# ONE SCHOOLHOUSE
# Course Catalog
# 2016-2017 & Summer 2016

## ONLINE SCHOOL FOR GIRLS

AP® Art History & Art History
AP® Calculus BC
AP® Computer Science A
AP® Computer Science Principles
AP® Environmental Science
AP® Human Geography
AP® Macroeconomics
AP® Microeconomics
AP® Music Theory
AP® Physics 1
AP® Physics C - Mechanics
AP® Psychology & Psychology
AP® Statistics & Statistics
AP® US & Comparative Government & Politics
Creating Tomorrow – Designing for a Digital World
Forensic Science
Introduction to Computer Programming
Introduction to Engineering
Linear Algebra
Multivariable Calculus & Differential Equations
Neuroscience

Summer Geometry
Summer Introduction to Computer Programming
Summer Review of Algebra I
Summer Writing Workshop

## ONLINE INDEPENDENT SCHOOL

AP® Chinese & Chinese V
AP® Computer Science A
AP® Environmental Science
AP® French & French V
AP® Music Theory
AP® Psychology & Psychology
AP® Spanish Literature & Culture
Advanced Spanish for Heritage Speakers
Latin Sequence: Latin I, II, III/IV, & AP®
Marine Science
Multivariable Calculus & Differential Equations
This I Believe: Activism in the Age of Disenfranchisement & Extremism

Summer Geometry
Summer Preparing for AP® Chinese
Summer Preparing for AP® Computer Science A
Summer Transitioning from Pre-Calculus to AP® Calculus BC

# Summer Courses – 2016

*Summer courses are for-credit opportunities for ambitious students to get a jump on the next academic year. Students participating in these courses should plan to devote 25-30 hours per week for eight weeks to their course. Students will receive grades and comments in these classes, which are the equivalent of year-long, high-school level courses. Because of the pacing and intensity of for-credit summer courses, there is little flexibility; students must be available and have internet access for all eight weeks of the course. For more information about summer courses and policies please see the School's website and the Summer Handbook.*

**Geometry**

*Prerequisite: Successful completion of Algebra I*

*Offered: Online School for Girls and Online Independent School*

Geometry forms the foundation for key concepts in advanced math courses. This course covers a full year of geometry in eight weeks by addressing traditional geometry topics including lines, angles, polygons, and circles. Students explore concepts directly through their own investigations, make and test conjectures about what they observe, and apply these conjectures to solve problems and create new conjectures. Multiple and varied tools—from folded paper, to straightedge and compass, to interactive geometry software—will be used for the investigations, which are designed to develop students' cooperation, problem-solving, spatial reasoning and communication skills. Assessments include multiple-choice and short-answer test questions, discussion prompts, and both group and individual projects.

**Introduction to Computer Programming**

*Prerequisite: None*

*Offered: Online School for Girls*

The goal of this course is to create an environment where students develop the skills to express their creativity in various programming languages. The course will start by introducing students to basic programming constructs and techniques using a simple but powerful drag-and-drop programming language in an animated environment. Students will then learn to create simple apps, explore a Java-like language that incorporates an electronic sketchbook with graphics and animation, and finally move on to object-oriented programming with 3D graphics. Throughout the course, students will conduct research and collaboratively investigate current issues surrounding computer science, specifically focusing on recent events involving computer science and the issues surrounding women in technology. By the end of the course, students will understand how relevant and important computer programming is in the world around them. This course prepares students for all advanced One Schoolhouse computer science courses.

# Summer Prep Programs – 2016

*Summer Prep Programs offer an opportunity for students to better transition from one level to the next, be it within a specific course or from middle to high school or from high school to college. Even better, because these programs are offered online and asynchronously (that is, not live), students can take the programs from any location with Internet access and have some flexibility in completing work. These programs are not intended to be full year or semester courses, and no course credit is given for program completion. Students and parents receive a comment from the student's teacher at the end of the program. Parents and students should be aware that program are designed so that students will be engaged in work for approximately 8-10 hours per week. And, while there is some flexibility in terms of some completion dates, students are regularly assigned to work together on group assignments and projects, which means that students must be available throughout all four weeks of the program. For more information about summer programs and policies please see the School's website and the Summer Handbook.*

## *Summer Session I – Prep Programs*

**Review of Algebra I**

*Prerequisite: Successful completion of Algebra I*
*Offered: Online School for Girls*
This four-week program is designed to review the major topics of Algebra I. Topics include solving linear equations, equations of lines, solving quadratic equations by factoring, completing the square and quadratic formula, solving rational equations, solving radical equations, solving systems of equations, absolute value, inequalities, and word problems. In addition, students will preview material for the next levels of mathematics to prepare for either Geometry or Algebra II. Students will use various tools to explore the concepts and to collaborate and communicate with their teacher and classmates.

**Summer Writing Workshop**

*Prerequisite: None*
*Offered: Online School for Girls*
The purpose of this four-week program is to help students write with confidence, clarity, and purpose in all of their school work, and to prepare for the rigors of high school level writing. It is an appropriate program for rising high school students and students who struggled with writing components of a ninth grade level English course. Assignments will emphasize the writing process – planning, drafting, and revising. Students will also practice some grammar to increase their understanding of the structure of language as well as to learn ways to use it as a tool for clarity, style, and meaning.

## *Summer Session II – Prep Programs*

**Preparing for AP® Chinese**

*Prerequisite: Successful completion of Chinese III*
*Offered: Online Independent School*
This program is designed for students who will be entering AP® Chinese in the fall and would like a review to be sure they are prepared for the rigor of the AP® program. This class will review and reinforce the four language skills – listening, speaking, reading, and writing. Particular attention will be paid to applying cohesive devices and connectors in writing; to reviewing present, past and future tenses; and on refining pronunciation of the language. Student work will include individual and group activities, regular interaction with the teacher and other students, and weekly assessments to gauge progress before moving on to new material.

**Preparing for AP® Computer Science A**

*Prerequisite: Successful completion of an One Schoolhouse computer programming course or permission from the administration*
*Offered: Online Independent School*
This program is designed for the student who has little or no computer programming experience but plans to enroll in an advanced One Schoolhouse programming classes, including AP® Computer Science A and Creating Tomorrow. Students will explore four key programming concepts – graphics, conditionals, iterations, and modularity. Each section will begin with introductory material, after which students will progress to a variety of open and creative programming exercises that resemble the rigor of the AP® program.

**Transitioning from Pre-Calculus to AP® Calculus BC**

*Prerequisite: Successful completion of Pre-Calculus*

*Offered: Online Independent School*

This program is designed for students who have completed a regular Pre-Calculus course and would like to be certain that they are prepared to continue their study of mathematics in the AP® Calculus BC course rather than in AP® Calculus AB. Topics will include four units that are not always included in Pre-Calculus: sequences and series, polar/parametric functions, vectors, and limits. By the end of this program, students will feel a comfort level with these topics and will be prepared for success in AP® Calculus BC.

# School Year Courses – 2016-2017

## Art Courses

**AP® Art History and Art History** – *see below under Social Science Courses*

**AP® Music Theory**

*Prerequisite: Ability to read at least one clef of music and proficiency in an instrument or voice*
*Offered: Online School for Girls and Online Independent School*
AP® Music Theory will introduce advanced concepts of music theory to students. The aim of this course is to improve students' performance, aural, analytical, and composition skills. AP® Music Theory is an intensive, fast paced course that touches on aspects of melody, harmony, texture, form, musical analysis, and composition. This course also includes an aural section of sight-singing, melodic and harmonic dictation, and listening examples. Each student will be required to compose and perform original compositions, both as an individual and in a group setting. All students enrolled in this course will be prepared to take the Advanced Placement exam in the spring. Yet AP® Music Theory is not just about the exam; the student will experience a growth in her performance skills and all around musicianship. This is a crucial course for anyone looking to pursue music professionally or for anyone who has a passion in music and wants to explore her interest.

**Creating Tomorrow - Designing for a Digital World** – *see below under Computer Science Courses*

## Computer Science Courses

*One Schoolhouse offers a complete four-year programming sequence, but students are not required to take these courses in the listed order.*

**AP® Computer Science A**

*Prerequisite: Successful completion of a One Schoolhouse computer programming course or permission from the administration*
*Offered: Online School for Girls and Online Independent School*
The AP® Computer Science course will introduce the key concepts and techniques of object-oriented programming in Java. The analytic, critical-thinking, and problem-solving skills developed in this course will transfer to programming in other languages on a variety of platforms. This course is designed with the idea that programming should be fun, engaging, and intuitive. Students will work creatively and collaboratively with their classmates and develop a solid foundation from which to launch into a wide range of computer science areas. In today's world, having an understanding of programming concepts as well as the ability to approach problems with a "programmer's eye" have become essential skills for students and professionals. Students taking this course will be well prepared for the AP® Computer Science A Exam in May.

**AP® Computer Science Principles**

*Prerequisite: None, prior programming experience recommended*
*Offered: Online School for Girls*
Computer science and computing technologies are everywhere, and used in just about every imaginable occupation. This collaborative, learner-centered course will investigate the "big ideas" found in our digital world such as the creativity in finding solutions to authentic problems, how data and information are used to forecast events and predict behaviors, and the global impacts of technology and the Internet. Students will explore the current state of technology and its role in our everyday lives, and develop their skills in computational thinking, logical reasoning, and describing processes through algorithms and pseudocode. They will create computer programs that serve useful functions, explore the different means of representing information digitally, and discover new knowledge through the use of large data sets. Finally, students will demonstrate their learning by creating a portfolio of their work for submission to the College Board.

**Creating Tomorrow - Designing for a Digital World**

*Prerequisite: Successful completion of a One Schoolhouse computer programming course or permission from the administration*
*Offered: Online School for Girls*
The importance of communication in the digital world can't be underestimated. In this course, students will enhance their communications and technology skills by using the design process to create software products relevant to the digital age in

which we live. Combining software engineering and entrepreneurship, students will create digital products using a variety of software tools and computer languages, and learn how to brand and market these products and services such as games, web sites, videos, mobile applications, etc. The design and development of their products will require study in market research, conceptual design, prototype development, product implementation and testing, as well as branding and social media marketing strategies for the final product launch. Students will have a choice in selecting topics or issues of interest and be able to pursue their interests in depth. By the end of the course, students will have developed a portfolio of their work and a digital product that they may continue to develop and market forward.

**Introduction to Computer Programming**
*Prerequisite: None*
*Offered: Online School for Girls*
The goal of this course is to create an environment where students develop the skills to express their creativity in various programming languages. The course will start by introducing students to basic programming constructs and techniques using a simple but powerful drag-and-drop programming language in an animated environment. Students will then learn to create simple apps, explore a Java-like language that incorporates an electronic sketchbook with graphics and animation, and finally move on to object-oriented programming with 3D graphics. Throughout the course, students will conduct research and collaboratively investigate current issues surrounding computer science, specifically focusing on recent events involving computer science and the issues surrounding women in technology. By the end of the course, students will understand how relevant and important computer programming is in the world around them. This course prepares students for all advanced One Schoolhouse computer science courses.

## Foreign Language Courses

*One Schoolhouse offers AP® and advanced level language courses in Chinese, French and Spanish. We also offer the complete Latin sequence.*

**AP® Chinese**
**Chinese V**
*Prerequisite: Successful completion of Chinese III and the One Schoolhouse "Preparing for AP® Chinese" summer course, or Chinese IV and instructor permission*
*Offered: Online Independent School*
AP® Chinese will provide deeper understand and broader application into Chinese language and culture for intermediate Chinese learners. This course will focus on applying Chinese language and cultural skills in real-world problem situations, and will provide the opportunity to experience a variety of topics in Chinese history, geography, music and arts, literature, daily life, and national and global issues. Almost all of the course is taught in Chinese. This course will apply a student-centered diagnostic learning approach. Authentic resources in both oral and written Chinese will include recorded lectures, online discussion and debate, TV and video clips, Chinese newspaper articles, and instructions from Chinese products. Group work, one-to-one extra help, and a variety of engaging activities and experiential projects are employed in the course to meet the individual needs of students. All students enrolled in this course will be prepared to take the Advanced Placement exam in the spring. Students may select the AP® or Chinese V track in this course. AP® students will be expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP® exam in the spring. Chinese V is recommended for students who have completed four or more years of Chinese but do not want to prepare for the AP® exam.

**AP® French**
**French V**
*Prerequisite: Successful completion of French IV, or French III and immersion experience*
*Offered: Online Independent School*
In this course, students will continue to refine their grammar skills, expand their vocabulary, and improve their French communication and comprehension skills, both verbal and written, while gaining as much cultural knowledge as possible about the Francophone world. The goal is for the student to be able to interpret and discuss historical, cultural, and current event topics pertaining to the various different communities that exist in the Francophone world. Students will analyze, interpret, and synthesize information from various sources such as news articles, literary works, songs, video clips, films, documentaries, advertisements, personal emails, and voice messages. Students are also encouraged to express informed personal opinions and conclusions regarding the material to which they are exposed. They will compare and contrast different

cultural practices within the Francophone world as well as observe similarities to and differences between the Francophone world and their own. Students will engage with French language and culture through creative and collaborative activities. Students may select the AP® French or French V track in this course. AP® students will be expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP® French Language and Culture exam in the spring. French V is recommended for students who have completed four or more years of French but do not want to prepare for the AP® exam.

**AP® Spanish Literature and Culture**
**Advanced Spanish Literature and Culture for Heritage Speakers**
*Prerequisite: Successful completion of least threes years of high school Spanish or proficient heritage speakers interested in literature, art and history; Instructor recommendation.*
*Offered: Online Independent School*
The AP® Spanish Literature and Culture course provides a college level survey of texts from Peninsular, Latin American and U.S. Hispanic authors. Students complete the readings detailed on the required reading list for the AP® Spanish Literature and Culture course provided by the College Board and learn to analyze the works, both within their social and historical context and as expressions of major literary movements. By reading and interpreting the works, students will build an understanding of form, structure, theme and literary devices and how each of these enhances the understanding of literary texts. The course is organized around the six themes designated by the AP® curriculum framework: Societies in Contact, the Construction of Gender, Time and Space, Literary Creation, Interpersonal Relationships and the Dual Nature of Being. In this case, the reading list will be divided thematically so that each work will be considered first through the lens of a specific theme and re-examined throughout the course from other thematic perspectives. Many of the works can be examined from the perspective of multiple themes. Students will have an opportunity to demonstrate proficiency in the interpretive (reading and listening comprehension), interpersonal, and presentational modes (speaking and writing). Students will be encouraged to demonstrate proficiency in the five goal areas (communication, cultures, connections, comparisons and communities) through analysis, discussion and comparison of literary works on the required reading list, and through additional readings as determined by the instructor. As students build their skills, particularly critical reading of and analytical writing about the literary works, they will also build an understanding and appreciation of the rich variety of the literature of the Spanish-speaking world and of the value of literature as an expression of Hispanic cultures. The course will be conducted entirely in Spanish. Students may select the AP® or non-AP® track in this course. AP® students will be expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP® exam in the spring. Advanced Spanish Literature and Culture for Heritage Speakers is recommended for students who are fluent in Spanish or are heritage Spanish speakers but do not want to prepare for the AP® exam.

**Latin Sequence: Latin I, II, III/IV, and AP®**

**Latin I**
*Prerequisite: None*
*Offered: Online Independent School*
Latin I is intended for students who have not previously studied Latin. The course will develop competencies in reading and interpreting, oral expression and aural comprehension. Students will learn the basic components and structures of Latin that will allow them to develop basic reading strategies, which they will use to build critical-thinking skills. Upon completion of this course, students will have acquired proper pronunciation, essential grammar and vocabulary to be able to understand and read short passages; the ability to engage in simple verbal exchanges; and a greater knowledge of English vocabulary and grammar. Learning Latin is also about discovering connections and relationships between ancient and contemporary languages, cultures, and influential ideas. Latin I students will study Roman culture and history so they can examine the indebtedness of modern society to the Roman world, from legendary heroes to myths, gods, and politics. Students will take quizzes and have tests, but they will also write stories, sing songs, play games, and work together on short research projects to further understand how their developing knowledge of Roman culture applies to their own lives.

**Latin II**
*Prerequisite: Successful completion of One Schoolhouse's Latin I course or Latin II placement test*
*Offered: Online Independent School*

The Latin II course continues the study of the language, culture and history of the ancient Romans. By the end of the year students will have gained extensive experience in various competency areas of the language: reading and interpreting, oral expression and aural comprehension. Students will continue to learn and practice linear-reading strategies that build critical thinking skills. At every step of the way students expand their English vocabulary through the study of Latin word roots. In addition, significant time is devoted to the study of areas of Roman culture and history as presented through the products of the Romans such as art, architecture, and engineering techniques. Students also examine evidence of Roman daily life and compare the ancient Roman customs to those of the modern world. Every unit of Latin II incorporates linguistic and cultural/historical material. Many of the unit assessments are collaborative projects with personalized pathways requiring that students work together to create linguistic, artistic and creative materials that demonstrate their understanding of the unit content.

**Latin III/IV**

*Prerequisite: Successful completion of One Schoolhouse's Latin II course or Latin III placement test*
*Offered: Online Independent School*

Latin III/IV is a rigorous class that will prepare students to enroll in any AP® Latin course, as they comprehend increasingly grammatically and culturally challenging texts. After reading stories of famous Romans at the intermediate level of Latin, students will collaborate in reading authentic Latin literature from a variety of possible authors such as Livy, Martial, Catullus, Sulpicia, Ovid, Caesar, Cicero, and Vergil on such topics as love, politics, war, leadership, marriage, the family, friendship, Roman values, mythology, and religion. Students will read selected English translations from Greek and Roman authors in order to gain a wider understanding of Roman culture and literature, to provide some background for the Latin readings, and to connect with our contemporary world. Students will work towards developing four basic competencies: reading and comprehending Latin poetry and prose, translating Latin as literally as possible, gaining a deeper understanding of the historical context of literary works, and analyzing Latin texts as works of literature. Students will review basic grammar throughout the year and will learn more complex grammatical and syntactical structures, such as indirect statement, participles, the ablative absolute, the gerund and gerundive, and various uses of the subjunctive. Students will study literary devices and meter and learn how to analyze and interpret Roman literature as a creative genre, while gaining deeper contextual knowledge of the social and political conditions of the Republic and early Empire. Finally, students will write essays that are supported with evidence from a Latin text, demonstrate their knowledge of Roman perspectives in a variety of ways, as well as engage in discussions about the connections between Roman culture and modern cultures today.

**AP® Latin**

*Prerequisite: Successful completion of at least three years of Latin*
*Offered: Online Independent School*

AP® Latin students will be challenged to read and analyze passages of Caesar's *Gallic Wars* and Vergil's *Aeneid*. The emphasis of the course will be on reading and understanding the works of these two authors, as well as diving into the historical context of both works. We will also look at literary devices and discuss how each author uses Latin and to what effect. Students will practice these analytical skills not only on the proscribed passages, but also on sight passages from various authors with weekly assignments. We will compare the writings of Vergil and Caesar to modern authors and explore the effect these authors have on our world today in class discussions. Students will prepare translations and essays under time constraints similar to those on the AP® exam. Additionally, students will peer edit essays to help strengthen their writing and analysis skills. All students enrolled in this course will be thoroughly prepared to take the Advanced Placement exam in the spring.

## Math Courses

**AP® Calculus BC**

*Prerequisite: Successful completion of prior pre-calculus or calculus course covering natural logarithms, series/sequences, parametric/polar functions, vectors, and limits*
*Offered: Online School for Girls*

The AP® Calculus BC course is a standard course in the calculus of a single variable. The goal is to teach conceptual reasoning, enabling students to present a solution algebraically, geometrically, numerically or verbally. Emphasis is placed not only on a clear understanding of the concepts, but also on their applicability in real world situations. All of the topics in the Advanced Placement BC syllabi are covered, as well as additional topics as time permits. Major topics include limits, continuity, derivatives and applications, integrals and applications, first order linear differential equations, inverse

trigonometric functions, transcendental functions, infinite series, Taylor polynomials, vectors, parametrically defined functions, and polar coordinates. This student-centered course will feature discussions, reflections, and projects that will help students to master the course material in an engaging way. Students enrolled in this course will be thoroughly prepared to take the Advanced Placement exam in the spring.

**AP® Statistics**
**Statistics**
*Prerequisite: Successful completion of Algebra II*
*Offered: Online School for Girls*
AP® Statistics will help students develop strategies for collecting, organizing, analyzing, and drawing conclusions from data. Each student will be expected to learn how to articulate methodology, data description, and conclusions and to provide constructive comments on reports by classmates. Much of the knowledge learned in this course will come through experiential activities that challenge students to design, administer, and tabulate results from surveys and experiments. The students will often work in small collaborative groups to explore problems and share ideas. Active participation, in the form of individual and group projects, peer review of student work, and discussion board conversations, are key to student success. Students may select the AP® or non-AP® track in this course. AP® students will be expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP® exam in the spring.

**Linear Algebra**
*Prerequisite: Successful completion of AP® Calculus AB or equivalent*
*Offered: Online School for Girls*
Linear algebra is the study of vectors, the spaces in which they live, and linear mappings between those spaces. It gives us a powerful new way to think mathematically, and it has many applications in science, engineering, economics, and any field in which multiple variables interact in ways that can be modeled by systems of linear equations. It's therefore a required and very useful subject in college for many science and engineering majors. This yearlong course will cover a typical one-semester college linear algebra curriculum, with topics including matrix algebra, vector spaces, eigenvalues and eigenvectors, and applications to differential equations. In the sequence of standard math courses, linear algebra can be studied either before or after multivariable calculus. It's a great fit for the student who has completed AP® Calculus AB or BC, who is passionate about challenging herself to think in new ways, and who wants to increase her ability to tackle problems in the real world.

**Multivariable Calculus and Differential Equations**
*Prerequisite: Successful completion of AP® Calculus BC or equivalent*
*Offered: Online School for Girls and Online Independent School*
Multivariable Calculus and Differential Equations will cover a number of topics beyond the AP® Calculus BC curriculum, including calculating volumes by using shells, surfaces of revolution, and centers of mass and centroids. The course also explores topics that are studied in a typical college level third semester calculus course, including vectors and vector valued functions, differentiation in several variables, optimization in several variables, multiple integration, and line and surface integrals. Moving onto Differential Equations, students begin solving exact first-order equations, solving second order homogeneous and nonhomogeneous linear equation, and exploring applications to various scientific fields. This course will feature discussions, projects, and other activities that will help students to develop their advanced math skills in a collaborative and creative way.

## Science Courses

**AP® Environmental Science**
*Prerequisite: Successful completion of one year of high school laboratory science or instructor permission*
*Offered: Online School for Girls and Online Independent School*
AP® Environmental Science will provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them. Humans have made an enormous impact on the Earth, particularly in the past few decades, with our advances in technology, rapid population growth, and excessive energy use. Our own survival depends on developing practices that will achieve sustainable systems that are both economical and ecologically friendly. Therefore, much of the course will

consist of ethical discussions and collaborative projects designed to probe how different cultures and social structures affect the environment, and to explore potential solutions to today's environmental issues. Students in AP® Environmental Science will engage collaboratively to investigate the real-world problems that face our environment today such as biodiversity loss, energy conservation, and climate change. They will study not only our environment but also work collaboratively to understand our role in it.

**AP® Physics 1**

*Prerequisite: Successful completion of Algebra II*

*Offered: Online School for Girls*

AP® Physics 1 is an algebra-trigonometry based, introductory college level physics course. The course is based on first semester introductory college physics and is designed for those planning to enter into life science or pre-med programs in college. The goal of the course is to develop in the student the understanding of physics through inquiry-based investigations. Students will explore principles of Newtonian mechanics, work, energy, power, waves, sound, and simple circuits. Additional supplemental topics will be covered that will build understanding of the primary College Board curriculum. Developing the ability to reason qualitatively and quantitatively is a principal focus. Those skills will be developed through the use of modeling, graphing, diagramming, unit analysis, symbolic algebra, and data analysis. Laboratory exercises will be used to enhance the investigation of each topic. This course is intended to prepare students for the College Board AP® Physics 1 Exam.

**AP® Physics C - Mechanics**

*Prerequisite: Successful completion of Calculus*

*Offered: Online School for Girls*

AP® Physics C Mechanics is a calculus based, college level physics course. The course is especially designed for those students planning to enter college programs such as engineering or physical sciences. The goal of the course is to develop in the student the understanding of physics through inquiry-based investigations. Students will explore principles of Newtonian mechanics, work, energy, power, systems of particles, linear momentum, circular motion, rotation, oscillations, and gravitation. Differential and integral calculus is used during the course. Additional supplemental topics will be covered that will build understanding of the primary College Board curriculum. Developing the ability to reason qualitatively and quantitatively is a principal focus. Those skills will be developed through the use of modeling, graphing, diagramming, unit analysis, symbolic algebra and calculus, and data analysis. Laboratory exercises will be used to enhance the investigation of each topic. This course is intended to prepare students for the College Board AP® Physics C Mechanics Exam.

**Forensic Science**

*Prerequisite: Successful completion of one year of high school laboratory science or instructor permission*

*Offered: Online School for Girls*

Forensic Science will examine the application of science to the criminal and civil laws enforced by the criminal justice system. Students will explore the science of criminology by using a combination of science disciplines, including biology, chemistry, physics, geology, and computer technology. Students will learn to differentiate between actual techniques and some of those portrayed on popular television shows and will also evaluate current procedures used by real crime labs to understand some of the limitations of the law, police, and forensics science. Throughout the year, students will examine scientific techniques behind the analysis of physical and chemical evidence, toxicology, DNA fingerprinting, fire and explosives, glass, bones, handwriting and document analysis, and other relevant pieces of evidence. Simulated crime and accident scenes will be investigated, and as evidence is collected and analyzed, students will develop observation skills and deductive reasoning. The course will also include a study of the variety of careers in forensic science. This exploration will be completed through a mixture of laboratory exercises, class discussions and projects, online simulations and games, and analysis of representation of forensic science in the media.

**Introduction to Engineering**

*Prerequisite: Successful completion of one year of high school laboratory science or instructor permission*

*Offered: Online School for Girls*

Engineers create things. They are the designers of the modern world. The works they create drive society forward. Introduction to Engineering will introduce students introduced to many areas of engineering, including: civil/structural, chemical, mechanical, electrical, and biomedical engineering. In addition, students will learn the engineering design process

used by practicing engineers. Specific topics in this course will include structural integrity with egg contraptions, chair and bridge building projects, engineering ethics, heat transfer and home heating, energy transmission, and alternative energy research with specific case studies in solar and fuel cell cars. This course will assist students to develop an array of specific skills including: applying the engineering design process to a specific problem; working effectively and collaboratively with other members of the class; demonstrating originality and inventiveness in your work; reflecting critically in order to improve creative efforts in problem solving; and viewing success as a cyclical process. Through active problem solving in the context of specific case studies, this course addresses concepts and skills relevant to a career in engineering. A culminating project will require students to apply much of what they have learned in the course.

**Marine Science**

*Prerequisite: Successful completion of one year of high school laboratory science or instructor permission*
*Offered: Online Independent School*
Marine Science will introduce students to oceanography through a review of earth science concepts, investigation of physical and chemical ocean systems, and the exploration of marine organisms. Major topics of study will include the anatomy and behavior of marine organisms, the ecology of marine habitats, and the role of climate change in both marine and global systems. There are three goals for the course: 1) to develop a solid knowledge base and understanding of marine ecological systems, 2) to integrate that knowledge base into practical applications of science that affect students' world and futures, and 3) perhaps most importantly, to foster critical thinking skills and a keen understanding of the scientific process necessary to become well-informed and scientifically aware citizens, whether students' futures directly involve marine science or not.

Coursework will include a variety of methods and mediums, including but not limited to: virtual and at-home laboratory exercises; scientific literature analysis; reading and video assignments; and research using online journals and current oceanographic data. This work will be largely collaborative as students engage with the teacher and with their classmates on projects and labs. There will be a significant emphasis on the application of creativity and innovation in dealing with environmental challenges.

**Neuroscience**

*Prerequisite: Successful completion of one year of high school laboratory science or instructor permission*
*Offered: Online School for Girls*
A spongy, three pound mass of tissue – the brain – is the most complex organ of the human body. This single organ controls every aspect of the body, ranging from circulation and appetite to emotion and memory. Because the brain shapes our thoughts, beliefs, hopes, dreams, and imaginations, the brain is what makes us human. By the end of the first semester, students will understand the structure of the brain and how the brain senses, thinks, behaves, and creates memories for learning and language, as well as how the environment (stress, diet, exercise and time) impacts the brain. We will also explore brain diseases, disorders, and treatments. Armed with this solid foundation in neuroscience, students will spend the second semester learning to think like doctors. In this project-based class, students will engage in individual research projects and seminar-style problem solving. Utilizing neuroscience as a foundation to explore any human biology topic, students will be guided through a self-designed, long-term research project.

Neuroscience is a foundational topic for all health-care professionals. This course is designed for students who are considering college majors in a medical or health related field, such as medicine, psychology, occupational therapy, neural or biomedical engineering, public health, lab neurobiology research, radiology or imaging, speech-language pathology, or kinesiology.

## Social Science Courses

**AP® Art History**

**Art History**

*Prerequisite: Successful completion of one year of high school history*
*Offered: Online School for Girls*
Students enrolled in the AP® Art History course will examine and critically analyze major forms of artistic expression from a variety of cultures spanning 32,000 years of art. Beginning with global prehistory and ending with global contemporary art,

students will consider influential forces like patronage, politics, class, belief, gender, and ethnicity in their analysis of art forms. Students will become active participants in the global art world, engaging with its forms and content, as they experience, research, discuss, read, and write about art, artists, art making, and responses to and interpretations of art. By investigating a specific image set of 250 works of art characterized by diverse artistic traditions from prehistory to the present, the course fosters an in-depth, holistic understanding of the history of art from a global perspective. Students may select the AP® or non- AP® track in this course. AP® students will be expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP exam in the spring.

**AP® Human Geography**

*Prerequisite: Successful completion of one year of high school history*

*Offered: Online School for Girls*

AP® Human Geography 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. Students will analyze the interplay between geography and humanity while they investigate topics such as population growth and migration; cultural patterns and processes; political organization of space; agriculture; industrialization and economic development; cities and urban land use; and the environmental impact of human actions. They will learn about the methods and tools geographers use in their science and practice, which help geographers answer such diverse questions as: What do clustering patterns of voting districts in a state tell one about the population? Why do most North Americans practice Christianity? And, what has changed in the last ten years that has caused the oil industry to not be able to keep up with demand? The course will include discussions, collaborative projects, free-response questions and traditional tests and quizzes. The courses is intended for students in grades tenth, eleventh, or twelfth grade.

**AP® Macroeconomics**

*Prerequisite: Successful completion of Algebra II*

*Offered: Online School for Girls*

AP® Macroeconomics will introduce students to major economic issues such as basic market analysis, the causes of the cycle of economic growth and recession, the problems of inflation and unemployment, the causes and consequences of federal budget deficits, and the causes and effects of international trade imbalances and currency fluctuations. The impact of fiscal and monetary policies are analyzed as are the debates surrounding the proper implementation of each. This course will involve extensive reading, problem-solving exercises, online discussions, quizzes and tests, and research and writing about contemporary macroeconomic issues. Strong reading, algebra, and analytical skills are necessary for success, as is strong motivation. AP® Macroeconomics will prepare students to become informed and thoughtful and will thoroughly prepare students to take the Advanced Placement exam in the spring. AP® Macroeconomics is recommended for juniors and seniors.

**AP® Microeconomics**

*Prerequisite: Successful completion of Algebra II*

*Offered: Online School for Girls*

AP® Microeconomics is a course that examines how individuals (such as consumers and producers) make decisions and how these decisions affect our everyday lives. Topics discussed include the forces of supply and demand, costs of production, consumer choice, and behavioral economics, amongst others. Throughout the course, students will examine various models that are used to conceptualize how our economy operates and will explore the role that government plays in a given economy. As an online, college-level course, significant emphasis is placed on independent work and individual accountability. Students will complete collaborative projects, group discussions, problem sets, quizzes, and tests. The curriculum is developed to prepare students for the AP® Microeconomics examination in May. Strong mathematical reasoning skills and an interest in finance, business, or government will aid students in this course. AP® Microeconomics is recommended for juniors and seniors.

**AP® Psychology**

**Psychology**

*Prerequisite: Successful completion of eighth grade*

*Offered: Online School for Girls and Online Independent School*

AP® Psychology and Psychology will introduce students to the systematic and scientific study of the behavior and mental processes of human beings and other animals. In this course, students will be presented with the psychological facts, principles and phenomena contained within the major branches of psychology. The course will include a balanced examination of: Biological Bases of Behavior, Sensation and Perception, States of Consciousness, Learning, Cognition, Motivation and Emotion, Developmental Psychology, Personality, Testing and Individual Differences, Abnormal Psychology, Treatment of Psychological Disorders and Social Psychology. Students will develop a thorough understanding of the many subfields contained within psychology and the connections between them. In addition, students will also be exposed to the history, methodology and ethical practices associated with psychological research. Upon completion of this course students will recognize the significance of psychology and it practical applications upon the world around them. Students will engage collaboratively with their classmates in projects and real-world discussions. Students may select the AP® or non- AP® track in this course. AP® students will be expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP® exam in the spring. Non-AP® students will demonstrate mastery through projects and alternative assessments.

**AP® US Government & Politics and AP® Comparative Government & Politics**

*Prerequisite: Successful completion of one year of high school history*

*Offered: Online School for Girls*

AP® Government and Politics is a yearlong course that provides students with an in-depth understanding of the American government as well as various political systems around the world. The fall semester covers AP® US Government and Politics. Students will learn how the American government was founded, how the electoral process works, who votes and why, and how the various branches function. Special attention will be given to how the different agencies within the government interact, and how these agencies and their policies affect the daily lives of Americans. The spring semester covers AP® Comparative Government and Politics, which takes an in-depth look at six different states: Iran, Nigeria, China, Russia, Mexico, and Great Britain. In addition to learning how to conduct proper comparative studies, students will analyze how these different states function, both as independent states and as part of the global community. Upon completion of this course, students will have a thorough understanding of some of the major political systems across the world, which will make it easier to comprehend how our world evolves and functions. Students will be prepared for both AP® exams.

**This I Believe: Activism in the Age of Disenfranchisement and Extremism**

*Prerequisite: Successful completion of one year of high school history*

*Offered: Online Independent School*

What do you believe? As the issues of today crescendo into crises, we have an ethical obligation to understand why individuals experience disenfranchisement, why extremism is on the rise, and how the two are linked. Through the lenses of culture, race, class, religion, and art, we will explore the role that activism plays in the concepts of global citizenship and justice. As we define what we believe, we will practice empathy and learn to voice our own perspectives without silencing those of others. We will tackle what it means to be a global citizen in the 21st century, what challenges disenfranchised people face today, how historical factors have shaped extremists' responses to our challenges, the role of culture in how challenges are addressed, and what we, as global citizens, should do. Both the students and the teacher will provide topics for class discussions, and students will develop competencies in current events analysis, research, writing, and discussion.

## Independent Study

*Prerequisite: Recommendation from a school administrator at a student's permanent school*

*Offered: Online School for Girls and Online Independent School*

Want to take a deep dive into your favorite subject but need some teacher support? One Schoolhouse will arrange for a facilitator for this year-long, student-designed independent study in a core or elective subject. The teacher and student will work collaboratively to design a syllabus, establish pacing, and determine metrics by which progress will be measured. The student will produce a culminating portfolio, which might include exemplars of content and skills mastery as well as a capstone independent research. Please contact Karen Douse at karen.douse@onlineschoolforgirls.org for more information on independent studies through One Schoolhouse.