789)
Course Description: This is a challenging and demanding course that is equivalent to a second semester college calculus course. The topics are aligned with the College Board Advanced Placement Course Description which states that Calculus BC contains "extensions of Calculus AB rather than an enhancement; common topics require a similar depth of understanding." New topics are sequences and series, parametric and polar functions, Euler's method, improper integrals, and various integration techniques. Visit the College Board website for a detailed course description. Graphing calculators are mandatory but will be used sparingly. A thorough review of all topics covered in Advanced Placement Calculus AB and BC will be conducted in preparation for the national exam.

Advanced Placement Statistics (24241) ***State Code 3192***
Grade Level: 12
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: .05
Advanced Placement End-of-Course Test: Yes
Prerequisite: SMA Algebra II/Trigonometry (787)
Course Description: The topics for this course are aligned with the College Board Advanced Placement Course Description. It is stated "the purpose of this course is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: Exploring Data…Sampling and Experimentation…Anticipating Patterns…Statistical Inference." Visit the College Board website for a detailed course description. (www.collegeboard.com)

SCIENCE

SMA Principles of Earth Systems (SMA37071) ***State code 4210***
Grade Level: 9
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Accelerated/Honors Placement Requirements
Standard of Learning End-of-Course Test: Yes
Course Description: Principles of Earth Systems is a laboratory course, which connects the study of the Earth's composition, structure, processes, and history; its atmospheres, fresh water, and oceans; and its environment in space. This course stresses the interpretation of maps, charts, tables, and profiles; the uses of technology to collect, analyze, and report data; and the utilization of science skills in systematic investigations. This is a very rigorous course with a strong research component that uses the experimental design model of investigations. Principles of Earth Systems students will be challenged to learn, research, and utilize hand-on experiments in greater depth. Students formulate a basic understanding of and implied actions for the introduced science and medical issues.

SMA Contemporary Science Investigations in Biology (SMA37271) ***State Code 4310***
Grade Level: 9
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Principles of Earth Systems
Standard of Learning End-of-Course: Yes
Course Description: This course is designed to give students a detailed, in-depth understanding of living systems. Emphasis is placed on the skills necessary to examine scientific explanations, to conduct controlled experiments, to analyze and communicate information, and to use scientific literature. The history of biological thought, and the evidence that supports it, is explored; they provide the foundation for scientific investigation. This rigorous course contains strong research components, which enable students to apply scientific concepts. Students will learn and research, utilizing both classroom experimentation and literature reviews from written and electronic resources. Students will utilize medical terminology and current science and medical trends/issues in our society.

SMA Honors Medicinal Chemistry (SMA37671) ***State code 4410***
Grade Level: 10
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Accelerate/Honors Placement requirements
Standard of Learning End-of-Course Test: Yes
Course Description: Medicinal Chemistry is a laboratory course, which allows the students to conduct laboratory experiments which involve short and long-term bacterial studies as well as computer modeling and basic drug design. Medicinal and pharmaceutical research is an integral part of the health professions. Through this course, students will apply their knowledge of the life sciences to extend their understanding of biochemistry and pharmacology. This course focuses on pharmaceutical development practices and strategies at the molecular level. In addition, they will investigate the structure, function, and therapeutic administration of chemical compounds. Students will write medical journal quality research papers, which reinforce topics that will be emphasized throughout the course. The course activities will emphasize research skills; critical thinking and problem solving will be emphasized. These skills will be encouraged through inquiry-based activities and challenging research investigations.

SMA Astronomy (SMA37171) ***State code 4260***
Grade Level: 10^{th} or 11^{th}
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Academy Placement Requirements
Standard of Learning End-of-Course Test: No
Course Description: Astronomy is a laboratory course, which connects the study of the Earth's celestial coordinates, telescopes, the Solar System, the orbit of the moon, H-R diagrams, the nature of light, and the age of the Universe. As students learn more about astronomy, they will appreciate just how much astronomy has affected and continues to affect their lives. This course is designed to give students an in-depth understanding of the universe. The course is focused on organizing facts into logical hypothesis, testing that hypothesis, and coming up with a feasible conclusion. The course requires investigating new and historical astronomy, utilizing the newest technology, and the use of deductive reasoning.

SMA Forensic Science (SMA37771) ***State code 4610***
Grade Level: 10th or 11th
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Prerequisite: Academy Placement Requirements
Standard of Learning End-of-Course Test: No
Course Description: Forensic Science is a laboratory course, which allows the students to take on the various roles of a crime scene investigator, scientist, and medical examiner in order to collect and evaluate evidence in a problem-solving environment. Students will develop scientific bench techniques necessary for the handling and evaluation of evidence. Students will develop the field skills necessary to collect and maintain a chain of evidence, explore the history of DNA studies and the current standard acceptance of DNA in courts, and explore career opportunities involved in the medical, law enforcement, scientific, and legal aspects of forensic investigation.

Honors Physics (33021) ***State Code 4510***
Grade Level: 11th or 12th
Level of Difficulty: Honors
Credit: 1 Unit
Weight: 0.025
Prerequisite: Accelerated/Honors Placement Requirements
Science Prerequisite(s): Principles of Earth Systems, CSI in Biology and Medicinal Chemistry are Strongly Recommended
Mathematics Prerequisite(s): Algebra II
Standard of Learning End-of-Course Test: No
Course Description: This course emphasizes a more complex understanding of experimentation, the analysis of data, and the use of reasoning and logic to evaluate and validate evidence. The use of mathematics (including algebra, inferential statistics, and trigonometry) is an important component. A conceptual framework of the physical systems and the laws governing matter and energy are the primary objectives of this course. The practical application of physics in other areas of science, the use of technology and the role of physics in the world are emphasized.

SMA Animal Science (SMA37571) ***State code 4611***
Grade Level: 11th or 12th
Level of Difficulty: Accelerated
Credit: 1 unit
Weight: TBD
Prerequisite: Earth Systems, CSI in Biology, Medicinal Chemistry and Human Anatomy and Pathophysiology.
Standard of Learning End-of-Course Test: No
Course Description: Animal Science is a laboratory course, which allows the student to be introduced to the foundations for veterinary medical language and basic anatomy & physiology. Positional, directional and planes of body and body cavity terminology will be discussed. The course will introduce basic concepts and principles of animal nutrition, growth, health, behavior, reproduction, and genetics, as well as practical applications, such as disease prevention, genetic selection, and crossbreeding systems.

SMA Human Movement Science (SMA38371) ***State code 4612***
Grade Level: 11th or 12th
Level of Difficulty: Accelerated
Credit: 1 unit
Weight: .05
Prerequisite: Earth Systems, CSI in Biology, Medicinal Chemistry and Human Anatomy and Pathophysiology.
Standard of Learning End-of-Course Test: No
Course Description: Human Movement Science is a laboratory course, which allows the student to learn proper anatomy, physiology, and biomechanical functions of the joints, muscles and ligaments in the body and will be able to identify and make decisions about injuries. Sports medicine is a branch of healthcare devoted to the application of medical knowledge and expertise to the prevention, diagnosis, treatment, and management of injuries related to participation in sports, exercise, and other physical and recreational activities. This course will help students get a better understanding of how sports medicine factors into athletic injuries. Each student will participate in practical applications of modern athletic training including post injury care, application and instruction in Physical Therapy techniques, Sports Massage, Strength & Conditioning and athletic Rehabilitation therapy. At the end of the course, students will be CPR and First Aid Certified.

SMA Molecular Genetics and Biotechnology (SMA37471) ***State code 4611***
Grade Level: 11th or 12th
Level of Difficulty: Accelerated
Credit: 1 unit
Weight: .05
Prerequisite: Earth Systems, CSI in Biology, and Medicinal Chemistry.
Standard of Learning End-of-Course Test: No
Course Description: Molecular biotechnology results from the convergence of many areas of research, such as molecular biology, microbiology, biochemistry, immunology, genetics, and cell biology. It is an exciting field fueled by the ability to transfer genetic information between organisms with the goal of understanding important biological processes or creating a useful product. Students will learn about genetic engineering and why new vaccines are being created, how plants and animals are being genetically altered to meet the world's demands, DNA fingerprinting, stem cell research, and how microbes are being harvested for energy efficiency. The students will connect what is learned in the classroom with instruction and experiences related to the science and medical fields. The tools of molecular biotechnology can be applied to develop and improve drugs, vaccines, therapies, and diagnostic tests that will improve human and animal health. Molecular biotechnology has applications in plant and animal agriculture, aquaculture, chemical and textile manufacturing, forestry, and food processing. Every aspect of our lives in the coming decades will be affected by this dynamic field.

SMA Advanced Placement Environmental Science (SMA38071) ***State code 4270***
Grade Level: 11th or 12th
Level of Difficulty: Advanced Placement
Credit: 1 unit
Weight: .05
Prerequisite: Earth Systems, CSI in Biology, and Medicinal Chemistry.
Standard of Learning End-of-Course Test: No
Course Description: The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them. This course is designed to prepare students for the Advanced Placement examination in chemistry to receive college credit. Completion of an investigative research project is an expectation of all Advanced Placement Environmental Science students.

SMA Advanced Placement Biology (37371) ***State Code 4370***
Grade Level: 11th or 12th
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: .05
Level of Difficulty: College Level
Prerequisite(s): Earth Systems, CSI in Biology, and Medicinal Chemistry
Standard of Learning End-of-Course Test: No
Course Description: Advanced Placement Biology is designed to place emphasis upon the major topics covered in introductory college level biology courses. Molecular, cellular, organism, and population biology are stressed. Students also develop an understanding of the characteristics, the unity, and the diversity of living things while collecting, analyzing, and interpreting biological data. This course is also designed to prepare students to achieve a satisfactory score on the Advanced Placement examination in biology to receive college credit. In meeting the rigorous course standards, students will be encouraged to share their ideas, use the language of biology, discuss problem-solving techniques, and communicate effectively. Advanced Placement biology students will be challenged to learn, to research, utilizing both classroom experimentation and literature reviews from written and electronic resources, and to present topics in biology in greater depth. Completion of an investigative research project is an expectation of all Advanced Placement biology students.

SMA Advanced Placement Chemistry (37871) ***State Code 4470***
Grade Level: 11th or 12th
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: .05
Level of Difficulty: College Level
Science Prerequisite(s): Earth Systems, CSI in Biology, Medicinal Chemistry
Mathematics Prerequisite(s): Algebra II and a higher-level math course
Standard of Learning End-of-Course Test: No
Course Description: This course is designed to place emphasis on the major topics covered in introductory college level chemistry courses. This college level course will provide a depth of understanding of the fundamentals and competencies needed to apply chemical calculations and the mathematical formulation of principles. This course is designed to prepare students for the Advanced Placement examination in chemistry to receive college credit. In meeting the rigorous course standards, students will be encouraged to share their ideas, use the language of chemistry, discuss problem-solving techniques, and communicate effectively. Advanced Placement chemistry students will be challenged to learn, to research, utilizing both classroom experimentation and literature reviews from written and electronic resources, and to present topics in chemistry in greater depth. Completion of an investigative research project is an expectation of all Advanced Placement chemistry students.

Advanced Placement Physics 1 (33041) ***State Code 4573***
Grade Level: 11th or 12th
Level of Difficulty: Advanced Placement
Credit: 1Unit
Weight: 0.05
Science Prerequisite(s): Principles of Earth Systems, CSI in Biology and Medicinal Chemistry are Strongly Recommended.
Mathematics Prerequisite(s): Successful Completion of Algebra II is required
Standard of Learning End-of-Course Test: No
Course Description: This course is designed to place emphasis on principal topics covered in a first-semester college course in algebra-based physics. AP Physics 1 is Algebra-Based. The course covers Newtonian mechanics (including rotational dynamics and angular momentum); work, energy, and power; mechanical waves and sound. It will also introduce electric circuits. This course is designed to prepare students for the Advanced Placement examination in AP Physics 1. Completion of an investigative research project is an expectation of all Advanced Placement physics students.
Special Note: Starting the 2014-2015 school year, AP Physics B was replaced by AP Physics 1 and AP Physics 2.

Advanced Placement Physics 2 (33142) ***State Code 4574***
Grade Level: 11th or 12th
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: 0.05
Science Prerequisite(s): Principles of Earth Systems, CSI in Biology and Medicinal Chemistry are Strongly Recommended. AP Physics 1 is required.
Mathematics Prerequisite(s): Successful Completion of Algebra II is required and One Higher Math Course is Highly Recommended
Standard of Learning End-of-Course Test: No
Course Description: This course is designed to place emphasis on principal topics covered in a second-semester college course in algebra-based physics. AP Physics 2 is Algebra-Based. The course covers fluid mechanics; thermodynamics; electricity and magnetism; optics; atomic and nuclear physics. This course is designed to prepare students for the Advanced Placement examination in AP Physics 2. Completion of an investigative research project is an expectation of all Advanced Placement physics students.
Special Note: Starting the 2014-2015 school year, AP Physics B was replaced by AP Physics 1 and AP Physics 2.

SMA Advanced Senior Seminar (SMA38271) ***State code 4612***
Grade Level: 12th
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Level of Difficulty: Intensified Honors
Science Prerequisite(s): Earth Systems, CSI in Biology and/or Medicinal Chemistry, a minimum of 4 additional elective SMA courses and a minimum of 20 hours of Job Shadowing.
Standard of Learning End-of-Course Test: No
Course Description: The goal of the Science and Medicine Academy is to introduce students to the vast field of science and medical careers. The focus is to give each student rigorous academic coursework necessary to compete in post-secondary institutions. The student will be introduced to a work-related learning experience where they will develop hands on work experience in a certain occupational field or gain the relevant knowledge and skills required to enter into a particular career field. This internships will be short term in nature with the primary focus of getting some on the job training and taking what's learned in the classroom and applying it to the real world. This advanced seminar will help develop professional work habits; provides an understanding of corporate cultures, and offer a platform to compare differences in work styles. Students will be required to complete a minimum of 60 hours of hands on training. Students must complete an internal assessment in the form of a presentation and an external assessment in the form of a 1200-1600 word essay that addresses the students' skills, attitude and awareness of the career field of internship.

PLTW (Biomedical Sciences)

Principles of Biomedical Science (*PBS)*
Grade Level: 10^{th} – 12^{th}
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Level of Difficulty: Intensified Honors
Science Prerequisite(s): Earth Systems, CSI in Biology and/or Medicinal Chemistry
Course Description: In the introductory course of the PLTW Biomedical Science program, students explore concepts of biology and medicine to determine factors that led to the death of a fictional person. While investigating the case, students examine autopsy reports, investigate medical history, and explore medical treatments that might have prolonged the person's life. The activities and projects introduce students to human physiology, basic biology, medicine, and research processes while allowing them to design their own experiments to solve problems.

Human Body Systems *(HBS)*
Grade Level: 10^{th} – 12^{th}
Level of Difficulty: Honors
Credit: 1 Unit
Weight: .025
Level of Difficulty: Intensified Honors
Science Prerequisite(s): Earth Systems, CSI in Biology and/or Medicinal Chemistry and Principles of Biomedical Sciences (PBS)
Course Description: Students examine the interactions of human body systems as they explore identity, power, movement, protection, and homeostasis. Exploring science in action, students build organs and tissues on a skeletal Maniken®; use data acquisition software to monitor body functions such as muscle movement, reflex and voluntary action, and respiration; and take on the roles of biomedical professionals to solve real-world medical cases.

Medical Interventions *(MI)*
Grade Level: 11th or 12th
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: 0.05
Science Prerequisite(s): Principles of Earth Systems, CSI in Biology and Medicinal Chemistry, PBS and HBS
Course Description: Students follow the life of a fictitious family as they investigate how to prevent, diagnose, and treat disease. Students explore how to detect and fight infection; screen and evaluate the code in human DNA; evaluate cancer treatment options; and prevail when the organs of the body begin to fail. Through real-world cases, students are exposed to a range of interventions related to immunology, surgery, genetics, pharmacology, medical devices, and diagnostics.

Biomedical Innovation *(BI)*
Grade Level: 11th or 12th
Level of Difficulty: Advanced Placement
Credit: 1 Unit
Weight: 0.05
Science Prerequisite(s): Principles of Earth Systems, CSI in Biology and Medicinal Chemistry, PBS, HBS, and MI
Course Description: In the final course of the PLTW Biomedical Science sequence, students build on the knowledge and skills gained from previous courses to design innovative solutions for the most pressing health challenges of the 21st century. Students address topics ranging from public health and biomedical engineering to clinical medicine and physiology. They have the opportunity to work on an independent design project with a mentor or advisor from a university, medical facility, or research institution.