

DELONE CATHOLIC HIGH SCHOOL

2018-19

# COURSE CATALOG

GRADES 9-12

## ADMINISTRATION

Mr. Richard La Rocca, Principal

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# VIRTUAL HIGH SCHOOL

Delone Catholic High School is proud to offer a selection of courses in different disciplines through our partnership with Virtual High School. These courses can be a fruitful supplement to a student's coursework. Credit within an academic discipline will only be offered for courses that are at the "AP" level. All other courses taken through VHS will be granted only an elective credit. DCHS pays for the fees associated with these courses, unless a student fails or withdraws, in which case the parents of that student are responsible for all costs associated with the course. These courses are only for the highly motivated and capable student. Approval to take any VHS course must be granted by the DCHS department chair.

## SCIENCE

15 Weeks	Environmental Science - Honors	Grades 11, 12
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Prerequisites:

1. Biology I, Chemistry I

Every day, millions of human and natural activities are altering the planet on which we live. Environmental Science provides an opportunity to develop a broad understanding of the environmental challenges that humanity is facing today and our need to develop a sustainable relationship with our planet and its resources. This course focuses on the application of biological, chemical, and physical principles to the study of contemporary environmental issues such as air and water pollution, global climate change, hazardous and solid waste, alternative energy resources, soils, deforestation, biodiversity, and endangered species. Using a combination of traditional hands-on laboratory exercises, modern web-based animations and simulations, and an independent research project, this course offers a core laboratory experience that complements the classroom portion through firsthand observations of scientific principles.

35 Weeks	AP® Environmental Science	Grades 11, 12
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Prerequisites:

1. Biology I, Chemistry I

Special Requirements: Students will need access to both a scanner and a digital camera to complete assignments for this course. The scanner is needed only occasionally, but the digital camera will be used every couple of weeks. Please note: This course has a lab fee and an AP Fee. Upon enrollment students are required to print, read and have a parent or guardian sign the Lab Materials Use Agreement. Additional Requirements This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3. There is a \$75/year fee for each enrollment in a VHS AP® course. The kit allows stu-

dents to perform modified versions of several AP® Environmental Science labs suggested by the College Board. Students will need to care for kit contents responsibly, follow directions carefully and work independently to successfully complete these labs. The lab kit price of \$175 is for courses running on a standard VHS schedule.

**Course Description:** This full year AP® Environmental Science class is equivalent to an introductory, one semester, college level, environmental science class. If you have successfully completed both high school level biology and chemistry, if you are interested in the environment, and if you are looking for a challenge, this course might be for you! Because this is a college level course, be ready to commit time to your study. This course will cover concepts in ecology, geology, sociology, economics, biology, and chemistry, that will further your understanding of how humans can live in a sustainable way. Integrated in the course is a field study component which will improve your observational skills, allow you to develop and conduct well-designed experiments, and provide opportunity to interpret and share your observations, results and conclusions with your classmates. You will be applying concepts learned in the weekly lessons to your local field study, as well as collaborating with your classmates regularly on case studies and local environmental concerns to gain a global perspective on environmental issues. During the second semester you will engage in an independent research project which culminates in a project showcase where you will present your research to your classmates. Students enrolled in Advanced Placement VHS courses are required to take the AP exam, and to report their AP exam scores to VHS. By enrolling in an AP VHS class, the student authorizes their school administration to report AP exam scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.

15 Weeks	Astronomy Principles - Honors	Grades 11, 12
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Prerequisites:

1. Completion or concurrent enrollment in Algebra II.
2. Physics is recommended, but not required.
3. Only available when Delone Catholic is not offering Earth Science

Additional Requirements: Materials for labs

**Course Description:** This course is an introduction to astronomy. Student will learn how to observe the sky we see and how it appears to change over time. Then they will learn more about the planets of our solar system and the structure and life of stars. Lastly students will study the Milky Way galaxy as well as those beyond and end by looking to the future. Students will be evaluated on weekly contributions to: discussions; reading assignments; regular, outside, nighttime observation assignments in their Sky Watch journal; and other activities and assignments. Activities will involve hands-on and virtual labs, web inquiries, and using planetarium software. There will be a midterm and final project.

15 Weeks	<b>Environmental Science - Academic</b>	Grades 11, 12
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Prerequisites:

1. Algebra II Academics
2. Only available when Delone Catholic is not offering Earth Science

Additional Requirements: digital camera and assorted materials for labs

Course Description: Every day, millions of human and natural activities are altering the planet on which we live. Environmental Science provides an opportunity to develop a broad understanding of the environmental challenges that humanity is facing today and our need to develop a sustainable relationship with our planet and its resources. This course focuses on the application of biological, chemical, and physical principles to the study of contemporary environmental issues such as air and water pollution, global climate change, hazardous and solid waste, alternative energy resources, soils, deforestation, biodiversity, and endangered species. Using a combination of traditional hands-on laboratory exercises, modern web-based animations and simulations, and service learning opportunity, this course offers a core laboratory experience that complements the classroom portion through firsthand observations of environmental principles.

15 Weeks	<b>Meteorology - Academic</b>	Grades 11, 12
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Prerequisites:

1. Algebra II - Academic
2. Only available when Delone Catholic is not offering Earth Science

Course Description: Earth's weather and climates have influenced and continues to influence daily human events as well as human history. We are inundated daily with accounts of weather, both good and bad. Our daily activities depend, a great deal, on the weather. Weather phenomenon, such as hurricanes, floods and tornadoes have caused loss of life and damage of property. Loss of food crops has resulted from drought or extremes of temperature. We cannot fly a plane, have soldiers jump out of planes, or, for that matter, fight a war without consulting meteorologists to see what the weather is supposed to be on any given day. The Persian Gulf War and the Iraq War were planned according to the weather. The weather helped bring Allied victory on the Russian front during World War II. This class is designed to introduce you to the basic factors of weather/meteorology and to engage your natural curiosity in it. I hope you will find this course interesting as well as challenging. This class was designed around the Internet like our daily activities are designed around the weather. Simple meteorological observations are interwoven with online based assignments, mapping activities, data gathering and graphing activities, and writing assignments to introduce students to the many facets of weather. We will address questions such as: What is climate change? What might be causing it? How does location affect temperature and precipitation? What causes thunderstorms? Why do most weather systems move from west to east in the United States? Join us to find out the answers to these and many other questions related to weather.

15 Weeks	Climate Science - Honors	Grades 11, 12
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Prerequisites:

1. Physical Science and/or Chemistry I
2. Only available when Delone Catholic is not offering Earth Science

Course Description: Current and future generations will be forced to deal with the consequences of our Earth's changing climate. Understanding how life on Earth has been shaped by, depends on and affects climate, is essential for making scientifically informed and socially responsible decisions about our future. Focusing on real-world case studies, this honors level course encourages students to question the cause and effects of climate in the world around them and then explore the science associated behind those questions. This class focuses student learning on better understanding Earth as a dynamic system and then challenges students to evaluate how certain factors are connected to and ultimately impact this system. The course curriculum is anchored in the scientific investigation of Earth's energy budget, carbon chemistry, paleoclimatology and climate data sources. Through this science, students have the opportunity to interpret current research and evaluate the latest news and then work together to investigate decision-making processes around public policy that will impact their future. A major project in this course allows each student to research and evaluate a specific climate change impact story of their choice. Across both terms, course assignments guide students to develop a comprehensive climate report that ultimately can be shared publicly. Students are given the opportunity to demonstrate their expertise and advocate for those in their report via public policy proposal as they participate in a climate congress at the end of the course. Students will take away from the course newfound knowledge and confidence that will allow them to communicate about climate issues in meaningful ways.

35 Weeks	Earth and Space Systems Science - Academic	Grades 11, 12
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Prerequisite:

1. Only available when Delone Catholic is not offering Earth Science

Additional Requirements: This course has a \$150 lab kit fee. Upon enrollment students are required to print, read and have a parent or guardian sign the Lab Materials Use Agreement. Students will use Google Earth, Image (requires Java), GIS (Geographic Information System) and Stellarium to collect and analyze data throughout the course. Students will also need a digital camera to document hands on work throughout the course.

Course Description: Starting from the farthest reaches of space and time, and journeying toward Earth, students will investigate Earth and space science, develop a deep appreciation of Earth as a system, and then consider human impact on this system. The course is organized into three week, theme-based modules that explore Earth's place in the universe and solar system, examine the five spheres of the Earth (atmosphere, hydrosphere, geosphere, cryosphere, and biosphere), and consider the impact of human activity on Earth. Students engage in a series of inquiry-based and

investigative activities designed to have them become participants in Earth science instead of passive observers. As they learn Earth science, they incorporate the same methods that scientists employ in their work, and use the same technology tools scientists use to “do science”. In place of a textbook, this course incorporates a variety of multimedia resources. Students will perform hands-on and virtual investigations to develop a deeper understanding of earth science, incorporating the same online data sets and rich technology tools that scientists use. Students will engage in collaborative activities to generate and evaluate class data, and discuss observations, trends and questions. In each module, students complete a “Challenge,” a summative performance assessment project where they have the opportunity to demonstrate how to apply the knowledge they have acquired in a variety of ways.

15 Weeks	Oceanography - Honors	Grades 11, 12
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Prerequisites:

1. It is strongly recommended that students have a working knowledge of basic Algebra, Geometry and Trigonometry. Chemistry I
2. Only available when Delone Catholic is not offering Earth Science

Additional Requirements: Students will be expected to provide “kitchen science equipment” such as a clear plastic container, food coloring, aluminum foil, paper towels, etc.

Course Description: “There are no passengers on Spaceship Earth. We are all crew.” Marshall McLuhan. Students will board the USS Cyber, a virtual oceanographic research vessel modeled after the flagship of NOAA’s fleet for a sail that begins in Woods Hole, Massachusetts, and ends in San Diego, California. As the crew of the ship, students will perform scientific experiments and collect data that will teach them about the geology, chemistry, and physics of the ocean. From the Bay of Fundy in Nova Scotia to the Caribbean and Antarctica, from the coral reefs to the hydrothermal vent communities deep in the ocean, students will make observations about the sea’s ecosystems and the sometimes unexpected life within them. There are no traditional tests. Students are expected to participate fully as members of the expedition. If you have ever wondered what it might be like to go to sea, pack your bags, and join us. This is a survey course covering the basics of physical oceanography and marine biology presented in a fun and engaging format. There are no traditional tests. Students will be graded on their weekly assignments, which will include both individual and group projects. In lieu of a midterm or final exam, students will be expected to complete a major individual project each term. There will be a strong multimedia component to the course, and students will have the opportunity to choose from reading assignments that meet their comfort level.

15 Weeks	Animal Behavior and Zoology - Honors	Grades 11, 12
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Prerequisites:

1. Biology I-Academic, Chemistry I

Course Description: This course explores the tremendous diversity of animal life and the interconnectedness of different animal species with each other and with humans. The first part of the course explores the classification and characteristics of all the animal phyla, with an emphasis on the evolution of animals and the adaptations that have allowed such diversity to flourish. The second part of the course focuses on many different animal behaviors (including human behavior). Students learn about different types of behaviors – from innate (genetic) behaviors to learned behaviors. The social interactions between animals will be covered in depth as we study courtship, aggression, altruism, and parental behaviors in animals. Students also discuss different careers in the animal sciences as a culminating activity, which should be of great interest to students who wish to pursue their love of animals as their professions. The course will utilize a number of interesting articles, discussions, virtual field trips, activities, videos, and projects to give a wider perspective of the animal kingdom and animal behavior.

15 Weeks	Biochemistry - Honors	Grades 11, 12
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Prerequisites:

1. Biology I and Chemistry I

Additional Requirements: Java is required for students to complete Molecular Workbench activities to visualize and manipulate molecules. You will also need access to a digital camera/scanner.

Course Description: Biochemistry explores the structure and role of essential biological molecules focusing on carbohydrate, lipid, nucleic acid and protein chemistry. Biochemistry is a survey course designed to review general principles of chemistry and biochemistry while relating them back to the physiological conditions of an organism, understanding the chemical and molecular events involved in biological processes. Topics designed in this course include the structure and function of biomolecules, relationship of biochemistry to the physiology of an organism, relationship of bioenergetics to the physiological state of an organism, description of the chemistry underlying metabolic reactions, regulation of metabolic pathways, nutrition and metabolism, enzyme structure and catalysis, DNA, RNA and protein synthesis, and the role of DNA in inheritance. This course provides the linkage between the inanimate world of chemistry and the living world of biology.



15 Weeks	<b>Biotechnology - Academic</b>	Grades 11, 12
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Prerequisite:

1. Introductory high school biology

Additional Requirements: DNA Software download (free)

Course Description: Nearly every day there is amazing news about biotechnology and genetic engineering. This is an exciting, dynamic area that includes many applications that we hear about often – cloning, stem cells, genetically engineered plants and animals, DNA fingerprinting and forensics, gene therapy, and the Human Genome Project. This course is intended to provide you with an overview of biotechnology, starting with a review of DNA structure and function and extending to the current research ongoing in the field. Biotechnology is a course designed to familiarize you with these current innovative technologies based on our use of the DNA molecule. You will examine the opportunities and challenges that these abilities have created for us all. You will look at the techniques that are used in biotechnology and will also see just what kind of work modern biotech companies are involved in. In this class, we will be looking at how scientists use or plan to use DNA in all sorts of fascinating ways. We have all heard of DNA fingerprinting, but there are many, many other ways in which DNA is being used these days, and that's what we'll be looking at in this course, from DNA vaccines to cell therapy to genetically engineered corn.

15 Weeks	<b>Genes and Disease - Honors</b>	Grades 11, 12
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Prerequisite:

1. Biology I-Academic

Course Description: Buried in the cells of each newborn is a unique set of genetic instructions. These molecular blueprints not only shape how the child will grow and develop and whether it will have brown eyes or blue, but what sorts of medical problems it might encounter. Errors in our genes, our genetic material, are responsible for an estimated 3,000-4,000 hereditary diseases, including Huntington disease, cystic fibrosis, and Duchenne muscular dystrophy. What's more, altered genes are now known to play a part in cancer, heart disease, diabetes and many other common diseases. Genetic flaws increase a person's risk of developing these more common and complex disorders. The diseases themselves stem from interactions of genetic predispositions and environmental factors, including diet and lifestyle. This course will focus on four genetic areas, (1) classical or Mendelian genetics, diseases where major effects are from a single gene, (2) multifactorial inheritance, continuous traits and discontinuous traits where several genes plus environmental factors are involved, (3) cytogenetics, diseases involving chromosomal abnormalities, and (4) mathematical genetics, including population genetics, linkage, and mapping.

15 Weeks	Pre-veterinary Medicine - Honors	Grades 10, 11, 12
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Prerequisites:

1. Biology I and Chemistry I

Course Description: Are you interested in becoming a veterinarian or a veterinary technician? Do you love animals and wish to learn more about them? Pre-veterinary Medicine will introduce you to basic vertebrate anatomy by covering the major systems of the body including the digestive, reproductive, skeletal, cardiovascular, respiratory, excretory, and integumentary systems. We will use examples from small animal medicine (dogs and cats although some large animal anatomy will be covered) and discuss medical problems that are commonly seen in veterinary offices. Every week we will have a "Dilemma of the Week" where students will examine and discuss common ethical dilemmas that veterinarians face on a regular basis. Following the introduction to anatomy and physiology, you will learn the diagnostic procedures that assist veterinarians in making appropriate diagnoses. You will learn how to take a medical history, perform a basic physical examination, and what types of tests (blood, X-ray, fecals) that vets employ to get a better picture of the animal's health. For the remainder of the course, you will work in small groups on case studies. You will follow cases from start to completion, brainstorming about potential causes of ailments, diagnoses and treatment options.

35 Weeks	AP® Biology	Grades 11, 12
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Prerequisites:

1. Biology I and Chemistry I

Additional Requirements: This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3. There is a \$75/year fee for each enrollment in a VHS AP® course. There is also a lab kit for this course that must be purchased for an additional fee of \$200. The kit allows students to perform modified versions of several AP® Biology labs suggested by the College Board. Students will need to care for kit contents responsibly, follow directions carefully and work independently to successfully complete these labs.

Course Description: The Advanced Placement course in Biology is equivalent to a full-year Freshman Biology course taught at any major University. Students will be reading the same text that is used at many major colleges and universities, and working at a rigorous pace to cover the material and prepare for the Advanced Placement Examination in May. Upon successful completion of the exam, students may receive college credit and will be well-prepared for any future Biology course. This class will build upon prior knowledge of Biology. The course covers topics such as molecular genetics, biochemistry, human anatomy and physiology, cell biology, plant biology and ecology. Using the text, the Internet, class discussions, and projects,

the course will cover a tremendous amount of material in order to give students a complete understanding of the study of biology. Biweekly examinations will test students' knowledge of the material as well as prepare them for the AP® examination. Due to the volume and level of the material, this course is designed to challenge extremely motivated students who have a strong interest in the Biological Sciences. Students enrolled in Advanced Placement VHS courses are required to take the AP® exam, and to report their AP® exam scores to VHS. By enrolling in an AP® VHS class, the student authorizes their school administration to report AP exam scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3.

15 Weeks	Epidemics - Academic	Grades 11, 12
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Prerequisite:

1. Successful completion of a full year of high school biology or equivalent

Course Description: One of the most fascinating and frightening aspects of disease, epidemics are known to have affected civilizations, medicine, and human interactions since the beginning of written history. If you were born even a century ago, your chances of dying or becoming disabled by an infectious disease as a child would have been very high. Thanks to modern medicine like antibiotics and vaccines, many of those childhood illnesses are all but eradicated in our world. Unfortunately, our battle against epidemic diseases continues, despite medical successes and our improved understanding of the causes and process of disease. New diseases are emerging, and those considered controlled are re-emerging in more virulent, resistant forms. News reports are documenting outbreaks of strange diseases in both underdeveloped regions and those with the highest levels of medical care. This dynamic course is designed to enable students to understand why new diseases are appearing and why those we thought conquered are reappearing. This is done in the context of basic concepts upon which our understanding of biology is built; the interdependence of life and the interconnectedness of our world.

35 Weeks	AP® Chemistry	Grades 11, 12
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Prerequisites:

1. One full year of high school Chemistry I-Honors, one full year of high school Algebra 2, and student must be taking Pre-Calculus, or Calculus.

Additional Requirements: Students will need to access a number of YouTube videos throughout the course. There is a \$75/year fee for each enrollment in a VHS AP® course. This course also requires a lab kit that must be purchased for an additional fee of \$200. The kit allows students to perform modified versions of several AP® Chemistry labs suggested by the College Board. Students will need to care for kit contents responsibly, follow directions carefully and work independently to suc-

successfully complete these labs. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3.

Course Description: This Advanced Placement Chemistry Course is equivalent to a full-year Introductory Chemistry college-level course. The rigor and pace of this course is consistent with that of many major colleges and universities, and will prepare students for the Advanced Placement Examination in May. Upon successful completion of the exam, students may receive college credit and will be well-prepared for additional advanced chemistry coursework. AP<sup>®</sup> Chemistry builds upon prior knowledge of Chemistry. Students will investigate topics such as chemical reactions, stoichiometry, atomic theory, periodicity, bonding, states of matter, thermodynamics, kinetics and equilibrium. This course incorporates a variety of textbook and multimedia resources and will require students to perform hands on and virtual experiments to develop a deeper understanding of chemistry. Students will engage in collaborative activities such as class discussions, contribute to class data and attend regular “lab meetings” throughout the course. AP practice quizzes and unit exams will help prepare students for the AP examination. Due to the rigor and pace of the content, this course is designed to challenge extremely motivated students who have a strong interest in Chemistry. The summer assignment is intended to review crucial content associated with pre-requisite knowledge for the course, where applicable, as well as to allow students to better understand the rigor associated with the content. The required summer assignment for AP<sup>®</sup> Chemistry can be found here: AP Summer Work. Students enrolled in Advanced Placement VHS courses are required to take the AP<sup>®</sup> exam, and to report their AP exam scores to VHS. By enrolling in an AP VHS class, the student authorizes their school administration to report AP<sup>®</sup> exam scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.

35 Weeks	AP <sup>®</sup> Physics 1	Grades 11, 12
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Prerequisite:

1. One full year of high school Algebra 2.

Additional Requirements: Students will need to access a number of YouTube videos throughout the course. Students will also use the Pearson Virtual Physics Lab program to complete select labs throughout the course. The Virtual Physics software package is available as a single downloadable compressed file linked within the course and requires a Windows operating system to run. \*Please note: There is a \$75/year fee for each enrollment in a VHS AP<sup>®</sup> course. There is also a lab kit for this course that must be purchased for an additional fee of \$225. The kit allows students to perform modified versions of several labs suggested by the College Board. Students will need to care for kit contents responsibly, follow directions carefully and work independently to successfully complete these labs. The lab kit price of \$225

is for courses running on a standard VHS schedule. International schools will be responsible for the shipping cost for the lab kit. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3.

**Course Description:** This Advanced Placement Physics 1 Course is equivalent to a first semester, algebra-based, Introductory Physics college-level course. The rigor and pace of this course is consistent with that of many major colleges and universities, and will prepare you for the Advanced Placement Examination in May. Upon successful completion of the exam, you may receive college credit and you will be well-prepared for additional advanced physics coursework. Students will investigate topics such as Newtonian mechanics (including rotational dynamics and angular momentum), work, energy, power, mechanical waves and sound. Students will also be introduced to electric circuits. This course incorporates a variety of textbook and multimedia resources and will require students to perform hands on and virtual experiments to develop a deeper understanding of physics. Students will engage in collaborative activities such as class discussions, contribute to class data and attend regular “lab meetings” throughout the course. AP practice quizzes and unit exams will help prepare students for the AP examination. Due to the rigor and pace of the content, this course is designed to challenge extremely motivated students who have a strong interest in Physics. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3. The summer assignment is intended to review crucial content associated with prerequisite knowledge for the course, where applicable, as well as to allow students to better understand the rigor associated with the content. The required summer assignment for AP<sup>®</sup> Physics 1 can be found here: [AP Summer Work](#). Students enrolled in Advanced Placement VHS courses are required to take the AP<sup>®</sup> exam, and to report their AP<sup>®</sup> exam scores to VHS. By enrolling in an AP<sup>®</sup> VHS class, the student authorizes their school administration to report AP<sup>®</sup> exam scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.

15 Weeks	Forensic Science - Academic	Grades 11, 12
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Prerequisites:

1. Biology I and Chemistry I

Additional Requirements: household materials for labs

**Course Description:** Forensics will provide students with an in-depth knowledge of techniques and strategies used by forensic scientists. They will learn the steps involved in analyzing a crime scene in order to provide evidence that will be admis-

sible in a court of law. Emphasis is placed on the investigative process. They will get a detailed knowledge of the industry in order to explore the potential for careers in forensic science. Students will research different methods that forensic scientists use to solve crimes and analyze crime scene data to solve crimes themselves. Topics include collecting evidence, fingerprinting, blood-typing, ballistics, trace evidence, anthropology, and of course, DNA!

15 Weeks	Nuclear Science - Academic	Grades 11, 12
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Prerequisites:

1. Chemistry I and Physics I The student should have a basic understanding of atomic structure and have some experience with graphing calculators.

Course Description: Formerly titled Nuclear Physics. The focus of this course are the scientific, technological, and societal implications arising from nuclear physics. Students have an opportunity to explore, in-depth, a topic that has played a major role in the science, technology, politics, philosophy, and everyday life of the past century. The student's primary goal during the course is to answer the question: "What should an informed citizen know about nuclear issues?" The student has some flexibility choosing the areas they wish to concentrate on. The science topics in the course include the history of discovery, types of nuclear reactions, interactions between radiation and matter, the standard model of subatomic matter and current research. Although some math is used to provide better understanding of the concepts covered, math problems are not the primary focus of the course. The technology portion includes the design and function of particle detectors, particle accelerators, nuclear reactors, nuclear bombs and nuclear waste facilities. Current and future uses of radiation in industry and medicine are also investigated. The society portion of the course is the one where many students concentrate their efforts. The weekly discussions on controversial nuclear topics are always interesting. They provide opportunities to look back at the politics behind weapons development and use, the Cold War, nuclear proliferation, and the atomic energy industry. Discussions during the course will include topics that have made recent headlines; such as food irradiation, nuclear reactors in space, Radon mitigation, the demise of the Super-Conducting Super-Collider, the theft of nuclear secrets, and nuclear test ban treaties.

35 Weeks	AP <sup>®</sup> Physics C	Grades 11, 12
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Prerequisites:

1. Grade of B+ or better in prior full-year, algebra-based Physics class.
2. Physics I, Physics II

Additional Requirements: Students will need to access a number of YouTube videos throughout the course. There is a \$75/year fee for each enrollment in a VHS AP<sup>®</sup> course. This course also requires a lab kit that must be purchased for an additional fee of \$225. The kit allows students to perform modified versions of several AP<sup>®</sup> Physics C labs suggested by the College Board. Students will need to care for kit contents responsibly, follow directions carefully and work independently to suc-

successfully complete these labs. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3.

**Course Description:** This Advanced Placement Physics Course is equivalent to a full-year introductory college-level course, for scientists and engineers, which introduces the main principles of Mechanics and Electricity & Magnetism. The rigor and pace of this course is consistent with that of many major colleges and universities, and will prepare students for the two-part Advanced Placement Examination in May on 1) Mechanics and 2) Electricity and Magnetism. AP<sup>®</sup> Physics C builds upon prior knowledge of Physics. Students will investigate topics such as Newton's Laws of motion, energy, linear and angular momentum, gravitation, oscillatory motion, electric and magnetic fields, Gauss's Law, circuits and Faraday's Law. The course uses complex mathematical problem solving techniques, including differential and integral calculus, as well as a variety of textbook and multimedia resources, and hands-on and virtual experiments, in order to develop a deeper understanding of physics. Throughout the course, students will engage in collaborative activities such as class discussions, contribute to class data, attend regular "lab meetings", and document their experimental findings in a laboratory notebook. AP practice quizzes and unit exams will help prepare students for the AP examination. Due to the rigor and pace of the content, this course is designed to challenge extremely motivated students who have a strong interest in Physics. The summer assignment is intended to review crucial content associated with prerequisite knowledge for the course, where applicable, as well as to allow students to better understand the rigor associated with the content. The required summer assignment for AP<sup>®</sup> Physics C can be found here: AP Summer Work. Students enrolled in Advanced Placement VHS courses are required to take the AP<sup>®</sup> exam, and to report their AP exam scores to VHS. By enrolling in an AP VHS class, the student authorizes their school administration to report AP<sup>®</sup> exam scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.

15 Weeks	Physics: Mechanics - Academic	Grades 11, 12
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Prerequisites:

1. Physics I, Algebra II/Trig., Pre-calculus (concurrently with mechanics)

Additional Requirements: Household items for completing labs

**Course Description:** From the top of Mt. Everest to tiny viruses, physics is everywhere! We will explore many aspects of physics in mechanics, which you can then apply to further scientific or engineering study. Our exploration will include a variety of interesting hands-on experiments where you will be able to share and discuss your data and conclusions with your classmates. In addition, we will discuss a connection to our world each week that will range from the latest innovations, to forensic analysis of events that occurred half a century ago. Physics: Mechanics pro-

vides students with a firm foundation in Newtonian mechanics, and will introduce students to areas of mechanics including: vectors, motion, free fall, Newton's Laws of motion, work, energy, rotational motion, and gravity. Online reading, engaging simulations, and lectures are used throughout the course to introduce students to concepts. Students tests forces and motion on ramps, see-saws, and roller coasters with weekly simulations. In addition, students will have the opportunity to engage in weekly hands-on laboratory activities to apply their understanding of physics to a wide range of areas including: chemistry, when they measure motion in molecules as they are absorbed by paper; sports mechanics, when they measure their jump speed, and reaction time, and aeronautics and engineering, when they measure the flight of projectiles and test the lifting power of student-designed helicopters. The course is an outstanding introduction for students who wish to continue further into AP Physics 1, or as a stand-alone course for further study later on. Please join us as we embark on this journey to understand the most fundamental science--PHYSICS!

## ENGLISH

15 Weeks	Film and Literature - Academic	Grades 11, 12
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Prerequisite:

1. English 10 Honors

Additional Requirements: Materials used within this course are readily available, and students will be selecting their own materials from a variety of sources.

Course Description: In this course, students will become movie critics, readers of some of the world's finest 20th century novels, and work on unique projects with students around the world. Participant will explore the momentous events of the 20th century as they were depicted in literature and on film. The course focuses on three pivotal changes. 1) WWI and the Russian Revolution; 2) 1920's - WWII; 3) the Cold War. The course will bring students through those periods through the literature of the time.

In addition to reading literary works (from Pasternak's "Dr. Zhivago" to Forsyth's "The Odessa File"), students will also view the film adaptations that portray the lives of the people living during this fascinating time.



15 Weeks	<b>Shakespeare in Film - Honors</b>	Grades 11, 12
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Prerequisite:

1. English 10 Honors

Additional Requirements: All books for this course are available online at [shakespeare@mit.edu](mailto:shakespeare@mit.edu).

Students who desire a traditional textbook should purchase one at their own cost through Amazon.com or a similar website.

Course Description: “‘Tis needful that the most immodest word Be looked upon and learned.” – Henry IV, Part Two

In this class, students will read four Shakespearean plays - Romeo and Juliet, Much Ado About Nothing, Henry V, and Hamlet - and then view a variety of scenes from these plays performed by many popular actors (including Leonardo DiCaprio, Mel Gibson, Emma Thompson and Kenneth Branagh). The focus of the assignments will be discussions and compositions on choices the actors and directors have made and how those different choices lend different meanings to the plays. Some of the topics include: family relationships, love, imagery, life, decisions, tragedy vs. comedy, visual and aural aspects of a film, death and many other common literary themes as well as film technology.

15 Weeks	<b>Twentieth Century Women Authors</b>	Grades 10, 11, 12
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Course Description: This English course will explore literature written by America's female novelists. We will begin the course with material written at the start of the twentieth century and trace its progression to the new millennium. Through research on the author's background and critical analysis of the writing, students will chronicle in historical context the changing role of women socially, politically, and economically.

Students who enjoy literature and history are encouraged to sign up for this course. This class does not have a gender bias.

# SOCIAL STUDIES

35 Weeks	AP® Psychology	Grades 11, 12
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**Additional Requirements:** This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3. The summer assignment is intended to review crucial content associated with prerequisite knowledge for the course, where applicable, as well as to allow students to better understand the rigor associated with the content. The required summer assignment for AP® Psychology can be found here: AP Summer Work.\*Please note: There is a \$75/year fee for each enrollment in a VHS AP® course.

**\* Course Description:** The AP® Psychology course is designed around a variety of assignments that promote acquiring a deep understanding of content, as well as developing study and writing skills necessary to be successful on the advanced placement exam. While preparation for the AP® Exam is an important goal of the course, helping students to better understand themselves and the behavior of others is another important aspect of the course. Students should expect weekly reading assignments in the ebook, Meyers' Psychology for AP® in addition to research, writing, group work, and participation in discussions. Tips for completing multiple choice questions and writing the essay part of the exam are part of the instruction for this course. Students will be given numerous opportunities to review and practice for the AP exam throughout the course. Students enrolled in Advanced Placement VHS courses are required to take the AP® exam, and are required to report their AP® examination scores to VHS (note: students who are failing their AP® class are not required to take the exam). Upon receipt of the student's exam score, each score will be recorded by VHS and assigned an anonymous tracking number to ensure student anonymity and confidentiality. By enrolling in an AP® VHS class, the student authorizes their school site coordinator and school administration to report AP® examination scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses. The summer assignment is intended to review crucial content associated with prerequisite knowledge for the course, where applicable, as well as to allow students to better understand the rigor associated with the content.

35 Weeks	AP® World History	Grades 10, 11, 12
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**Additional Requirements:** Powerpoint and the latest version of Adobe Acrobat Reader. To use all of the features of MyHistoryLab and the on-line text, students will need the following plug-ins: Adobe Acrobat Reader and Flash. There is a \$75/year fee for each enrollment in a VHS AP® course.

**Course Description:** This is a college-level history course designed to meet the needs of highly motivated students who have a strong interest and ability in history. The program prepares students for intermediate and advanced college courses by making demands upon them equivalent to those made by full-year introductory college

courses. The student is expected to read and analyze both primary and secondary source materials and to demonstrate ability to interpret and evaluate these sources in essay form. Students will take the Advanced Placement World History exam in May, as preparation for this exam is a major goal of this course. Therefore, the course is content driven with heavy emphasis on written critical analysis. Extensive reading writing and class discussions are integral components of the program. The AP® program in World History is designed develop a greater understanding of human societies. The course covers world history from approximately 8,000 B.C.E. to the present. Students enrolled in Advanced Placement VHS courses are required to take the AP exam, and are required to report their AP examination scores to VHS (note: students who are failing their AP class are not required to take the exam). Upon receipt of the student's exam score, each score will be recorded by VHS and assigned an anonymous tracking number to ensure student anonymity and confidentiality. By enrolling in an AP® VHS class, the student authorizes their school site coordinator and school administration to report AP® examination scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.

15 Weeks	<b>Modern Middle East - Honors</b>	Grades 10, 11, 12
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Additional Requirements: Streaming video access (for YouTube videos), Elluminate access, Windows Media or Real Player, Quicktime, Adobe Reader

Course Description: This course explores the history of the Middle East (focusing primarily on the last century), and examines the relationships within the region and beyond. Topics of study include the development of Islam, the impact of imperialism, the rise of nationalism, the effects of British and French rule, Arab-Israeli relations, and the political and economic impact of oil. Since 9/11, interest in the Middle East and Islamic studies has increased dramatically. In response, media, schools, politics, and pop culture, have all expanded their coverage of the region and its culture. As a student in this course, you are part of a larger movement seeking to better understand the people, ideas, and events of this area. Moreover, you will form your own generalized and nuanced understanding of the Middle East.

15 Weeks	<b>Peacemaking - Academic</b>	Grades 10, 11, 12
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Additional Requirements: The books for this course are delivered to students as Kindle ebooks. Students will need to download the free Kindle app. If students prefer a physical book, they should buy a copy or get it through their library.

Course Description: Peacemaking is about power. It is about realizing and utilizing your personal power, by recognizing that there are alternatives to violence and to a "win-lose" philosophy of life. Peacemaking is an active process, not a passive exercise. Peacemaking is an interdisciplinary course exploring Peace and Peacemaking in four interrelated ways - the personal, interpersonal, communal and global. Through exploration, evaluation, reflection and discussion we will better understand our own roles and responsibilities as peacemakers. Topics covered will include: service for the sake of peace, forgiveness, understanding, contemplation, philosophies of

non-violence, and peacemakers past and present among the Nobel Peace Prize Laureates. Readings include works by Thich Nhat Hanh, Martin Luther King, The 14th Dalai Lama, Mohandas Gandhi, Simon Wiesenthal and others. Projects will include a Peace Offering and creation of a multimedia project: assembling Pieces of Peace. Discussion will be open and spirited. Learning is a collaborative process.

15 Weeks	Philosophy I - Honors	Grades 10, 11, 12
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In this course, students are invited to participate in an activity that is over 2500 years old and expected to develop their own ideas about philosophical problems, theories and arguments. Students will be challenged to think critically, while taking into consideration what the others had and have to say about those matters. Philosophy enhances the improvement of the analysis of personal convictions, the understanding of the diversity of arguments of others and the awareness of the limited character of our knowledge. In this sense, philosophy is a basic and important part of education and an instrument for making democratic life deeper. Participants in this philosophy course will be challenged to think critically and learn to think with the ideas and points of view of past and contemporary philosophers. Students will write, read and debate extensively, always by means of an argumentative discourse and weekly assignments.

15 Weeks	Constitutional Law - Honors	Grade 12
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Prerequisite:

1. Completion of U.S. Government

Course Description: This class explores the history and development of the United States Constitutional legal system. The primary focus will be on the basic principles of law, the judicial system and judicial/political behavior in U.S. history. Central themes of the course focus on the U.S. Supreme Court's interpretation of law, power, and legal precedent. Students will read and listen to condensed versions of selected Supreme Court cases. Contemporary legal issues, including immigration law, and intellectual property law are also examined.

15 Weeks	Psychology of Crime - Honors	Grades 11, 12
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Students will learn how psychology applies to questions and issues relating to law and the legal system. The course will include all aspects of the legal system including police, the trial and corrections. Topics will include: recovered memories, children as victims and offenders, violence and murder, strategies for interviewing witnesses, expert testimony, and factors influencing the credibility of witnesses, victims and offenders and insanity. Students will also examine the relationship of psychology and law in the educational and work settings. Please note that this course contains an end-of-course proctored exam. Instructions for students to identify an appropriate adult proctor are included in the course lessons.

35 Weeks	AP® Human Geography	Grades 10, 11, 12
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Additional Requirements: There is a \$75/year fee for each enrollment in a VHS AP® course. Technology Requirements: Adobe Acrobat Reader and Flash Microsoft Word or Windows Wordpad Windows Media Player External headset and microphone High speed internet connection. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3.

Course Description: The AP® Human Geography course, designed to meet the needs of highly motivated students, is organized around the major themes of human interactions within a shared world that considers the questions, where and why. Where do people live and why or how do cultures influence human behavior? Students will study the elements of sociology, anthropology, religion, politics, economics, and psychology that help students understand how to make sense of others and themselves in a locality, region and the world. The course is offered at a college level class and will require rigorous work and effort. Students should expect to complete a variety of readings, writings, and practice exams as well as to participate in many discussions and activities. It is expected that students will take the Advanced Placement Human Geography exam in May, as preparation for this exam is one of the major goals of the course. The course will introduce students to the systematic study of patterns and processes that have shaped human understanding, use, and alteration of Earth's surface. Students will employ spatial concepts and landscape analysis to examine human social organization and its environmental consequences. They will also learn about the methods and tools geographers use in their science and practice. The seven topics include Geography: Its Nature and Perspectives, Population, Cultural Patterns and Processes, Political Organization of Space, Agriculture and Rural Land Use, Industrialization and Economic Development and Cities and Urban Land Use. A significant outcome of the course is students' awareness of the relevance of academic geography to everyday life and decision making. This combination of the academic and the applied gives students a sophisticated view of the world and an understanding of the manifold applications of what they have learned in the course. Students enrolled in Advanced Placement VHS courses are required to take the AP® exam, and to report their AP® exam scores to VHS. By enrolling in an AP® VHS class, the student authorizes their school administration to report AP® exam scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.

15 Weeks	World Religions - Academic	Grades 9, 10, 11, 12
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Humans are social beings and religion is an essential part of our human culture. The study of the world's religions, through the social studies lens, offers us an opportunity to examine how cultures around the world and over time have struggled to find meaning and purpose in life and how this understanding informs their lives.

Developing literacy about other religions helps to foster tolerance and understanding in our diverse world. This semester course will look at some of the world's major religions: Hinduism, Buddhism, Judaism, Christianity and Islam. Each will be examined without acknowledging the superiority of any one over the others. The course will begin with an overview of how religion is constructed and world views formed. Later, the history of each of the mentioned religions will be looked at, as well as its beliefs and practices. If you want to understand better how different religions deal with issues such as: the relationship of man with God, the relationship of man with other mankind and man with the world, and life after death; then this is the course for you. This course will require extensive reading, interaction with your classmates, tests and a final investigative project.

15 Weeks	Criminology - Academic	Grades 11, 12
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Prerequisite:

1. Students must be mature enough to handle subject matter that can be upsetting in nature.

Course Description: How could somebody commit such an unspeakable act, or how could someone who seemingly has everything throw it all away doing something illegal? Does a person's environment increase the likelihood of becoming a criminal or is criminality an inherited trait? Criminology will explore the reasons why people commit crimes. This course first will examine why laws were created and how they evolve over time in response to society's needs. Then, the focus will move to the theoretical perspectives of criminal behavior, including biological, psychological and sociological theories. Students will delve into the minds of serial killers, thieves, drug dealers, and even corporate criminals while examining notable and notorious criminals. Finally, the class will explore the treatment of criminals by the correctional system. Students will be asked to design a policy statement for crime prevention and treatment programs for criminals. Some of the issues we'll discuss are: three main types of crime, Prevalence of crime, connection between drugs and crime, indicators of danger, predicting criminal behavior, and competency standards. \*Please note that some of the subject matter in this course can be upsetting because the nature of crime can be violent. If your sensibilities are easily upset, a different course might be more suitable.

Prerequisite:

1. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3. The summer assignment is intended to review crucial content associated with pre-requisite knowledge for the course, where applicable, as well as to allow students to better understand the rigor associated with the content.

Course Description: AP® European History is a rigorous academic course that is structured around the investigation of five course themes from 1450 to the present. It prepares students for the demands of a college education by emphasizing the development of nine specific historical thinking skills while providing extensive experience in college level reading, writing and responsibility for learning. The challenging and stimulating curriculum of AP European History requires much more time than other high school courses. Solid reading and writing skills, along with a willingness to devote considerable hours to homework and study, are necessary to succeed. This course promotes effective time management and organization skills and is structured specifically to meet new criteria set forth by the College Board.

During this full-year course, students will investigate the broad themes of interaction between Europe and the World, Poverty and Prosperity, Objective Knowledge and Subjective Visions, States and Other Institutions of Power, and the Individual and Society, while making crucial connections across four different chronological periods ranging from 1450 to the present. In addition, the course is focused toward 19 key concepts, which enable students to better understand, organize, and prioritize historical developments within a chronological framework. As students learn to analytically examine historical facts and evidence, they will gain deeper conceptual understandings of critical developments in European history and will understand issues from multiple perspectives.

This course specifically encourages the development of students' skills in the categories of chronological reasoning, comparison and contextualization, construction of evidence-based arguments, and interpretation and synthesis of historical narratives, all competencies essential for college and career success.

Throughout the course, AP European History students can expect to:

1. Watch or listen to traditional history lectures produced by the teacher or offered by colleges and universities online.
2. Participate in class discussions of primary documents, course themes, and key events in threaded discussions.
3. Use historical facts and evidence to debate key issues or role-play historic figures through student audio recordings.
4. Demonstrate historical thinking skills through essays designed to meet the requirements outlined by the College Board for Advanced Placement

exams.

5. Collaborate with other students in research groups using Web 2.0 information tools.
6. Utilize supplement traditional textbook reading with historical journals and primary documents.

Students enrolled in Advanced Placement VHS courses are expected to take the AP® exam, and to report their AP® exam scores to VHS. By enrolling in an AP® VHS class, the student authorizes their school administration to report AP® exam scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.



# FOREIGN LANGUAGE

35 Weeks	AP® French Language and Culture	Grades 11, 12
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Prerequisite:

1. Students must have completed all French offerings at DCHS.

Additional Requirements: Students will need access to Power Point, Quick Time, and Real Player. This course requires students to have access to a computer with headphones, microphone, and software to record voice and save in WAV format. Students must also be able to download MP3 files to school computers. Instructions will be provided for Sound Recorder, used in Windows. Audio recording requires Adobe Flash 10.1 or later. Other software may be substituted, as long as it has the ability to record up to 2 minutes of voice in the WAV format. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3. There is a \$75/year fee for each enrollment in a VHS AP® course.

Course Description: The AP® French Language and Culture course is designed to promote proficiency in French and to enable students to explore culture in contemporary and historical contexts. The course focuses on interpersonal, interpretive and presentational communication, encourages cultural awareness, and incorporates the six themes of global challenges, science and technology, contemporary life, personal and public identities, families and communities and beauty and aesthetics. By using these six course themes outlined in the AP® curriculum, students will increase their cultural knowledge and experience with the Francophone world through a comparison with their own cultural experience. Instructional content will include the arts, current events, literature, sports, and more. In addition to textbooks, materials will include websites, podcasts, films, newspapers, magazines, and literature. The course helps develop language skills that can be applied beyond the French course in further French study and everyday life. AP® French will enable advanced French students to improve writing skills and problem-solving techniques in preparation for the AP® French Language Exam. Students will explore the French-speaking world through a variety of perspectives based on authentic and up-to-date materials and the use of French media like TV5 Monde, while gaining a better understanding of themselves. A variety of assignments and activities will be included. For example, students would read and discuss poetry, create their own poetry and showcase their poems in a class magazine. Another example is that students might participate in an online mock trial after researching France's role in the slave trade and which key figures were involved. They would assume the roles of those figures who lived during that specific time period. Also, students will read an important work of classic or contemporary literature, write an essay that focuses on a specific theme or aspect and then participate in a discussion that addresses comprehension, stylistic techniques and relevant historical or situational background. Current events in French

society, politics, culture, education, etc. would also drive assignments and activities regarding discussions, debates, written work and research that encourage students to consider their own views, in oral and written formats as well as those of their peers. Students enrolled in Advanced Placement VHS courses are required to take the AP® exam, and to report their AP® exam scores to VHS. By enrolling in an AP® VHS class, the student authorizes their school administration to report AP® exam scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.

35 Weeks	AP® Spanish Language and Culture	Grades 11, 12
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Prerequisite:

1. Students must have completed all French course offerings at DCHS.

Additional Requirements: Students will need access to Power Point, Quick Time, and Real Player. This course requires students to have access to a computer with headphone, microphone, and software to record voice and save in WAV format. Instructions are provided for Sound Recorder, used in the D2L course. Other software may be substituted, as long as it has the ability to record up to 2 minutes of voice in the WAV format. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3.

Course Description: AP® Spanish Language is intended for highly motivated students who wish to develop proficiency and integrate their language skills, providing frequent opportunities for students to use authentic materials and sources. Not only will they be prepared for the AP® Spanish Language exam in May, but they will also gain an insight into the cultural aspects of Spain and other Spanish-speaking countries. Students will be exposed to many different forms of written and spoken Spanish through the study of poems, short stories, newspaper articles, along with radio and television broadcasts. The course will: Encourage a thematic approach to teaching. Students participate in activities that integrate language, literature, and culture; make connections to other disciplines; and compare aspects of the target culture with other cultures. Articulate clear learning objectives. Clearly articulated learning objectives provide information on the knowledge and skills students should demonstrate to succeed on the exam. Reflect college-level expectations. The College Board collaborates with language educators from leading colleges, universities, and secondary schools to ensure that the course reflects rigorous college standards. Students enrolled in Advanced Placement VHS courses are required to take the AP® exam, and are required to report their AP® examination scores to VHS . Upon receipt of the student's exam score, each score will be recorded by VHS and assigned an anonymous tracking number to ensure student anonymity and confidentiality. By enrolling in an AP® VHS class, the student authorizes their school site coordinator and school administration to report AP® examination scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.

15 Weeks	Mandarin Chinese Language and Culture - Academic	Grades 11, 12
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Prerequisite:

1. Completion of two years of a language at DCHS.

Additional Requirements: Students will need access to Power Point, Quick Time, and Real Player. This course requires students to have access to a computer with headphones, microphone, and software to record voice and save in WAV format. Students must also be able to download MP3 files to school computers. Instructions will be provided for Sound Recorder, used in Windows. Other software may be substituted, as long as it has the ability to record up to 2 minutes of voice in the WAV format. Students will also need to have the Chinese language bar installed and activated. This is a free function of Windows XP.

Course Description: Mandarin Chinese Language and Culture introduces the essential elements of Chinese language for the novice who has had minimal exposure to the Chinese language and culture. Upon completion, the student will understand the basics of Chinese grammar, the origins of Chinese characters and their pronunciation. The course will also introduce the student to a broad range of topics in Chinese culture. Upon completion, the student will have an understanding of what makes Chinese culture unique, as well as differences and similarities between Chinese culture and the student's native culture.

15 Weeks	Russian Language and Culture - Academic	Grades 11, 12
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Prerequisite:

1. Completion of two years of a language at DCHS.

Additional Requirements: Students will need access to Power Point and RealPlayer, as well as Internet, including YouTube website. This course requires students to have access to a computer with headphones, microphone, and software to record voice and save in WAV format. Students will also need to have the Russian language bar installed and activated. This is a free function of Windows XP.

Course Description: Join a 15-week-long journey across the globe and time to learn the basics of Russian language and culture. Students will learn survival Russian: from simple greetings and introductions to the ability to sustain a simple conversation in certain situations. Knowledge of Russian culture and its traditions will help participants not only communicate better in Russian, but also avoid cultural misunderstandings. The class will explore the culture, past and present: art, music, literature, traditions, holidays, history, and the people. Students will take a virtual tour of the Hermitage State Museum in St. Petersburg, listen to Russian songs, watch Mariinsky Theater Ballet performances, enjoy Russian rock and watch excerpts from Russian movies and cartoons. Throughout the course, students will be introduced to the richness of Russian culture and language. They will communicate in elementary Russian, form and share opinions and attitudes about Russia and its culture, and compare and analyze the differences and similarities between English and Russian languages.

# ARTS

35 Weeks	AP <sup>®</sup> Art History	Grades 10, 11, 12
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Additional Requirements: Access to Adobe Reader, Java, and Quicktime, audio capabilities, access to a printer and digital camera, microphone recording capability preferred but not required. This course may not be appropriate for students with specific accessibility limitations as written. Access to Adobe Reader, Java, and Quicktime, audio capabilities, access to a printer and digital camera, microphone recording capability preferred but not required. There is a \$75/year fee for each enrollment in a VHS AP<sup>®</sup> course. This AP course has a required summer assignment. Students are expected to complete their summer assignment before the course begins and submit their work by the end of Week 1. Students who register on or after September 1st will receive an extension to complete the summer assignment by the end of Week 3.

Course Description: “The function of the art is not only to show life as it is, but to show life as it should be.” -W.E.B. DuBois What is art? How is it made? What inspires art styles and revolutions? How can we respond and describe our own reactions to art? The visual language of human beings speaks more directly and immediately through the ages than any other form of human communication. Exploring the world through the study of art and architecture enables us to understand our times as well as those that have come before all over the globe. Advanced Placement<sup>®</sup> Art History builds the visual literacy and critical thinking skills needed to effectively analyze art across time and place. The framework of the AP<sup>®</sup> Art History course encourages students to develop deep understanding of representative art works from diverse cultures, including the fundamental knowledge that places these works in context and articulates the relationships among them. The curriculum conveys the big ideas and essential questions at the center of an investigation into the world art and art production. Clear learning objectives that represent the art historical skills valued by art historians and higher education faculty will inform class assignments. Students will acquire a comprehensive knowledge of historically significant artists, movements, aesthetic theories and practices, ranging from the prehistoric times to the significant contributions in the 21st Century. Art production of all cultures will be studied in relative proportion to their representation on the Art History Advanced Placement Exam. Students will see the development of trends, movements, and events in art, how they reflected and affected the times in which they occurred, gaining insight into typically misunderstood topics pertaining to the visual arts. Students will research and write knowledgeably on a number of art history topics, reflecting and synthesizing their own theories on the many works they will see in virtual museums and collections. They will be expected, through carefully structured assignments, to exhibit an extensive scholarship in conjunction with these experiences. Students enrolled in Advanced Placement VHS courses are required to take the AP exam, and to report their AP exam scores to VHS. By enrolling in an AP<sup>®</sup> VHS class, the student authorizes their school administration to report AP<sup>®</sup> exam scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.

15 Weeks	<b>Art History - Honors</b>	Grades 10, 11, 12
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Additional Requirements: Access to a scanner, Windows Media Player or an equivalent program, and ability to attach images. It is strongly recommended that students have access to a digital camera.

Course Description: Why do Impressionists seem so mundane now but were so shocking in their day? Why did Pollock toss and drip all that paint around and get paid a lot of money for it? What was all the hoopla at the Brooklyn Museum a few years ago? This course is designed to emulate a college level 'survey' course in Art History that will answer these questions and raise a few more. It begins in the Renaissance in Western Europe, because 1500 was an important moment for Western culture, and finishes off the second half of the millennium. Students will visit virtual museums all over the world, and look at the connections among various types of art that have been created for the past 500 years. This course aims to expand the student's understanding and love of history and visual art. As in any art history course, images of the nude human figure will be viewed and discussed. Some controversial topics will be raised during the course, particularly when discussing censorship and contemporary art. \*\*This course may not be appropriate for students with specific accessibility limitations as written.

15 Weeks	<b>History of Photography - Honors</b>	Grades 10, 11, 12
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Additional Requirements: Access to a scanner is required. Students do not need to have a camera or a darkroom.

Course Description: This course will explore the use of photography as a record of visual history - not just the use of photography for documentation, but also as a reflection of technological developments, social trends, and as a means of personal expression. Students will examine the works of famous photographers, from its beginnings in the 19th century to contemporary times, and will develop an aesthetic vocabulary. In addition, they will have opportunities to exchange ideas and explore subject matter through class discussion forums and teamwork. They will also create studio assignments in order to gain an appreciation for how photography can be used as a means of personal expression.

15 Weeks	<b>Creating Art History - Academic</b>	Grades 9, 10, 11, 12
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Additional Requirements: Students must have access to scanner or digital camera. Students will also need these items for completing projects: a sketchbook, watercolor set, drawing pencils, three pieces of watercolor paper, one piece compressed charcoal.

Students may be required to download (free) software from the Internet.

Course Description: This is a practical course. Students will learn Art History by both looking at art and creating their own art. The virtual learning space is an artist's studio. This studio will be the workplace to share insights, collections, inspirations, and to critique each other's work.

This is a thematic approach to Art history, rather than chronological. Ideas within the themes of self-portrait, conflict, simplicity, storytelling, and the natural world will be explored. Students will collect and create art that communicates their own ideas of each theme. After traveling to online art museums and artists' studios and creating a drawing, painting, ink wash and a handmade book, students will design their own exhibits.

This is a combination of traditional and modern methods. Traditional (drawing, painting) and modern (image manipulation) media will be employed. Students will sketch, paint, draw, and collage into pages of a sketchbook. These pages will be scanned or photographed with a digital camera and displayed for the class. Technology will transform art, ideas, comments, critiques, sketches, and collections into an interactive and collaborative Art History.

## TECHNOLOGY EDUCATION

15 Weeks	CAD - Academic	Grades 10, 11, 12
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Prerequisite:

1. Recommended: Intermediate level of Windos OS navigation.

Course Description: CAD introduces students to the world of engineering drawings. CAD students will learn how to create 3D drawings of mechanical objects, layer these drawings with dimensions and annotations, and extend the representation of 3D models and assemblies through presentation and animation tools. Students will also use the design process to convert their original ideas and solutions into new 3D models and working drawings, without the use of step-by-step instructions. All drawings are prepared to the standards of the industry.

Students will create 3D models, assemblies, formal 3-view drawings with dimensions, plus presentations and animations. Each week, students will be introduced to a new set of drawing skills. Students will use the free educational version of Autodesk Inventor 2015, a respected industry-level CAD software program.

\*Please note this course contains a final exam.

15 Weeks	Engineering Principles - Academic	Grades 10, 11, 12
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Prerequisite:

1. Algebra skills (formula solving, substitution, and evaluation,) basic geometry knowledge (shapes, areas, visualization of cross-sections)

Course Description: Why don't buildings and bridges fall down more often? Because there are people who have the skills to put together the right materials in the right shape to make them stay up –sometimes even during large earthquakes, tornadoes, and hurricanes. Have you ever looked at impressive structures like large bridges or skyscrapers and wondered why they don't fall down more often? Perhaps you are the kind of person who assumes that structures are all pretty safe. But even a quick look at the history of buildings will show you that they don't always work. What made the Tacoma Narrows Bridge fall apart in a tame wind in 1940? Why do buildings in Los Angeles survive large earthquakes, while others in other parts of the world (such as in Bam, Iran, 2003) are flattened? This course will introduce students to the engineering world that helps to understand these questions, and to lead some people into the professions related to structural engineering.

## MATHEMATICS

15 Weeks	Mathematics of Electricity - Academic	Grades 10, 11, 12
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Prerequisite:

1. Pre-Algebra

Course Description: This 15-week semester-long mathematics course was designed to develop pre-algebra and higher level mathematics skills using real-world electrical power industry activities and problems. This course will introduce high school

15 Weeks	Math and Modern Logic - Honors	Grades 10, 11, 12
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Prerequisite:

1. Completed or currently enrolled in Pre-Calculus

Course Description: The focus of this course is the development of sound reasoning abilities through the study and application of the tools of logical analysis. Students taking this course will learn the tools of logical argument analysis, how to mathematically model and evaluate syllogistic forms of arguments, and how to represent arguments in symbolic form. They will learn the tools necessary to establish the validity of an argument and the fundamentals of inductive analysis. This course is designed for students who enjoy mathematics with a philosophical twist and are planning on pursuing careers in mathematics, the sciences, or engineering.

35 Weeks	AP <sup>®</sup> Calculus BC	Grades 10, 11, 12
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Prerequisites:

1. In addition to the enrollment fee, this course has an AP<sup>®</sup> fee of \$75.
2. Students must have access to a graphing calculator (preferably a TI-83/TI-84).
3. The required summer assignment for AP<sup>®</sup> Calculus

The Advanced Placement Calculus BC course is equivalent to both the Calculus I and Calculus II college-level courses. The rigor and pace of this course is consistent with calculus offerings at many colleges and universities and will prepare students for the Advanced Placement Exam. Upon successful completion of the exam, students may receive college credit and will be well-prepared for additional advanced mathematics coursework.

AP<sup>®</sup> Calculus BC builds upon prior knowledge in previous mathematics coursework. Students will explore topics within four big ideas covered in this course: (1) limits, (2) derivatives, (3) integrals and (4) series. This course allows students to gain conceptual understanding through discussions, group activities and investigations. Students will learn how to use the graphing calculator to help solve problems, experiment, interpret results and support conclusions. In order to prepare for the exam, students will complete weekly AP<sup>®</sup> practice quizzes and unit exams that will conform to the constraints of the AP<sup>®</sup> exam.

## MUSIC

35 Weeks	AP <sup>®</sup> Music Theory	Grade 12
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Prerequisite:

1. Proficiency in playing major and minor scales, reading basic tonal melodies, and using proper technique on one or more musical instruments (vocal, orchestral, band).

**Strongly Recommended:** At least one semester of practice writing traditional music notation with proper technique. At least one semester of keyboard instruction, including scales and triad formation. This course has additional fees.

**Additional Requirements** Hardware used: internal/external speakers or headphones; internal/external microphone. Software used: Teoria.com web-based ear training exercises, Noteflight.com web-based music notation environment. Specific URLs accessed: multiple addresses at domains “noteflight.com,” “macgamut.com,” and “screencast-o-matic.com” There is a \$75/year fee for each enrollment in a VHS AP<sup>®</sup> course. There is also a \$75 music lab fee. **Course Description:** This course is designed to give the student an understanding of music theory, sight reading, and aural skills that is equivalent to that of a first-year college music student. It is also designed with the explicit purpose of preparing the student for the AP<sup>®</sup>; Exam in Music Theory. The course content and presentation will adhere to the guidelines



set forth by the College Board in the Music Theory Course Description. The course will cover: the fundamentals of traditional melodic and harmonic composition through the early twentieth century; multiple techniques for melodic, harmonic, and formal analysis; an introduction to two- and four-voice counterpoint; an introduction to jazz, blues, and non-Western techniques; and the basics of orchestration. In addition, students will be trained to sight-read melodies in major and minor keys, with limited chromatic alteration. They will also perform listening exercises for the purposes of memorizing and notating specific intervals, scales, chords, rhythms, melodies, and progressions.

15 Weeks	Fundamentals of Music Composition - Academic	Grades 9, 10, 11, 12
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Prerequisite:

1. Proficiency in reading basic tonal melodies in treble and bass clefs.

Recommended: At least one semester of applied musical instruction, including scales, technique, and triad formation (where applicable).

Course Description: This course is designed to give students a good understanding and working knowledge of the fundamental components of music, and to lead them through the process of creating their own compositions. The course will focus on music composed in the Western tonal style. Students will practice techniques in creating effective melodies, supporting harmonies, rhythmic patterns, and phrases.

Students will make step-by-step progress on a number of original composition projects. With the instructor's guidance, students will work as a class to provide ongoing feedback for each young composer. The support of the full class will aid individual students as they work to revise and complete their music.

15 Weeks	Music Listening and Critique - Academic	Grades 11, 12
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Additional Requirements: The books for this course are delivered to students as Kindle ebooks. Students will need to download the free Kindle app. If students prefer a physical book, they should buy a copy or get it through their library. Schools must install and allow student access to the resources listed here, in order for a student to participate in the course. Please see software manufacturers' websites for further information and system requirements. In addition to VHS system requirements: Hardware used: internal/external speakers or headphones, specific URLs accessed: multiple addresses at domain "npr.org"

Course Description: This course takes students into the world of music as a listener and a writer. Students will explore how to listen to music, how to write about what they are hearing, and how to analyze and appreciate different styles of music. Students will be given the opportunity to listen to a wide variety of music from four stylistic areas: World Music, Jazz, Classical, and Popular Music. They will listen to many examples each week, to compare and contrast the different styles they hear. Critique will take place in formal essays, and in class discussions with the support

of peers. Resources will include interviews with various musical artists, reviews by music critics, and advice from famous composers on the “technique” of listening to music. These resources will help students to develop a common vocabulary to use when discussing and comparing each piece of music. This course will help students understand the nature of music through listening. It is not required that students read music in order to participate in this course. Literate musicians will find it enjoyable to take the time to sit back and listen actively to a wide variety of musicians. Garage band enthusiasts and students that are looking to explore new styles will find a great opportunity to explore some new musical territory.

## COMPUTER SCIENCE AND TECHNOLOGY

15 Weeks	Introduction to Computer Science Principles	Grades 10, 11, 12
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Introduction to Computer Science Principles will provide students with a survey exploration of the world of computer science and its technologies. Students will investigate the structure and function of computational systems and explore the domains and applications of the computer science field, from programming to digital media, the internet, networking, big data and cybersecurity.

Course Description: Students will begin by exploring computational systems, including hardware, software and data interpretation. They will investigate hardware and software technologies that make computers into useful tools, and consider advancements and impacts of new technology on society. Students will then study connectivity and communication on the Internet and the World Wide Web, to understand the importance and purpose of these resources and their many uses. Students will gain basic understanding of computer networking, big data and digital media, learning about implementation and functionality across these domains. Students will also investigate security concerns such as individual identity theft, mail and network hacking, virus attacks and defensive measures.

This course also features an introduction to computer programming using Scratch as a primary tool for developing interactive games, menu systems and animations. Through this experience, students will develop a general understanding of logical problem solving and algorithmic development in this friendly, object-oriented programming environment.

Throughout the course, students will be presented with a variety of challenges to address, in an effort to uncover the approach and use of technology to solve problems. Through discussion and evaluation, students will gain understanding and a true appreciation for ethical dilemmas and proper conduct in the computer science field. In the final weeks, students will explore the vast opportunities and associated skills for future careers in technology.

35 Weeks	AP <sup>®</sup> Computer Science	Grades 11, 12
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Prerequisite:

1. Algebra II

Advanced Placement (AP<sup>®</sup>) Computer Science A is designed to prepare students for the College Board's AP<sup>®</sup> Computer Science A Exam. The course curriculum covers the topics and activities of a first-year computer science course at the undergraduate level. It is designed to be engaging and motivating for the high school student.

Course Description: AP<sup>®</sup> Computer Science is a course designed to awaken and support students' problem solving skills. The course will introduce the Java programming language while emphasizing universal language techniques like syntax, semantics and readability. Students will gain mastery in programming concepts by using a subset of Java features that are covered when needed throughout the course content. This allows the student to understand and master important concepts that will apply to programming problems in many additional languages.

Students in AP<sup>®</sup> Computer Science will begin by encountering situations that involve solving problems with the use of primitive data types, methods, and control statements. Later, this inquiry will evolve into the use of Object Oriented Programming (OOP), which is today's most common and practical way to develop software.

Throughout the course, students will also grow to understand how computers process information. This understanding will deepen as students apply concepts like string manipulation, the behavior of elements in arrays and lists, and the use of external data to interact with algorithms.

The College Board's AP<sup>®</sup> Computer Science curriculum presents three hands-on laboratory practice sets that will help students synthesize course concepts. These labs will expand and secure their knowledge of programming and prepare them thoroughly for the AP<sup>®</sup> Computer Science exam.

Students enrolled in Advanced Placement VHS courses are expected to take the AP<sup>®</sup> exam, and are required to report their AP<sup>®</sup> examination scores to VHS (note: students who are failing their AP<sup>®</sup> class are not required to take the exam). Upon receipt of the student's exam score, each score will be recorded by VHS and assigned an anonymous tracking number to ensure student anonymity and confidentiality. By enrolling in an AP<sup>®</sup> VHS class, the student authorizes their school site coordinator and school administration to report AP<sup>®</sup> examination scores to VHS. Exam results will not affect the student's VHS grade or future enrollment in VHS courses.