George Washington Carver
Engineering and Science

# Course Offering Book

# 2017 - 2018

Ted M. Domers, Ed.D
Principal

John Kalicki
Roster Chair

January 23, 2017

Dear Carver HSES Students and Families:

It is with great excitement that I share our coursebook for the 2016-17 academic year. I believe it is essential for students to thoughtfully select courses that interest and challenge them. In making these important decisions, it is also critical for families to play an active role in this process alongside their student. I hope this coursebook provides the foundation for you to make these important decisions.

This comprehensive resource provides a range of information for you to examine. It reviews the graduation requirements for all students, highlights our different pathways, and gives a detailed description for every class we offer. As you prepare to read the book and select your courses, I invite you to consider the following questions:

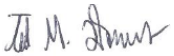
1. *What interests you?*
   We present a range of science pathways as well as electives in the humanities. You should consider what you are curious about and what issues you would like to learn more about. In doing so, you should plan accordingly. What classes should you take in 10th grade to prepare you for courses in 11th and 12th grade?

2. *Are you challenging yourself?*
   We offer 15 Advanced Placement (AP) courses that you can begin taking in 10th grade. I expect every Carver HSES student will take an AP course before graduating. Consider a topic that interests you and when you would like to take the course. Allow this information to help guide your planning for your upcoming year and future course plans.

3. *Are you on track to graduate?*
   We take great pride in the range of options we provide students and our flexibility to accommodate student interests and course requests. We do everything in our power to create academic programs that support your interests and needs. However, it is also critical to ensure that students are taking the necessary courses every year to graduate.

I look forward to moving forward with this process alongside you as you develop a strong academic identity through your high school experience. I hope you find this coursebook a meaningful resource. Please let me know if you have any additional questions.

Sincerely,



Ted M. Domers
Principal

## TIMELINE

| | |
|---|---|
| January 31-February 2: | Overview Assemblies |
| February 6-10: | Office Hours: Mr. Kalicki, Ms. Boyer , Ms. Finch |
| February 8 & 9: | Pathway Presentations |
| February 9: | Family Informational Meeting (6PM) |
| February 13-23: | Individual Course Selection |
| February 27: | Individual Course Selection Ends |
| June 13: | SY1718 Roster Distribution |

## COURSE DESCRIPTIONS INDEX

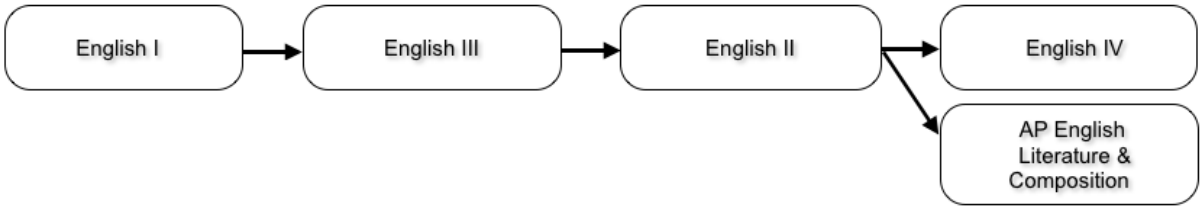


## GRADUATION REQUIREMENTS

| | |
|---|---|
| English | 4 credits |
| Social Studies | 4 credits |
| Math | 4 credits |
| Science | 4 credits |
| World Language | 2 credits |
| Health Education | ½ credit |
| Physical Education | 1 credit |
| Arts & Humanities | 2 credits |

A total of 23.5 credits are required to graduate.

**0. ENGLISH**




**Graduation requirements: Students must pass English I, English II, English III, and either English IV or AP English Language and Composition.**

**English 1**
Search for Self is the overarching theme for grade 9. Instruction in grade 9 is designed to review and reinforce the skills acquired in grades 1-8. The goal is to have students sharpen and polish those skills, so they may begin to apply what they have learned to more challenging reading, writing, and thinking activities. English I begins a close analysis of fiction and the author's craft. Students will focus on grammar, etymology, vocabulary development, and the writing process. Embedded in the course of study are nonfiction analyses, research, and writing in all modes: narrative, informational, and persuasive.

**English 1 Honors**
*Prerequisite: Minimum of a 90 scored on the English placement test or permission of the instructor.*
This course emphasizes advanced and intensive study of vocabulary, grammar, writing and literary analysis techniques. Students will study several units of vocabulary containing Greek and Latin roots as well as an intensive grammar review. Writing involves a review of the basic paragraph structure which once mastered will proceed to students learning and practicing essay writing as well as paraphrasing and summarizing informational selections by understanding how to identify essential ideas. Students will learn how to generate research questions from print and internet sources and the difference between primary and secondary sources. Literature will focus on the analysis and evaluation of the elements of the genres of short story, novel and various types of poetry. In addition, students will analyze the characteristics of the epic poem and the drama as they will read *The Odyssey and Romeo and Juliet.* This course proceeds at a more intensive level and accelerated pace than the standard English I course.

**English 2**
*Prerequisite: English I.* The tenth grade English curriculum focuses on literature from around the world that explores the theme of Social Justice through centuries and across continents and cultures. Students engage in informational, persuasive, and narrative writing while preparing for the PSAT, SAT, and Keystone.

**English 2 Honors**
*Prerequisite: Minimum of an 85 average in English I, recommendation of the ninth grade English teacher, and permission of the English Department Chairperson.* This course emphasizes advanced composition techniques and various genres in world literature. Students also study vocabulary, SAT preparation, language skills, and engage in writing for publication, including submission to magazines and writing contests. Students read, intensively analyze, and evaluate several works of literature. Students will also strengthen their research skills and complete a short research paper in MLA format. This course proceeds at a more intensive level and accelerated pace than the standard English II course.

**English 3**
*Prerequisites: English I & English II.* Students will apply the skills learned in grade 9 and practiced in grade 10 to more challenging texts and writing assignments. The focus is on Finding America through an analysis of American literature. Literary analysis is in the forefront of the instructional program. Students will grow in their understanding of the evolution of the American identity. Students are learning the elements of style and rhetoric as they prepare to become more critical readers, writers, and thinkers. Informational and persuasive writing are emphasized in English III. Reading, writing, and literary analysis are designed to prepare students for independent learning and assessments such as the PSAT and SAT.

**English 3 Honors**
*Prerequisite: Minimum of an 85 average in English II or English II Honors, recommendation of the tenth grade English teacher, and permission of the English Department Chairperson.* This course emphasizes advanced composition techniques and various genres in American literature. Students also study vocabulary, SAT preparation, language skills, and participate in writing contests, several of which require creative writing skills. Students read, intensively analyze, and evaluate several works of literature. Students will also strengthen their research skills and complete a short research paper. This course proceeds at a more intensive level and accelerated pace than the standard English III course.

**English 4 Traditional**
*Prerequisites: English I, English II, and English III.* The twelfth grade English curriculum prepares students for continuing education, lifelong learning, and the journey into the adult world. Under the Man and Society umbrella, students read, write, analyze and research increasingly complex literary works. The themes and lessons explored in their studies will aid them in facing their adult responsibilities as productive citizens in a changing world.

**English 4 Thematic: Story: From Print to Film**
*Prerequisites: English I, English II, and English III and permission from the instructor.* Story: From Print to Film is an inter-disciplinary course designed to synthesize the written narrative and digital story-telling. The project-based course is rooted in student experience, both in the classroom and in the field. As an English 4 option, students will design and fulfill the requirements for senior English in an engaging, tech-forward context.

**AP English Literature and Composition**
*Prerequisites: minimum of an 85 average in English III or English III Honors, recommendation of the eleventh grade English teacher, and permission of the English Department Chairperson.* This course includes intensive study of representative works from various genres and periods—from sixteenth to twentieth centuries. Students engage in the careful reading and critical analysis of literature in order to deepen their understanding and appreciation. As they read, students focus on a work's structure, style, and theme as well as the use of figurative language, imagery, symbolism and tone. Writing and vocabulary study are integral parts of the course. Writing and vocabulary study are integral parts of the course. Writing assignments focus on the critical analysis of literature and include expository, analytical, and persuasive essays. Research and creative writing assignments and projects are also parts of the curriculum.

The following English courses count as electives.

**AP English Language and Composition**
*Prerequisites: minimum of an 85 average in English III, English II Honors, or English III Honors, recommendation by the current year English teacher, and permission of the English Department Chairperson.* This course engages students in becoming skilled readers of prose written in a variety of rhetorical contexts, and in becoming skilled writers who compose for a variety of purposes. Both their writing and their reading should make students aware of the interactions among a writer's purposes, audience expectations, and subjects, as well as the way genre conventions and the resources of language contribute to effectiveness in writing. Research and creative writing assignments and projects are also parts of the curriculum.

**ESL**
This course is designed for non-native speakers of English at the intermediate level of English proficiency. ESOL instruction helps students to develop vocabulary, phonemic awareness, reading skills and strategies, writing skills, and to increase listening/speaking proficiency. Students are also given instruction in American popular culture and day-to-day conversational skills.

**AP Seminar**
This foundational course in the AP Capstone experience, typically taken in grade 10 or 11, provides students with opportunities to think critically and creatively, research, explore, pose solutions, develop arguments, collaborate, and communicate using various media. Students explore real-world issues through a cross-curricular lens and consider multiple points of view to develop deep understanding of complex issues as they make connections between these issues and their own lives. Students read articles, research studies, and foundational and philosophical texts; listen to and view speeches, broadcasts, and personal accounts; and experience artistic and literary works to gain a rich appreciation and understanding of issues. Students have the flexibility to choose appropriate themes that allow for deep exploration based on their interests, local and civic issues, global or international topics, and concepts from other AP courses. Sample Topics or Themes include Education, Innovation, Sustainability, Technology, and Revolution
*Assessment:* Students are assessed through two through-course performance tasks and a written exam. The AP Seminar Exam score is based on all three components and is reported on the standard 1– 5 AP scoring scale.

**< see next page for senior seminar offerings >**

**Senior Seminar**
This course designed to help 12th grade students complete college applications, write a resume, search and apply for scholarship opportunities, write a research paper, and create and present a multidisciplinary project, a graduation requirement.

Classroom time will be divided between conventional classrooms and computer labs. In the classrooms, students will be advised about writing techniques, test-taking strategies, and other relevant information needed by college-bound students. In the labs, students are expected to work diligently to complete all components of the course.

All Senior Seminar courses will complete all the college-bound assignments to supports through the entire college process alongside the counseling office. To direct the research portion, three strands have been developed to provide students different options for their senior project.

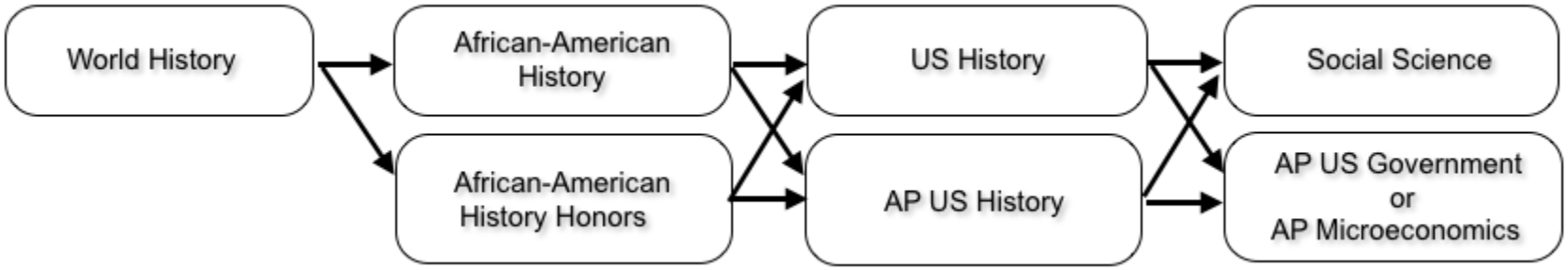
*Open*: This strand is a half credit course and will pair with a gym class for the half credit. It is only available for students who need a half credit in PE to graduate. Students will be provided the option to select their topic without commonality across the classroom. It is designed to be self-directed and students will receive individual support based on their interest. Research papers will emerge based on topic the students would like to explore, given their strengths and career goals.

*Entrepreneurship: Examining the intersection of Innovation and Business* – This full credit strand will offer students the opportunity to create a more actionable senior project that addresses a need in society. It will include a range of guest speakers to provide students different ideas for entrepreneurship and help students refine their ideas. Students will need to be open-minded, creatively identifying strategies to solve problems that impact their local community or larger society. Research papers and presentations will maintain traditional forms as well as incorporate original specifications based on a student's project.

**All seniors are expected to register for a senior seminar course.**

**1. Social Studies**

**Graduation requirements: Students must pass World History, African-American History, either American History of AP United States History, and either Social Science or Advanced Placement US Government and Politics.**




**World History**
World History is a survey course that explores selected key events from ancient times to the present. The scope of World History provides insight across all aspects of the human experience: economics, science, religion, philosophy, politics & law, military conflict, literature & the arts. The course will illuminate connections between our lives and those of our ancestors around the world. Students will refine their ability to read for comprehension and critical analysis; summarize, categorize, compare, and evaluate information; write clearly and convincingly; express facts and opinions orally; and use technology appropriately to present information.

**African American History**
The course begins in Africa in order to orient students to the histories, cultures and experiences out of which Africans emerged and that continue to shape African behavior around the world. Approaching the African experience in the creation, evolution and continuing reconfiguration of the United States requires seeing African life as both extensions of their African experiences and contributions to the multi-national society and culture that is the United States.

**American History**
This course will examine major turning points in American History beginning with the events leading up to the American Revolution, The Civil War, Reform Movements; the changing nature of business and government; World Wars; and the emergence of the United States as a superpower. We will also focus on how the struggle to achieve class, ethnic, racial and gender equality factor into various historical events. Students will analyze world issues such as globalization and economic interdependence as we tie together the themes of conflict and cooperation.

**AP United States History**
United States History, a survey course, will allow students to examine the major political, economic, social, and cultural developments in the United States from the Colonial Period through the 21st century. Throughout this survey of U.S. history, students will examine multiple perspectives on historical events, political ideas, relationships among different socioeconomic, racial, cultural, and religious groups, as well as relations between men and women. It is intended that through this course, students will gain a greater understanding of how the events, individuals, and trends in American history are interrelated and influenced by economic, political, religious, and social forces. Students will be given the opportunity to take part in discussions and debate in order to engage with the past and understand the relevance of American history to today's society.

**Social Science**
The overall purpose of the Social Science course is to give students an understanding of our Government and Economy in action. We want students to see themselves not only as individuals, but productive participants in society. Students will integrate current events and history to form an understanding of how our Government (Federal, State, and Local) operates within the country and between other countries; the roles and responsibilities that American citizens have in the world today; fundamentals of our Constitution; and finally, an understanding of how our economy works and the economic policies that impact our everyday lives.

**AP US Government and Politics**
*Prerequisite: Permission of the instructor.* This course is designed to give students a critical perspective on government and politics in the United States. It involves both the study of general concepts used to interpret American politics and the analysis of specific case studies. It also requires a familiarity with the various institutions, groups, beliefs, and ideas that make up the American political reality. The course will focus on the Constitutional underpinnings of American Government, Political Beliefs and Behavior, Political Parties and Interest Groups, the Institutions and Policy Decisions. In order that students are fully prepared to meet the rigors of college level studies, AP American Government students will be expected to complete a research paper designed to examine and explain some specific aspects of the course. To test students' analytical skills, the course will require the study of primary source materials, as well as the discussion of assigned articles, which are germane to the course.

**AP Microeconomics**
*Prerequisite: Permission of the instructor.* AP Microeconomics is an introductory college-level course that focuses on the principles of economics that apply to the functions of individual economic decision-makers. The course also develops students' familiarity with the operation of product and factor markets, distributions of income, market failure, and the role of government in promoting greater efficiency and equity in the economy. Students learn to use graphs, charts, and data to analyze, describe, and explain economic concepts.

The following Social Studies courses count as an elective.

**AP World History**
The purpose of this course is to gain an in-depth understanding of the world's geographical areas and the cultures contained therein. Course material will focus on the continents of Africa, Asia, and Europe from the dawn of modern humans to the 20$^{th}$ century. Articular attention will be given to the socio-political evolution of cultures on these continents, including (but not limited to) the study of religion, art, social norms, and each group's sense of cultural identity. Students will be expected to juxtapose cultures from around the world, interact with primary sources in an attempt to gain better understanding of foreign cultures, and gain a broader sense of what inter-cultural interaction means.

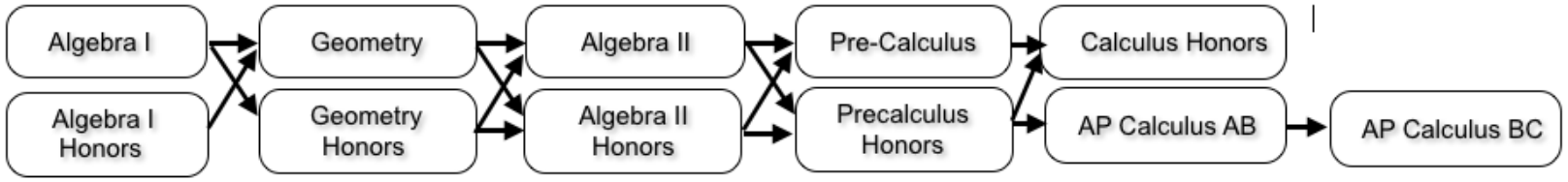
**Law**
The people involved with the first classes selected the name *Street Law* to represent the content of the course-- practical law important in a person's everyday life, on the street. Information is presented through student-centered activities that enable teens to develop the skills they would need to use Street Law's information and to be effective citizens. The evaluation also found that 86 percent of the students who took Street Law classes found them to be more interesting than were their other social studies courses.

**Philosophy**
*Course offered to grade 11 and 12 students only.*
This course will introduce students to the most prominent people, movements, and methods of world philosophy from ancient times to the present. The fundamental problems that philosophers have dealt with, as well as the various approaches and arguments they have used will be examined. Students will use these as a vehicle to improve their own critical thinking skills. Multiple frameworks in this class will be discussed with many ideas running counter to those held as part of a religious belief system. Parents and students who are uncomfortable with this aspect of the class may not want to enroll.

**Community Engagement**
This course is designed to develop students into active participants in their learning and community through direct service, education and reflection opportunities. Students will become leaders in the school community and have the opportunity to plan several community improvement events. The course will feature various guest speakers from local businesses, who will talk openly with the students about the different aspects of volunteerism, planning, organizing, and executing successful events. This course is geared towards students who have a strong desire to network, work with others, and help improve their community. Active participation is a must!

**2. MATHEMATICS**

**Graduation requirements: Algebra I, Geometry, Algebra II, and Precalculus. Students at Carver HSES take a math course every year.**




**Algebra 1**

This is the foundational course of high school mathematics. Topics will include expressions and equations with variables, graphing, real-life application of mathematical principles (word problems), and working with data. This course will prepare students for success on the state-mandated Keystone Algebra Exam, which is now a graduation requirement.

**Algebra 1 Honors**

*Prerequisites: High score on the mathematics placement exam given to incoming freshmen in the summer.* This is the foundational course of high school mathematics. Honors Algebra I will cover the same topics as Algebra 1, but with an accelerated pace and more in-depth applications. Topics will include expressions and equations with variables, graphing, real-life application of mathematical principles (word problems), and working with data. This course will prepare students for success on the state-mandated Keystone Algebra Exam, which is now a graduation requirement.

**Geometry**

*Prerequisites: Successful completion of Algebra I.* Geometry is the study of lines, angles, and shapes in both two and three dimensions. This course includes an introduction to trigonometry.

**Geometry Honors**

*Prerequisites: Successful completion of Algebra I with an A or B and permission of the instructor.* Honors Geometry will cover the same topics as Geometry, but with an accelerated pace and more in-depth applications. Topics will include lines, angles, and shapes in both two and three dimensions. An introduction to trigonometry and completing mathematical proofs is also emphasized in this course.

**(Block) Algebra 1 Honors/Geometry Honors**

*Prerequisites: High score on the mathematics placement exam given to incoming freshmen in the summer and permission of the instructor.* This high-paced course is held in a block period, with the two courses integrated throughout the year. As a result, they may not be taken separately.

**Algebra 2**

*Prerequisites: Successful completion of Algebra 1.* The goal of this course is to develop algebraic skills and to apply these skills to the solution of problems. The topics to be covered include operations and properties of real and complex numbers, solutions of linear and quadratic equations.

**Algebra 2 Honors**

*Prerequisites: Successful completion of Algebra 1 with an A or B and approval by course instructor.* ***Students who did not take Algebra 1 at HSES must take a placement test on February 16.*** Algebra 2 Honors will cover the same topics as Algebra 2, but with an accelerated pace and more in-depth applications. The goal of this course is to develop algebraic skills and to apply these skills to the solution of problems. The topics to be covered include operations and properties of real and complex numbers, solutions of linear and quadratic equations.

**Precalculus**

*Prerequisite: Algebra 2.* The focus of this course is to review algebraic topics and introduce trigonometry in preparation for a college calculus course. Functions such as linear, quadratic, polynomial, and trigonometric are continually stressed throughout the course. An emphasis is placed on test-taking skills and calculator usage.

**Precalculus Honors**

*Prerequisites: Successful completion of Algebra 2 Honors with an A or B and approval by the course instructor.* Precalculus Honors will cover the same topics as Precalculus, but with an accelerated pace and more in-depth applications. This course incorporates the use of graphing calculators for concept development such as inequalities, exponents, logarithms, conic sections, polar coordinates, angles, arcs, and sectors. Functions such as linear, quadratic, polynomial, and trigonometric are continually stressed throughout the course. In addition, problem solving is used to integrate and connect topics.

**(Block) Algebra 2 Honors/Precalculus Honors**
*Prerequisites: Successful completion of Algebra 1 with an A and approval of the instructor. If student has completed Geometry (which is not strictly a prerequisite), that grade must also be an A.* This course is comprised of two half-year block courses. They may not be taken separately. The first semester, Algebra 2 Honors, will focus on adding depth and complexity to algebraic topics covered in Algebra 1. The second semester, Precalculus Honors, will incorporate the use of graphing calculators for concept development such as inequalities, exponents, logarithms, conic sections, polar coordinates, angles, arcs, and sectors. Functions such as linear, quadratic, polynomial, and trigonometric are continually stressed throughout the course. A heavy emphasis will be placed on developing proficiency with trigonometric functions. NOTE: Completion of this course is the only way for students to enter the most rigorous math track at HSES. The terminus of these math courses is AP BC Calculus, which can earn a student up to 8 collegiate credits.

**Calculus Honors**
*Prerequisites: Precalculus or Precalculus Honors.* This course will cover a multi-representational approach to Calculus. Calculus engages students in properties of functions, limit, derivatives, anti-derivatives, integrals, definite integrals and applications.

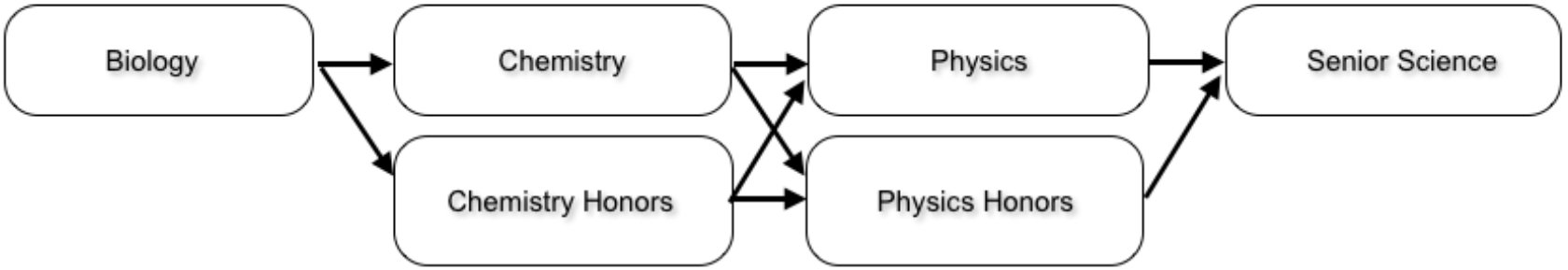
**AP Calculus AB**
*Prerequisites: Successful completion of Precalculus Honors with an A or B and approval by course instructor.* This is a full-year course in the calculus of functions in a single variable. It includes the study of analytical geometry, limits, differentiation, integrations, and applications. It is a college-level mathematics course for which many colleges grant advanced placement credit equivalent to a 1st semester calculus class (approximately 4 college credits.) To earn these credits, students must earn passing marks on the Advanced Placement exam. This course provides a strong background for the students who plan to pursue mathematics or a mathematics-related career and can provided more flexibility of courses at the university level. All students will be required to take the Advanced Placement Calculus AB Examination in May.

**AP Calculus BC**
*Prerequisites: Successful completion of AP Calculus AB with an A or B and approval by course instructor.* This is a full-year course focused on the differential and integral calculus of functions of a single variable. It is a college-level mathematics course for which most colleges grant advanced placement credit equivalent to both 1st and 2nd semester calculus courses (approximately 8 college credits.) To earn these credits, students must earn passing marks on the Advanced Placement exam. This course provides a strong background for the students who plan to pursue mathematics or a mathematics-related career and can provided more flexibility of courses at the university level. All students will be required to take the Advanced Placement Calculus BC Examination in May.

**AP Statistics**
*Prerequisite: A or B in Algebra II or permission of instructor.* 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: (1) Exploring Data: Observing patterns and departures from patterns, (2) Planning a Study: Deciding what and how to measure, (3) Anticipating Patterns: Producing models using probability & simulation, and (4) Statistical Inference: Confirming models. Students are required to take the AP Statistics test in May.

**3. SCIENCE**

**Graduation requirements: Students must pass Biology, Chemistry, Physics, and one other science, computer science, or engineering course. Students at Carver HSES take a science, computer science, or engineering course every year.**




**Environmental Science Survey (0.5 credits)**

Environmental science survey is an introductory level course designed to introduce 9th grade students to environmental science. Environmental Science is the study of the interactions among chemical, physical, and biological components of the environment; with a focus on pollution and degradation of the environment related to human activities; and the impact on biodiversity and sustainability from local and global environments. In addition, this survey course also covers many topics that will be tested on the Biology Keystone exam.

**Biology**

This course focuses on characteristics of living things, chemical composition of living things, how living things use energy, and how living things have evolved over time. Through a mix of lecture and lab, you'll be prepared for the Keystone and the Biology (Molecular) Subject SAT Exam.

**Chemistry**

This course is designed to further your understanding of the atomic nature of matter and how it relates to our macroscopic world. You will explore properties and changes in matter, its classifications, and its interactions. As a general survey course of Chemistry, the concepts covered in this course are varied and include: energy, conversions, measurement, atomic theory, chemical reactions, mass conservation, thermodynamics, bonding, intermolecular forces, solutions, and acid/base. These concepts, among others, will be explored through experiments, inquiry, student collaborations, and multidisciplinary projects.

**Chemistry Honors**

*Pre-requisites: A or B in Algebra I and/or Geometry. Approval of Department Chair required.* This course is designed to further your understanding of the atomic nature of matter and how it relates to our macroscopic world. In addition to the topics and concepts found in the General Chemistry course, Honors Chemistry places an emphasis on more problem solving and mathematical reasoning. Additional topics covered include chemical kinetics and equilibrium. You will explore these topics through experiments, inquiry, student collaborations, multidisciplinary projects, and problem-based learning (PBL) exercises.

**Physics I**

This course studies the physical world on a larger scale than Chemistry, although the governing laws are often applicable to certain small-scale objects as well. This course will focus on motion and its causes, repetitive motions, sound and light, electricity and magnetism.

**Physics I Honors**
*Permission of the Department Chair.* This course studies the physical world at a more rapid pace than the regular Physics 1 course, with frequent laboratory experiments and more challenging applications. The purpose of this course is to prepare students for the material to be seen in their first semester Physics course in college. Students attempting to take this course should have received a B or better in their previous mathematics and science courses.

**Anatomy**
Anatomy will focus on the structure and function of living things. From the molecular level to the organismal level, students will participate in lecture and dissections to master the material. This course is designed to be a prerequisite for Advanced Placement Biology and is also designed to prepare students for careers in the medical field. The prerequisite for Anatomy is to have successfully completed the Introduction to Biology Course.

**Astronomy**
This introductory course will study our universe on a grand scale and look at where we are in it and our limitations at fully understanding it. The course will focus on the discovery of planetary systems existing around distant stars and the determination of habitability elsewhere in the universe. Students will complete a mixture of quarterly individual and group projects to delve into certain central topics to the course.

**Environmental Science**
This course provides an overview of the nature of ecosystems, energy flow, and interrelationships of biology, geology, and chemical cycles. Students explore issues in population studies, environmental pollution, and organization and dynamics of ecological communities. Specific topics include scientific habits of mind; the application of scientific knowledge, methodology, and historical context to solve problems; earth dynamics; the influence of technology on environmental quality; conservation practices; biodiversity; environmental planning and waste management; environmental monitoring and policy; sustainable use of public land; characteristics of populations; biotic and abiotic environmental factors; and energy production technologies.

**Urban Ecology**
This course is designed to be a capstone course aiming for an audience of seniors and juniors that includes lecture, discussion, labs, field studies, community engagement work, and field trips to facilities such as a waste water plant. Emphasis is placed on applying knowledge of environmental principles to neighborhood advocacy in addressing issues such as air pollution, storm water runoff, environmental health hazards, enhancement & protection of the urban tree canopy, mitigating refuse and seeking ways to engage family, neighbors and community at large in adopting a more green lifestyle. Students are encouraged to take away a stronger sense of environmental advocacy and environmental stewardship within the context of an urban environment.

**Introduction to Psychology**
Psychology focuses on individual behavior and why an individual thinks, feels, and reacts to certain stimuli. Major emphases will be placed on research methods, stages of human development, the biology of the brain, altered states of consciousness, senses and perception, and psychological disorders. Through a mix of lecture and classroom activities, students will master psychology content as well as develop a greater awareness of self.

**AP Psychology**
*Prerequisites for AP Psychology are successful (B or better) completion of Introduction to Psychology*. AP Psychology introduces students to the systematic and scientific study of the behavior and mental processes of human beings and other animals. Students learn about the ethics and methods psychologists use in their science and practice. AP Psychology students will take the AP Psychology Exam at the end of the school year to assess course knowledge and potentially receive college credit.. *This course contains has a greater emphasis on the science of psychology than the Introduction to Psychology course.

**AP Chemistry**
*Pre-requisites: Permission of the instructor.* In accordance to College Board standards and guidelines, AP chemistry is designed as the equivalent of a first year college general chemistry course. Throughout the year, you will enhance your problem solving, logic, critical thinking, and communication skills. AP Chemistry will build upon the foundations set forth in Chemistry I and will introduce new concepts including advanced thermodynamics and equilibrium topics, introductory quantum mechanics, chemical reaction rates, and electrochemistry. These concepts will be explored through a focus on mathematics, critical reading, inquiry experiments, student collaboration, and problem based learning (PBL) exercises.

**AP Physics I**
*Prerequisite: Permission of the Department Chair.* This course is the equivalent to a first-semester college course in algebra-based physics. The course covers Newtonian mechanics (including rotational dynamics and angular momentum); work, energy, and power; and mechanical waves and sound. It will also introduce electric circuits. Students attempting to take this course should have received an A in their previous mathematics and science courses.

**AP Environmental Science**
*Prerequisite: Students must have scored at least a B in the Environmental Science Survey Course, Biology, and Chemistry.*
The AP Environmental Science content corresponds to a one-semester length college environmental science course. The course is interdisciplinary in nature and will cover such topics as ecology (biology), the processes involved in the build-up of ground-level ozone (chemistry), the fundamental laws of thermodynamics (physics), and the global effects of the population explosion (social science and economics).

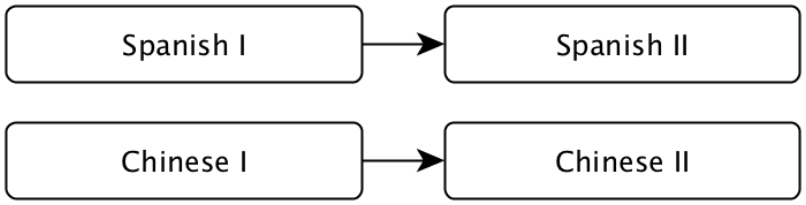
**AP Biology**
*Prerequisite: A in Biology and Anatomy or permission of the instructor.* This course is designed to be the equivalent of the general biology course usually taken during the first college year. It will prepare the students to take the AP Exam in Biology. Students selecting the course should have an overall good standing academically, especially in English, biology and chemistry, and be prepared for the demands of a rigorous course.

**Biotechnology/Science Research**
The Biotechnology aspect of the course focuses on basic lab methods, critical thinking, and communication skills currently used in the biotechnology industry. Students will learn the foundation of the scientific method, basic lab safety and lab documentation while acquiring skills in the maintenance and calibration of basic lab equipment, calculation and preparation of lab solutions, basic bacterial and phage cell growth and sterile techniques. Principles of measurements and separation utilized in the laboratory, including but not limited to, pH measurement, spectrophotometry, centrifugation and electrophoresis will be introduced. In addition, issues related specifically to the biotechnology and medical industries, such as understanding the product development process, public health, environmental health, and ethical, legal and social concerns will be addressed.

The Science Research aspect of the course is intended for students who have a genuine interest in the process and pursuit of science through research. The course will study the role and progression of scientific research in society. The ultimate objective of the course will be to develop and present a scientific research project eligible for submission in local science fairs. In the past few years, HSES students have won merit and monetary awards as well as scholarships for their outstanding work at these competitions.

**4. WORLD LANGUAGE**

**Graduation requirements: Students must complete two years of the same language.**




**Spanish 1**

In this course, students will begin a comprehensive, classic approach to Spanish language learning which focuses on writing, reading, listening, speaking, and the variety of cultural aspects found in the Hispanic world including geography, lifestyles, clothing, sports, music, dance, pop culture, food, theatre, and daily routines. Students will gain a preliminary understanding of basic present- and past-tense grammatical language and vocabulary on the topics of numbers, letters, greetings, school, home, family, sports, food, shopping, clothing, colors, healthcare, commands, and daily routine. Students will also gain a rudimentary understanding of Spanish language pronunciation and be able to carry on short, content-based conversations with classmates and apply them to real-life situations and media such as newspapers, television, movies, and the internet through role-playing, total physical response, and project-based learning.

**Spanish 2**

In this course, students will continue comprehensive Spanish Language learning that was begun in Spanish 1. The beginning of the class will be spent reviewing basic grammatical concepts such as syntax and verb conjugations and pertinent continuing vocabulary from Spanish 1. The content areas will expand to learning both types of past-tense conjugations, future tense, present progressive as well as the vocabulary of summer and winter activities, cultural diversions, vacations, modes of transportation, restaurants, telecommunications, finances and credit, and games. Students will learn to read longer sections of text including short stories and poetry as well as to speak in more open-ended contexts and situations mimicking real life.

**Chinese 1**

Chinese 1 is an introductory level language class. NIhao 1 textbook is used as the major textbook. It is designed for students who have no prior knowledge of the Chinese language. It is suited to middle or high school students. Chinese 1 covers the state academic standards for reading, writing, speaking and listening. The instruction is balanced between the thematic and communicative approach to learning the knowledge and skills that will enable students to improve their second language skills and understand Chinese culture. Chinese characters are used extensively throughout the text and are accompanied by Pinyin, which acts as a pronunciation guide. Pinyin is gradually omitted as students become familiar with the characters and vocabulary. Chinese 1 teaches the pronunciation skills and introduces common characters, simple phrases and sentence patterns that are needed for communicating in basic, practical situations. Grammatical structures are explained clearly and are accompanied by many examples of how to use them correctly. Background information on relevant cultural topics are also included to strengthen students' understanding of the language. Chinese 1 introduces more than 280 words and phrases, and provides 84 characters to learn to write.

**Chinese 2**

*Prerequisites: A student has to pass Chinese 1 in order to proceed to Chinese 2.* Chinese 2 is considered as the elementary level in Chinese language. It is suited to middle or high school students. It covers the state academic standards for reading, writing, speaking and listening. The instruction is balanced between the thematic and communicative approach to learning the knowledge and skills that will enable students to improve their second language skills and understand Chinese culture. Chinese 2 students will expand their Chinese context vocabulary on different topics and deepen their knowledge of Cultural differences and current hot topics in both America and China by exploring *the Pinyin, tones and certain topics based on relevance and cultural importance.* Students are also encouraged to consult materials outside the course, such as Websites; outside agencies, or other media to better understand about the languages and cultures. Chinese 2 has a stronger focus on important sentence structures and the language introduced is more frequently and functionally repeated. The settings and topics are closely related to students' daily lives to make the language meaningful, and the dialogues are spiced with humor to keep students engaged. This level introduces more than 440 words and phrases, and provides 140 characters to learn to write.

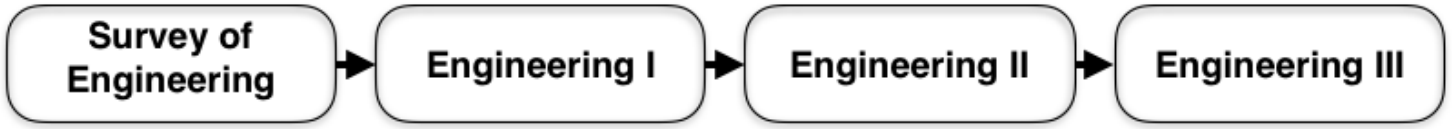
The following courses count as electives.

**Spanish 3 Honors**
In this course, students continue to develop their proficiency in speaking, listening, reading, and writing: interacting with other speakers, understanding oral and written messages, and making oral and written presentations in the target language. Students will communicate on a variety of topics using more complex structures, moving from concrete to more abstract concepts. Students will comprehend the main ideas of authentic materials that they read and hear, and will be able to identify significant details when the topics are familiar. Students should consider taking this class if they are interested in studying Spanish in college, to excel on their college entrance world language placement tests, or to take SAT II subject tests for Spanish.

**Chinese 3 Honors**
*Prerequisites: A student has to pass Chinese 2 in order to proceed to Chinese 3.* Chinese 3 is considered as intermediate level in Chinese language. The Nihao 3 textbook will be used. It is the third level in the series and is designed for students who have completed Chinese 1(Ni Hao 1) and Chinese 2 (Ni Hao 2). It is suited to high school students. Chinese 3 covers the state academic standards for reading, writing, speaking and listening. The instruction is balanced between the thematic and communicative approach to learning the knowledge and skills that will enable students to improve their second language skills and understand Chinese culture. As in the previous Ni Hao levels, Chinese characters are used extensively throughout the text and are accompanied by Pinyin, which is gradually omitted. Chinese 3 teaches students more advanced sentence structures and expands on the vocabulary and language to assist them with holding more in-depth conversations on relevant topics. This level introduces more than 500 words and phrases, and provides 151 characters to learn to write.

**Chinese Culture**
Chinese Culture is considered as an elective course about the history, geography and customs in China. The Chinese Culture texts will be selected from *Chinese History*, *Chinese Geography* and *Chinese Culture* books. It introduces more extensive background knowledge about China and connects with current events happening today in China so that students have better understanding of China as a developing country. It is suited to middle or high school students. This will be a project-based course. Students will incorporate the skills of doing research, writing research paper and sharpen their presentational skills throughout the process.

**6. Engineering**




**Engineering Survey (0.5 Credits)**
Students design and construct prototypes using the engineering design process with common and easily manufactured materials. Communication, teamwork, and creative thinking in the design process will be emphasized. Students will gain an understanding of a variety of engineering fields and the roles of engineers in society. This course is intended to provide inspiration to continue study with the HSES Engineering Technology elective program and extracurricular design competitions.

**Robotics 0.5 credit**
This rostered after-school course prepares students to participate in engineering design competitions including regional, state, and national participation in Technology Student Association, First Tech Challenge, SeaPerch Design Challenge, MESA, Science Olympiad, and Science Fairs.

**Engineering I**

**Introduction to Engineering Design (IED)**
The first course in HSES' Project Lead the Way engineering program (www.pltw.org). This course teaches problem-solving skills using a design development process. Models of product solutions are created, analyzed, and communicated using solid modeling computer design software. Hands-on and computer-generated projects comprise a large part of the curriculum.

**Principles of Engineering (POE)**
*Prerequisite: Introduction to Engineering.* The second course in HSES' Project Lead the Way engineering program (www.pltw.org). This course helps students understand the field of engineering/engineering technology. Exploring various technology systems and manufacturing processes help students learn how engineers and technicians use math, science and technology in an engineering problem solving process to benefit people. The course also includes concerns about social and political consequences of technological change. Hands-on projects and engineering competitions make up a large part of the curriculum.

**Engineering II**

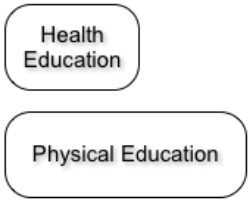
**Digital Electronics (DE)**
*Prerequisite: Introduction to Engineering and Principles of Engineering or permission of the instructor.* This course is based on the principles and laws of traditional electronics and electrical theory. Digital Electronics and embedded micro-computers (a direct application of Digital) are in every product that is either plugged into a wall or operated by batteries, and is therefore a technology that all people are exposed to in their daily lives. Students will begin with a study of basic electrical theory then move on to learn the basic principles and theories of digital circuits. The curricula used in this course was created by Project Lead the Way, Inc.® and it embraces the educational tenets of project based learning. Students develop solutions to solve the problems posed by essential and key questions stated in each Unit and Section overview.

**Civil Engineering & Architecture (CEA)**
*Prerequisite: Introduction to Engineering and Principles of Engineering or permission of the instructor.* The major focus of the Civil Engineering and Architecture (CEA) course is a long term project that involves the development of a local property site. As students learn about various aspects of civil engineering and architecture, they apply what they learn to the design and development of this property. The course provides freedom to the teacher and students to develop the property as a simulation or to students to model the real-world experiences that civil engineers and architects experience when developing property.

**Engineering III -- Engineering Design Capstone**
*Prerequisites: Any two of the following: IED, POE, DE, CEA.*
Knowledge and skills students acquire comes together as they identify an issue and then research, design, and test a solution, ultimately presenting their solution to a panel of professionals they have networked with along the way. Using a design process, students maintain a notebook, write a design proposal and detailed design paper with successful completion satisfying the HSES senior research paper requirement. Students are strongly encouraged and supported for design submission to competitions and engineering science fairs. Students earn a Pennsylvania completion certificate in 'Engineering Technology' Program of Study upon achieving a high score on a national exam offered during the course.

**7. HEALTH AND PHYSICAL EDUCATION**

**Graduation requirements: Students must earn 1.0 credit in Physical Education and 0.5 Credits in Health Education.**




**Physical Education**
Students will be instructed on and practice a variety of kinesthetic movements in relation to physical fitness, sports, muscular endurance, muscular strength, cardiovascular endurance, flexibility, team work, offensive and defensive strategies, and body composition. Students will practice activities that promote lifelong fitness and physical well-being.

**Kinesiology**
This class is designed to enhance the performance of the student-athlete. Students will focus on agilities, weight-training, cardio-vascular improvement, sports specific training, advanced offensive/defensive strategies for team sports, speed enhancement, and training development. Students will also be instructed in the classroom on nutrition, sports related anatomy, performance enhancing drugs, and other major topics in the athletic field. The course will require both classroom written work and performance based evaluation in the gymnasium/weight room.

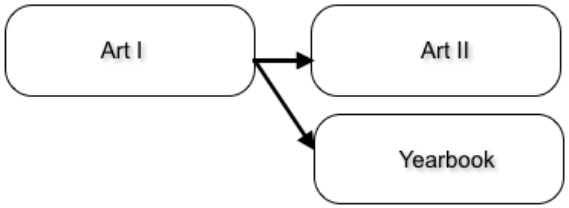
**Health Education** *(.5 Credits)*
This course will cover the various components of healthy living. Our goal will be to allow students to develop the necessary skills in decision making that will enable them to live their lives to their full potential.

**Intro to Dance**
Intro to Dance provides a dance overview for students who are interested in building a foundation of various dance techniques and styles. Students become acquainted with basic technique in Ballet, Modern, Jazz, and Tap, as well as anatomical awareness that is pervasive throughout their lives. Gaining movement skills and finding confidence and enjoyment through movement are also a focus of this class. No previous dance experience necessary.

**Dance 2 (Prerequisite, Dance 1);**
Students enrolled in Dance 2 will focus on a greater depth of knowledge related to the foundational genres of dance. This course will serve as an extension of Dance 1 and explore more advanced movements as well as in depth choreography in Ballet, Tap, Jazz, and Modern dance styles. This course will aim to develop professional approaches to rehearsals, performances, and choreography.

**8. Arts & Humanities**

**Graduation Requirements: You must have 2.0 credits in Arts & Humanities.**

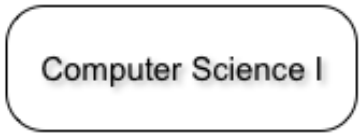



**Foundations (1 credit-1/2 year block)**
This course will give its students a foundation in the practices and principals of art. Students will learn methods and styles of drawing skills, mix media, color theory, 3-D art design, watercolor painting and printmaking. Students will also learn to look at art, write about art and how to speak as an artist. Students will walk out with a real understanding of the world of an artist.

**Graphic Arts (1 credit- full year)**
Looking to the world of professional graphics, students will discuss and create imagery that is used in everyday graphic design. Students will use the golden rules of advertising to create product designs for local and national businesses. Students will study the history of advertising and discuss the possibilities of its future. Images will be created both by hand and by computer. Programs used: Adobe CS3: Illustrator, Photoshop, and InDesign, along with film and sound editing.

**Yearbook (1 credit)**
*Prerequisite: Must be a senior.* This course is dedicated to the development of the yearbook and yearbook video. Students will learn techniques to design, photograph, videotape and edit an award quality yearbook for the senior class. The class will be responsible for developing the theme and keeping the senior class informed of the needs of their book. Programs Used: Adobe Photoshop, Adobe Illustrator, Adobe InDesign, along with film and sound editing.

**9. Computer Science**




**Computer Science I**
Computer Science One will introduce Computer Science through the use of computer applications and computer programming. Students will use a variety of variety of programming languages and interfaces to code. They will discover problem solving and program design using structured, top-down, algorithmic development techniques. The course also introduces students to some of the more practical features of Microsoft Office. Students experience hands-on instruction in word processing, spreadsheets, databases, and professional presentations. The course also introduces advanced applications using Adobe CS suite. Students will learn advanced graphic manipulation using Photoshop and Illustrator. They will create comprehensive web-sites using Dreamweaver and Fireworks. And students will create digital movies using iMovie and iStop Motion. This introductory course will serve as a springboard to give students opportunities to choose Advanced Programming classes and/or Digital Design classes.

**Honors Java**
*Prerequisites: Successful completion of a programming course & permission from Computer Science Chair.* Topics will include program design, program implementation, program analysis, standard data structures, standard algorithms, and an overview of computer systems (hardware). Various integrated development environments will be used.

**Advanced Digital Editing**
Advanced Digital Editing is a hands-on multimedia course that focuses on image, audio, and video editing using industry standard software. Students start the course learning advanced techniques of Adobe Photoshop. After mastering image-editing techniques, students are taught fundamentals of shooting and editing digital video and audio.

**Web Development**
Students develop software solutions by building web applications. Students will learn fundamental web programming technologies including HTML5, CSS, tables, and the DOM. In addition, students will use a variety of programming technologies such as back-end SQL databases, PHP and JavaScript to create rich interactive user experiences for both desktop and mobile devices.

**Game Design and Development**
*Prerequisites: Honors Java or Web Development & permission from Computer Science Department.*
This course will cover the basics of game design and development. The process of creating a game (of any kind) is a long and involved process, some games taking over a decade to fully complete. Instead of focusing on one type of game and spending the entire year trying to get as far with the development as possible, we will focus on making a variety of smaller games, giving us a chance to apply game design theory in many different contexts. In this course we will design and develop a board/card game, a platformer, an RPG, a side-scroller, and a 3D first/third person adventure game. In order to ground and guide your development work, the course will also have weekly lectures and discussions focusing on questions such as "What is a game?", "Why do we play games?", "What makes a good game?", "What makes a bad game?", etc. as well as the history of games and video games. This course will be both reading and writing intensive. The readings will consist mostly of articles about different aspects of game design as well as current events in gaming. The writings will mostly be personal reflections on your thoughts on games, how you think your projects are going, and what difficulties you are having with your projects. PARTS OF THIS COURSE WILL ALSO REQUIRE SOME INTERMEDIATE/ADVANCED CODING.

**AP Computer Science A**
*Prerequisites: Successful completion of Honors Java or permission of the instructor.* Advanced Placement Computer Science A is designed to provide students with a rigorous introduction to computer science at a college level, and to prepare students fully for the Advanced Placement Computer Science A Examination. The course emphasizes object-oriented programming methodology with a concentration on problem solving and algorithm development. It also includes the study of data structures, design, and abstraction. Programming assignments in the course are in the Java programming language, with some advanced data structures work in Python.

**AP Computer Science Principles**
*Prerequisite: Permission of the instructor.*
AP Computer Science Principles introduces students to the foundations of computer science with a focus on how computing powers the world. Along with the fundamentals of computing, students will learn to analyze data, create technology that has a practical impact, and gain a broader understanding of how computer science impacts people and society.

**Appendix -- Advanced Placement Credit Requirement & Offerings**

**ELIGIBILITY TO RECEIVE AP CREDIT**
**AP courses are awarded a 1.2 multiplier for the GPA. Students who fail to earn a 2 or higher on the AP Exam in May will lose the AP designation on the transcript and will receive an honors (1.15) multiplier instead.**

**AP English Literature and Composition**
*Prerequisites: minimum of an 85 average in English III or English III Honors, recommendation of the eleventh grade English teacher, and permission of the English Department Chairperson.* This course includes intensive study of representative works from various genres and periods—from sixteenth to twentieth centuries. Students engage in the careful reading and critical analysis of literature in order to deepen their understanding and appreciation. As they read, students focus on a work's structure, style, and theme as well as the use of figurative language, imagery, symbolism and tone. Writing and vocabulary study are integral parts of the course. Writing and vocabulary study are integral parts of the course. Writing assignments focus on the critical analysis of literature and include expository, analytical, and persuasive essays. Research and creative writing assignments and projects are also parts of the curriculum.

**AP English Language and Composition**
*Prerequisites: minimum of an 85 average in English III, English II Honors, or English III Honors, recommendation by the current year English teacher, and permission of the English Department Chairperson.* This course engages students in becoming skilled readers of prose written in a variety of rhetorical contexts, and in becoming skilled writers who compose for a variety of purposes. Both their writing and their reading should make students aware of the interactions among a writer's purposes, audience expectations, and subjects, as well as the way genre conventions and the resources of language contribute to effectiveness in writing. Research and creative writing assignments and projects are also parts of the curriculum.

**AP Seminar**
This foundational course in the AP Capstone experience, typically taken in grade 10 or 11, provides students with opportunities to think critically and creatively, research, explore, pose solutions, develop arguments, collaborate, and communicate using various media. Students explore real-world issues through a cross-curricular lens and consider multiple points of view to develop deep understanding of complex issues as they make connections between these issues and their own lives. Students read articles, research studies, and foundational and philosophical texts; listen to and view speeches, broadcasts, and personal accounts; and experience artistic and literary works to gain a rich appreciation and understanding of issues. Students have the flexibility to choose appropriate themes that allow for deep exploration based on their interests, local and civic issues, global or international topics, and concepts from other AP courses. Sample Topics or Themes include Education, Innovation, Sustainability, Technology, and Revolution
*Assessment:* Students are assessed through two through-course performance tasks and a written exam. The AP Seminar Exam score is based on all three components and is reported on the standard 1– 5 AP scoring scale.

**AP United States History**
United States History, a survey course, will allow students to examine the major political, economic, social, and cultural developments in the United States from the Colonial Period through the 21st century. Throughout this survey of U.S. history, students will examine multiple perspectives on historical events, political ideas, relationships among different socioeconomic, racial, cultural, and religious groups, as well as relations between men and women. It is intended that through this course, students will gain a greater understanding of how the events, individuals, and trends in American history are interrelated and influenced by economic, political, religious, and social forces. Students will be given the opportunity to take part in discussions and debate in order to engage with the past and understand the relevance of American history to today's society.

**AP Microeconomics**
*Prerequisite: Permission of the instructor.* AP Microeconomics is an introductory college-level course that focuses on the principles of economics that apply to the functions of individual economic decision-makers. The course also develops students' familiarity with the operation of product and factor markets, distributions of income, market failure, and the role of government in promoting greater efficiency and equity in the economy. Students learn to use graphs, charts, and data to analyze, describe, and explain economic concepts.

**AP US Government and Politics**
*Prerequisite: Permission of the instructor.* This course is designed to give students a critical perspective on government and politics in the United States. It involves both the study of general concepts used to interpret American politics and the analysis of specific case studies. It also requires a familiarity with the various institutions, groups, beliefs, and ideas that make up the American political reality. The course will focus on the Constitutional underpinnings of American Government, Political Beliefs and Behavior, Political Parties and Interest Groups, the Institutions and Policy Decisions. In order that students are fully prepared to meet the rigors of college level studies, AP American Government students will be expected to complete a research paper designed to examine and explain some specific aspects of the course. To test students' analytical skills, the course will require the study of primary source materials, as well as the discussion of assigned articles, which are germane to the course.

**AP Calculus AB**
*Prerequisites: Successful completion of Pre-calculus Honors with an A or B and approval by course instructor.* This is a full-year course in the calculus of functions in a single variable. It includes the study of analytical geometry, limits, differentiation, integrations, and applications. It is a college-level mathematics course for which many colleges grant advanced placement credit equivalent to a 1st semester calculus class (approximately 4 college credits.) To earn these credits, students must earn passing marks on the Advanced Placement exam. This course provides a strong background for the students who plan to pursue mathematics or a mathematics-related career and can provided more flexibility of courses at the university level. All students will be required to take the Advanced Placement Calculus AB Examination in May.

**AP Calculus BC**
*Prerequisites: Successful completion of AP Calculus AB with an A or B and approval by course instructor.* This is a full-year course focused on the differential and integral calculus of functions of a single variable. It is a college-level mathematics course for which most colleges grant advanced placement credit equivalent to both 1st and 2nd semester calculus courses (approximately 8 college credits.) To earn these credits, students must earn passing marks on the Advanced Placement exam. This course provides a strong background for the students who plan to pursue mathematics or a mathematics-related career and can provided more flexibility of courses at the university level. All students will be required to take the Advanced Placement Calculus BC Examination in May.

**AP Statistics**
*Prerequisite: A or B in Algebra II or permission of instructor.* 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: (1) Exploring Data: Observing patterns and departures from patterns, (2) Planning a Study: Deciding what and how to measure, (3) Anticipating Patterns: Producing models using probability & simulation, and (4) Statistical Inference: Confirming models. Students are required to take the AP Statistics test in May.

**AP Psychology**
*Prerequisites for AP Psychology are successful (B or better) completion of Introduction to Psychology*. AP Psychology introduces students to the systematic and scientific study of the behavior and mental processes of human beings and other animals. Students learn about the ethics and methods psychologists use in their science and practice. AP Psychology students will take the AP Psychology Exam at the end of the school year to assess course knowledge and potentially receive college credit.. *This course contains has a greater emphasis on the science of psychology than the Introduction to Psychology course.

**AP Chemistry**
*Pre-requisites: A or B in Chemistry or Honors Chemistry. A or B in Geometry and/or Algebra II (recommended). . Approval of Department Chair required.* In accordance to College Board standards and guidelines, AP chemistry is designed as the equivalent of a first year college general chemistry course. Throughout the year, you will enhance your problem solving, logic, critical thinking, and communication skills. AP Chemistry will build upon the foundations set forth in Chemistry I and will introduce new concepts including advanced thermodynamics and equilibrium topics, introductory quantum mechanics, chemical reaction rates, and electrochemistry. These concepts will be explored through a focus on mathematics, critical reading, inquiry experiments, student collaboration, and problem based learning (PBL) exercises.

**AP Physics I**
*Prerequisite: Permission of the Department Chair.* This course is the equivalent to a first-semester college course in algebra-based physics. The course covers Newtonian mechanics (including rotational dynamics and angular momentum); work, energy, and power; and mechanical waves and sound. It will also introduce electric circuits. Students attempting to take this course should have received an A in their previous mathematics and science courses.

**AP Environmental Science**
*Prerequisite: Students must have scored at least a B in the Environmental Science Survey Course, Biology, and Chemistry.*
The AP Environmental Science content corresponds to a one-semester length college environmental science course. The course is interdisciplinary in nature and will cover such topics as ecology (biology), the processes involved in the build-up of ground-level ozone (chemistry), the fundamental laws of thermodynamics (physics), and the global effects of the population explosion (social science and economics).

**AP Biology**
*Prerequisite: A in Biology and Anatomy or permission of the instructor.* This course is designed to be the equivalent of the general biology course usually taken during the first college year. It will prepare the students to take the AP Exam in Biology. Students selecting the course should have an overall good standing academically, especially in English, biology and chemistry, and be prepared for the demands of a rigorous course.

**AP Computer Science A**
*Prerequisites: Successful completion of Honors Java or permission of the instructor.* Advanced Placement Computer Science A is designed to provide students with a rigorous introduction to computer science at a college level, and to prepare students fully for the Advanced Placement Computer Science A Examination. The course emphasizes object-oriented programming methodology with a concentration on problem solving and algorithm development. It also includes the study of data structures, design, and abstraction. Programming assignments in the course are in the Java programming language, with some advanced data structures work in Python.

**AP Computer Science Principles**
*Prerequisite: Permission of the instructor.*
AP Computer Science Principles introduces students to the foundations of computer science with a focus on how computing powers the world. Along with the fundamentals of computing, students will learn to analyze data, create technology that has a practical impact, and gain a broader understanding of how computer science impacts people and society.

**APPENDIX -- PATHWAYS**

| Pathway | Required Courses | Recommended Related Courses |
|---|---|---|
| Bio-Medical | • Anatomy<br>• AP Biology<br>• Biotechnology | • Science Research<br>• Advanced PE<br>• AP Statistics<br>• AP Chemistry |
| Computer Science | • Computer Science I<br>• Honors Java<br>• AP Computer Science A<br>• AP CS Principles | • Robotics<br>• Web Development<br>• Game Design<br>• Digital Electronics |
| Engineering | • Engineering Survey<br>• Introduction to Engineering Design<br>• Principles of Engineering<br>• Digital Electronics<br>• Civil Engineering and Architecture<br>• Engineering Capstone | • Calculus<br>• AP Physics<br>• Robotics<br>• Honors Java<br>• AP Computer Science w/Discrete Mathematics |
| Environmental Science | • Environmental Science Survey<br>• Environmental Science<br>• Urban Ecology<br>• AP Environmental Science | • AP Statistics<br>• AP Biology |
| Psychology | • Psychology<br>• AP Psychology | • AP Statistics<br>• Science Research |

**APPENDIX – DUAL ENROLLMENT/OUTSIDE INTERNSHIP PROVISO**

Students electing to take dual enrollment or electing to have an outside internship have classes at a location other than HSES. As a result of staffing and supervision issues, students may not remain at HSES when the off-site classes are not in session. For example, students who have classes at CCP on Monday, Wednesdays, and Fridays and leave HSES at 1PM must also leave HSES at 1 PM on Tuesdays and Thursdays. Families need to take this into consideration when electing these options.