

Student Course Catalog: 2018-2019

Welcome to the One Schoolhouse 2018-2019 Course Catalog! At One Schoolhouse, we offer a wide variety of courses where students can select from co-ed or girls-only sections and AP or non-AP learning experiences. All of our courses are competency-based. We believe that online learning is essential for college readiness and work to ensure that students learn not only their course material, but also to engage constructively in a diverse and changing world and to gain academic maturity. You can navigate to the course descriptions by clicking the links below or by scrolling through the catalog, which is organized by discipline. Meet the teachers for these courses by visiting our website. If you have any questions, don't hesitate to contact us at 202-618-3637

Summer 2018

Algebra II

Geometry

Introduction to Computer Science

Pre-Calculus

US History

World Religions

Fall 2018

Abnormal Psychology

Business and Entrepreneurship

Civics, Culture, and Intersectionality

Creating Tomorrow: Computer Science by Design

Engineering, Design, and Robotics

Gender and Sexual Identity in America

2018-2019 School Year

Abnormal Psychology

AP® Art History

AP® Calculus AB

AP® Calculus BC

AP® Chinese Language and Culture

AP® Computer Science A

AP® Computer Science Principles

AP® English Literature and Composition

AP® Environmental Science

AP® French Language and Culture

AP® Human Geography

AP® Latin

AP® Macroeconomics

AP® Microeconomics

AP® Music Theory

AP® Physics 1

AP® Physics C - Mechanics

AP® Psychology

AP® Spanish Literature & Culture

AP® Statistics

AP® US Government & Politics and AP® Comparative

Government & Politics

Art History

Business and Entrepreneurship

Chinese I

Chinese II

Chinese III

Chinese III/IV

Chinese V

Civics, Culture, and Intersectionality

Creating Tomorrow: Computer Science by Design

Gender and Sexual Identity in America

Engineering, Design, and Robotics

Forensic Science

French V

Independent Study

Introduction to Computer Science

Latin I

Latin II

Latin III/IV

Linear Algebra

Marine Science

Multivariable Calculus & Differential Equations

Neuroscience

Psychology

Spanish V: Literature & Culture

Statistics

Summer Courses – 2018

Summer courses are intensive for-credit opportunities for ambitious students. Students participating in these courses should plan to devote 25-30 hours per week for all eight weeks to their course. Students 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, students must have the ability to login and complete work for their course daily; students must be available and have internet access from June 11th until August 3rd – this is nonnegotiable! See our calendar [here](#).

Algebra II

Prerequisite: Successful completion of Algebra I and Geometry

Offered: Co-ed; Full-year course credit

Algebra II forms the foundation for key concepts in advanced math courses. This course covers a full year of Algebra II in eight weeks by addressing algebraic functions and equations of lines and higher order polynomials; exponents and logarithms; rational expressions; absolute value; piecewise; and step. The course ends with an introduction to trigonometry beyond the right triangle. 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. Assessments include tests and quizzes, discussion prompts, and group and individual projects. By the end of the course, students will have gained proficiency in critical thinking, pattern recognition, graphing, transformations, and communication.

Geometry

Prerequisite: Successful completion of Algebra I

Offered: Girls only and Co-ed; Full-year course credit

Geometry forms the foundation for key concepts in advanced math courses. This fast-paced course covers a full year of Geometry in eight weeks by addressing traditional geometric 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. Students use multiple and varied tools—from folded paper, to straightedge and compass, to interactive geometry software—for the investigations. These are designed to develop students' cooperation, problem-solving, spatial reasoning and communication skills. Assessments include quizzes and tests, discussion prompts, and both group and individual projects. By the end of the course, students will have gained proficiency in logic, pattern recognition, spatial reasoning, and tech tools.

Introduction to Computer Science

Prerequisite: None

Offered: Co-ed; Full-year course credit

The goal of this course is to introduce students to some of the major areas of computer science as well as to develop their programming skills to produce useful solutions and creative artifacts. Throughout the course, students conduct research and investigate current issues and innovations enabled by the application of computer science such as virtual reality, robotics, cloud computing, cybersecurity, the Internet of Things, and ecommerce. Students learn fundamental computer programming concepts using a simple but powerful block-based programming language to implement methods, functions, parameters, arguments, if-else statements, and loops in a creative and animated environment. Students then explore a Java-like language that incorporates an electronic sketchbook with graphics, animation, and object-oriented programming concepts, while utilizing a more traditional, text-based coding methodology. This course prepares students for all other One Schoolhouse computer science courses.

Pre-Calculus

Prerequisite: Successful completion of Geometry and Algebra II or equivalent

Offered: Co-ed; Full-year course credit

This course covers a full year of pre-calculus in eight weeks by addressing the algebraic and trigonometric concepts that lay the foundation for AP Calculus AB or BC. Students graph and solve polynomial, rational, exponential and logarithmic functions and apply these functions to model the relationship between different quantities in the real world. They explore the unit circle, solve trigonometric equations, and study abstract applications by proving trigonometric identities. Students then examine and apply algebraic representations of matrices, vectors, sequences and series, and conic sections by understanding the patterns and behaviors associated with these concepts. The course concludes with an introduction to calculus through limits. Students preparing for AP Calculus BC also have the option of studying polar coordinates, parametric functions, and derivatives. Students demonstrate mastery through traditional and alternative assessments, discussion prompts, reflection on their learning, group collaboration, and individual projects.

World Religions

Prerequisite: Successful completion of one year of high school social science or permission from the administration

Offered: Co-ed; Full-year course credit

This course is a full year social science credit examining the major religious traditions of the world. In the first half, students explore the history and beliefs of the major religions of the world today – Buddhism, Hinduism, Islam and Judeo-Christianity, – before examining the intersection of cultural, political, and socio-economic forces that influence and are influenced by faith traditions. With this foundation, in the second half students take deep dives independently and collaboratively into faith practices of their choosing, such as New Age Religions, Paganism, Shinto, Sikhism, Taoism, Zoroastrianism, or the beliefs of indigenous peoples of Africa, the Americas, or Australia. Students demonstrate understanding through critical analysis, research papers, and alternative assessments.

US History

Prerequisite: Successful completion of one year of high school social science or permission from the administration

Offered: Co-ed; Full-year course credit

This course is a full year social science credit surveying the history of the United States of America. The course begins with an examination of America before Columbus. Having established an understanding of how Native Americans managed and used the land, the course turns to European conquest and colonial America, including how the stage was set for a plural and diverse modern America. The heart of the course centers around the themes of the American Revolution; the rise of democracy, the Republic, and the Constitution; the Civil War and Reconstruction; and how territorial expansion and industrialization laid the foundation for the movements and conflicts of the 20th and 21st centuries. In order to develop a broad understanding of continuity and change in American history, students build a contextual understanding of the major events within each era while exploring political, social, cultural, economic, and religious trends in the United States. Through critical analysis, research and writing; collaborative activities; creative synthesis applications; and traditional and alternative assessments, students demonstrate understanding of cultural implications and historical context, and develop a chronological and thematic appreciation of American history.

School Year Courses – 2018-2019

Art Courses

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

AP® Music Theory

Prerequisite: Ability to read at least one clef of music and proficiency in an instrument or voice

Offered: Girls only and Co-ed; Full-year

The aim of this course is to improve students' overall musicianship, focusing on performance, aural, analytical, and composition skills. Students will be able to understand music on a deeper level and to relate the theory to their personal instrument and practice. They will challenge themselves by stepping out of their comfort zones and trying something new. AP® Music Theory is an intensive, fast-paced course that touches on aspects of melody, harmony, texture, form, musical analysis, and composition. This course includes an aural section of sight-singing, melodic and harmonic dictation, and intensive ear training. Each student will compose and perform original compositions, both as an individual and in a group setting. All students enrolled in this course take the Advanced Placement exam in the spring. This is a crucial course for anyone looking to pursue music professionally or for anyone who wants to pursue their passion in music.

Creating Tomorrow – see below under *Computer Science Courses*

Computer Science Courses

One Schoolhouse offers a complete four-year computer science sequence, but students are not required to take these courses any particular order. For students who do want to take the four-year sequence, we recommend this order: Introduction to Computer Science, AP Computer Science Principles, AP Computer Science A, Creating Tomorrow. Course prerequisites may be met through prior courses, or through extracurricular programming experiences with permission of the One Schoolhouse administration.

AP® Computer Science A

Prerequisite: Successful completion of a One Schoolhouse computer science course or permission from the administration

Offered: Girls only and Co-ed; Full-year

The AP® Computer Science course introduces the key concepts of programming in Java. The analytic, critical-thinking, and problem-solving skills that students will develop in this course transfer to programming in other languages as well. This course is designed with the idea that programming should be fun, engaging, and intuitive. Students will learn to apply the main principles of object-oriented software design and programming using classes and objects, constructors, methods, instance and static variables, inheritance, class hierarchies, and polymorphism. Students work creatively and collaboratively with their classmates to discuss ethical and social issues relating to the use of technology, and develop a solid foundation from which to launch into a wide range of computer science areas. This course prepares students for the AP® Computer Science A Exam in May.

AP® Computer Science Principles

Prerequisite: None, although prior programming experience recommended

Offered: Girls only and Co-ed; Full-year

This course investigates the “big ideas” found in our digital world. Using Python, students demonstrate fundamental concepts of computer programming that can be applied across a variety of projects and languages, and explore different means of representing information digitally. They create computer programs to solve authentic problems or for personal interest, such as unique musical pieces, math calculators, and data summations. Students discuss the current state of technology and its role in our everyday lives, discerning the positive and negative influences of innovations concerning computer and network technologies to society, culture, and economics. Students develop their skills in computational thinking, logical reasoning, and describing processes through algorithms and abstraction. Finally, students demonstrate their learning by creating a portfolio for submission to the College Board and are prepared for the AP® Computer Science Principles exam in May.

Creating Tomorrow: Computer Science by Design

Prerequisite: Successful completion of a One Schoolhouse computer science course or permission from the administration

Offered: Girls only and Co-ed; Fall semester only or full-year

In this course, students enhance their design and technology skills to create software products relevant to the digital age in which we live. Combining software engineering and entrepreneurship, students create digital products such as games, web sites, videos, and mobile apps using a variety of software tools and computer languages, and learn how to brand and market these products and services. Students apply the main principles, methodologies, and techniques of the software development life cycle and learn how to conduct market research, conceptual design, prototype development, product implementation and testing, as well as branding, event management, and social media marketing. By the end of Semester I, students are positioned to design a suite of digital products that they may continue to develop and market forward.

Students may choose to enroll in this course for Semester I only (0.5 credit) or for Semesters I and II (1.0 credit). For students continuing into Semester II, this course shifts into personalized, project-based work where they engage in individual research projects. Using the knowledge and skills gained in Semester I as the foundation, students are guided through a self-designed, long-term research project on the topic of their choosing. In Semester II, students are expected to engage in deep, sustained inquiry, authentic and iterative research, critical analysis, and rigorous reflection, revision, and assessment. Pathway options from which students might choose include:

- Design solution to real-world problem or answer theoretical/ethical question;
- Social science/humanities or STEM approach to research and analysis (i.e.: source evaluation vs. experimental design process);
- Individual study/self-assessment or collaborative seminar/peer-review;
- Format for collection, critique, and evaluation of artifacts; or
- Platform for creative output or metrics to measure effectiveness of public product.

Upon completion of their inquiry-driven project, students will have gained academic maturity and expanded their ability to engage in a diverse and changing world. They will be able to draw and defend conclusions from theoretical underpinnings, contextual background, and mathematical analysis or source evaluation. Finally, they will have created and tested something useful of their own design.

Introduction to Computer Science

Prerequisite: None

Offered: Girls only and Co-ed; Full-year

The goal of this course is to create an environment where students develop skills to express their creativity in various programming languages. The course starts by introducing students to basic programming constructs and techniques using a simple but powerful drag-and-drop programming language in an animated environment. Students 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. Students learn to program in languages such as Scratch, App Inventor, HTML, JavaScript, and Processing. Throughout the course, students 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 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 complete Chinese and Latin course sequences. We teach combined AP® and Level V language courses in Chinese, French, and Spanish, and combined III/IV courses in Chinese and Latin; these combined courses are designed to serve a wide range of learners and are personalized to meet learners where they are.

Chinese

Chinese I

Prerequisite: None

Offered: Co-ed; Full-year

Chinese I is designed for students with little or no experience in learning Chinese. Students develop the basic language skills in a cultural context by understanding and responding to structured social conversations. Starting with the introduction of the Chinese language system including Pinyin, tones, radicals and characters, this course focuses on students' performance of

producing simple sentences and brief paragraphs related to the topics of greeting, sharing personal information and preferences, introducing others, making plans about and discussing school life. The corresponding cultural knowledge is introduced at appropriate intervals to enrich students' understanding of Chinese culture. Care is taken to create an authentic learning experience in reading, writing, speaking, and listening in the online environment. Students improve their overall language proficiency through weekly interactions with their teacher and classmates, a variety of internet resources, audio and video materials, and engaging activities of playing games, performing songs and tongue twisters, writing stories, collaborating for projects, taking virtual field trips and acting out roles in movies – we really do have a lot of fun! This course aligns with Cheng and Tsui's Integrated Chinese Level I lessons zero through six. By the end of Chinese I, students will be able to handle the basic functions with structured grammatical patterns in daily communication and gain a solid foundation for future learning.

Chinese II

Prerequisite: Successful completion of Chinese I

Offered: Co-ed; Full-year

Chinese II students continue to improve their Chinese skills by using both structured and created language. Cultural connections are made at appropriate intervals to familiarize students with the Chinese speaking world. Students learn to initiate and participate in daily communication, apply new vocabulary and more complex sentence patterns to fulfill the functions of expressing individual needs, describe circumstances, compare the similarities and differences of phenomenon, and demonstrate culturally contextualized understanding. Students improve character literacy, authentic language production and cultural competency. A variety of audio, visual, and textual materials are carefully selected based on the interests and preferences of the students, which optimizes the effectiveness of the online personalized experience. This course aligns with Cheng and Tsui's Integrated Chinese Level I lessons six through 12. By the end of Chinese II, students will be able to write journals, compose short Chinese songs and rhymes, share about topics related to their school life, and produce refined language freely at the paragraph level on essential social communication.

Chinese III

Prerequisite: Successful completion of Chinese II

Offered: Co-ed; Full-year

Chinese III students develop their essential Chinese language skills while gaining a deeper understanding of Chinese culture through engaging with various audio, visual, textual materials and increasing authentic language application experience. The course is designed for students who have had at least two years of Chinese study, and takes them into structured communication through comprehensive skill-enhancement with abundant task-based practical grammatical structures and sentence patterns. Students engage in group work, online seminars, real-time speaking practice and personalized learning packets to improve constructive conversation skills in Chinese. Students are highly encouraged to enjoy applying Mandarin and to make productive mistakes within the course. This course aligns with Cheng and Tsui's Integrated Chinese Level I lessons 11 through 20. By the end of this course, students will acquire substantive vocabulary and structures to creating essays, compose songs and rhymes, discuss written and audio primary sources, and present speeches that are related to a wide variety of popular topics. The goal is to be able to function successfully in daily life in a Chinese-speaking world.

Chinese III/IV

Prerequisite: Successful completion of Chinese II or III

Offered: Co-ed; Full-year

Chinese III/IV is a rigorous class that prepares students for AP® Chinese Language and Culture or Chinese V course the following year. Students develop language competencies, while building proficiency in applying Mandarin in a variety of real-life situations. The course builds through unrehearsed listening and reading texts, engaging essays, authentic projects and virtual field trips. Classroom discussions and debates are added sequentially so that students develop both communication and language learning strategies. A variety of audio, visual, and textual materials are carefully selected based on the interests and preferences of the students, to reflect the diversity of students' lives, school experience, and personal/social issues. Students should be prepared for a range of collaborative and individual activities each week, including speaking in real time with each other and the instructor. This course aligns with Cheng and Tsui's Integrated Chinese Level II lessons 21 through 30. By the

end of this course, students will be able to relate past, present, and future experiences to conduct complicated daily activities in Mandarin.

AP® Chinese Language and Culture

Chinese V

Prerequisite: Successful completion of One Schoolhouse's Chinese III/IV or permission from the administration

Offered: Co-ed; Full-year

AP® Chinese Language and Culture provides deeper understanding and broader application into Chinese language and culture for intermediate Chinese learners. This course focuses on applying Chinese language and cultural skills in real-world problem situations, and experiencing a variety of topics in Chinese history, geography, music and arts, literature, daily life, and national and global issues. Students use team work, group online seminars, one-to-one extra help, and a variety of engaging activities and experiential projects to meet individual needs. Students gain the high language proficiency and cultural competency to compare, examine, evaluate and solve conflicts successfully. Students may select the AP® or Chinese V track. AP® students are expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP® exam. 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.

French

AP® French Language and Culture

French V

Prerequisite: Successful completion of French IV, or French III and immersion experience

Offered: Co-ed; Full-year

AP French Language and Culture and French V students will be able to interpret and discuss historical, cultural, and current event topics pertaining to the various communities that exist in the Francophone world. Six topics are explored throughout the course: Personal and Public Identities, Families and Communities, Global Challenges, Science and Technology, Contemporary Life, and Beauty and Aesthetics. Students use information from a wide range of sources, and explore contemporary media, able to engage in mature social media communication and analyze songs as more than entertainment. They compare cultural practices within the Francophone world and their own world. Students may select the AP® or French V track. AP® students are expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP® exam. French V is recommended for students who have completed three or four years of French but do not want to prepare for the AP® exam.

Latin

Latin I

Prerequisite: None

Offered: Co-ed; Full-year

Latin I is intended for students who have not previously studied Latin. The course develops competencies in reading and interpreting, oral expression and aural comprehension. Students learn the basic components and structures of Latin that allow them to develop basic reading strategies, which they use to build critical-thinking skills. Upon completion of this course, students acquire 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. Students 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 take quizzes and have tests, but they 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 Latin I

Offered: Co-ed; Full-year

Latin II students develop the skills and tools they need to read and understand authentic authors. Students increase their understanding of complex sentences and how to break those down into manageable parts. Students learn many skills to help them with this goal, including mastering vocabulary, the subjunctive mood, passive voice, participles, various uses of noun cases, and degrees of adjectives. Students not only work with these words at sight, but are also encouraged to listen to and speak Latin. Students explore different cultural topics to provide context for each work and to compare our modern world to

the ancient one. Students frequently learn about different aspects of ancient culture to enhance the reading at hand or to make connections to modern events. These topics include mythology, Roman history and daily life, and philosophy. Students who complete Latin II are well-prepared to continue their studies in Latin III.

Latin III/IV

Prerequisite: Successful completion of Latin II

Offered: Co-ed; Full-year

Latin III/IV is a combined class for students of varied backgrounds, and prepares students for One Schoolhouse's AP® Latin course. Students focus on developing three competencies: understanding the process of reading Latin linearly, forming logical expectations for deduction/extrapolation in any discipline, and understanding the complexity of historical/political decision-making and its imperfect outcomes. Students learn grammatical and syntactical structures not treated in Latin II, such as indirect statements and various independent uses of the subjunctive mood. They also learn to interpret Latin sentence fragments to develop syntactic expectations for the rest of a sentence. Students study literary devices and meter and the strategies for reading poetry. Students acquire deeper contextual knowledge of the social and political challenges of the Republic and the early Empire, and through varied projects and presentations, they demonstrate their knowledge of Roman perspectives and discuss the connections between Roman culture and modern societies.

AP® Latin

Prerequisite: Successful completion of at least three years of high school Latin

Offered: Co-ed; Full-year

AP® Latin students meet the challenge of reading and analyzing passages of Caesar's Gallic Wars and Vergil's Aeneid. The course emphasizes reading and understanding the works of these two authors, as well as diving into the historical context of both works. Students also look at literary devices and discuss how each author uses Latin and to what effect. Students practice these analytical skills not only on the proscribed passages, but also on sight passages from various authors with weekly assignments. Students 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 prepare translations and essays under time constraints similar to those on the AP® exam. Additionally, students peer edit essays to help strengthen their writing and analysis skills. All students enrolled in this course are thoroughly prepared to take the Advanced Placement exam in the spring.

Spanish

AP® Spanish Literature and Culture

Spanish V: Literature and Culture

Prerequisite: Successful completion of Spanish IV, or Spanish III and immersion experience

Offered: Co-ed; Full-year

The AP® Spanish Literature and Culture and Spanish V: Literature and Culture course provides a college level survey of texts from Peninsular, Latin American and U.S. Hispanic authors. Students complete readings from the College Board required reading list, and analyze the works within their social, literary, and historical contexts. Students build an understanding of form, structure, theme and literary devices; they then analyze and evaluate the global interdependence that fosters the evolution of Hispanic and Latino literatures. The course is organized around the six themes designated by the AP® curriculum framework and conducted entirely in Spanish. Students may select the AP® or Spanish V track, depending on whether they plan to take the AP® exam in May. AP® students are expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP® exam. Spanish V is recommended for students who want to read literature in Spanish but do not want to prepare for the AP® exam.

Math Courses

AP® Calculus AB

Prerequisite: Successful completion of Pre-Calculus

Offered: Co-ed; Full-year

The AP® Calculus AB course is a standard course in the calculus of a single variable. Students learn conceptual reasoning, presenting a solution algebraically, geometrically, numerically or verbally. Students develop not only on a clear understanding of the concepts, but also on their applicability in real world situations. By the end of the course, students be able to read and interpret graphical data accurately; use words to explain their reasoning and provide context for final answers; and understand that they know how to learn online. All of the topics in the AP AB course are covered, as well as additional topics as time permits. Major topics include limits, continuity, derivatives and applications, integrals and applications, and first order linear

differential equations. This personalized course features discussions, reflections, and projects that will help students to master skills in an engaging way.

AP® Calculus BC

Prerequisite: Successful completion of Pre-Calculus or Calculus course covering natural logarithms, series/sequences, parametric/polar functions, vectors, and limits

Offered: Girls only and Co-ed; Full-year

The AP® Calculus BC course is a standard course in the calculus of a single variable. Students learn conceptual reasoning, presenting a solution algebraically, geometrically, numerically or verbally. Students develop a clear understanding of the concepts, as well as their applicability in real world situations. By the end of the course, students are able to read and interpret graphical data accurately; use words to explain their reasoning and provide context for final answers; and understand that they know how to learn online. All topics in the AP AB course are covered, and 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 personalized course features discussions, reflections, and projects to help students master skills in an engaging way.

AP® Statistics

Statistics

Prerequisite: Successful completion of Algebra II

Offered: Girls only and Co-ed; Full-year

AP® Statistics helps students develop strategies to explore data by describing patterns and departures from those patterns, as well as anticipating patterns. Learning comes through planning, designing, and conducting studies through sampling and experimentation. Students use probability and simulation, estimate population parameters and test hypotheses through problem solving and application, and draw connections between all aspects of the statistical process: design, analysis, and conclusions. Students often work in small collaborative groups to explore problems and share ideas. Active participation- individual and group projects, peer review of student work, and discussion board conversations- helps students learn how to communicate methods, results, and interpretations effectively using the vocabulary of statistics and are key to student success. Students may select the AP® or non-AP® track in this course. AP® students are 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: Girls only and Co-ed; Full-year

Students in this course learn how to think about vectors, the spaces in which vectors live, and linear mappings between those spaces. They apply those skills to solve a wide variety of practical problems. They develop powerful new ways of thinking mathematically, and gain insight and application skills for fields in which multiple variables interact in ways that can be modeled by systems of linear equations- 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. 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 a challenge to think in new ways, and to tackle problems in the real world.

Multivariable Calculus and Differential Equations

Prerequisite: Successful completion of AP® Calculus BC or equivalent

Offered: Girls only and Co-ed; Full-year

Students in this course start the year by strengthening skills in the calculus of a single variable (including the calculus of parametric and polar equations, and advanced integration techniques). They learn how to describe lines, planes, and a variety of other surfaces in space. They then apply the tools of calculus to functions in multidimensional spaces. They master the vector-calculus skills in a typical college-level Calculus III course, including vectors and vector-valued functions; partial derivatives, directional derivatives, and gradients; multiple integration; and line and surface integrals. Students learn to identify and solve a variety of differential equations, including exact first-order equations, second-order homogeneous and nonhomogeneous linear equations, and partial differential equations. Students apply what they're learning to various scientific fields. Built on a foundation of sophisticated problem solving, the course also features meaty mathematical discussions, a major project, and exploratory activities that will help students develop their advanced math skills.

Science Courses

AP® Environmental Science

Prerequisite: Successful completion of one year of high school laboratory science or permission from the administration

Offered: Girls only and Co-ed; Full-year

AP® Environmental Science provides 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. Students make real-world connections between the topics introduced in class and those in their own “backyard.” They participate in 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 engage authentically and creatively with their classmates through a variety of discussions, activities, labs, and projects to investigate the real-world problems that face our environment today. They study our environment and work collaboratively to understand our role in it. Students taking this course are well prepared for the AP® Environmental Science Exam in May.

AP® Physics 1

Prerequisite: Successful completion of Algebra II

Offered: Girls only and Co-ed; Full-year

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 students planning to enter life science or pre-med programs in college. The goal of the course is to develop an understanding of physics through inquiry-based investigations. Students explore principles of Newtonian mechanics, work, energy, power, waves, sound, and simple circuits. Additional supplemental topics are covered that build understanding of the primary College Board curriculum. Developing the ability to reason qualitatively and quantitatively is a principal focus. Those skills are developed through the use of modeling, graphing, diagramming, unit analysis, symbolic algebra, and data analysis. Laboratory exercises are 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: Girls only and Co-ed; Full-year

AP® Physics C Mechanics is a calculus based, college level physics course. The course is especially designed for students planning to enter college programs such as engineering or physical sciences. The goal of the course is to develop an understanding of physics through inquiry-based investigations. Students explore principles of Newtonian mechanics, work, energy, power, systems of particles, linear momentum, circular motion, rotation, oscillations, and gravitation. Students use differential and integral calculus. Students master topics that build understanding of the primary College Board curriculum, focusing on the ability to reason qualitatively and quantitatively. Students develop skills through modeling, graphing, diagramming, unit analysis, symbolic algebra and calculus, and data analysis. Laboratory exercises 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 permission from the administration

Offered: Girls only and Co-ed; Full-year

Forensic Science examines the application of science to the criminal and civil laws enforced by the criminal justice system. Students explore the science of criminology by using a combination of science disciplines. Students learn to differentiate between actual techniques and some of those portrayed on popular television shows; they evaluate current procedures used by real crime labs to understand some of the limitations of the law, police, and forensics science. Students 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. Students investigate simulated crime and accident scenes, collect and analyze evidence, and develop observation skills and deductive reasoning. The course includes a study of the variety of careers in forensic science. This exploration is 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.

Engineering, Design, and Robotics

Prerequisite: Successful completion of one year of high school laboratory science or permission from the administration

Offered: Girls only and Co-ed; Fall semester or full year

In this course, students will use the engineering design process to explore multiple branches of engineering, and examine ethics in engineering and the responsibilities associated with shaping communities. Some challenges in this course will include delving into issues around population growth and food access, designing urban farming solutions, and learning more about water access by designing, building and testing a solar desalination apparatus. Students will consider diverse perspectives when designing technology, and learn how to communicate scientific concepts on which designs are based, both orally and in written form. Through active problem solving, this course addresses concepts and skills relevant to a career in engineering, including: applying the engineering design process to a specific problem; working effectively and collaboratively with others; demonstrating originality and inventiveness in your work; reflecting critically to improve creative efforts in problem solving; and viewing success as a cyclical process.

Students may choose to enroll in this course for Semester I only (0.5 credit) or for Semesters I and II (1.0 credit). For students continuing into Semester II, this course shifts into personalized, project-based work where they engage in individual research projects. Using the knowledge and skills gained in Engineering as the foundation, students are guided through a self-designed, long-term research project on the topic of their choosing. In Semester II, students are expected to engage in deep, sustained inquiry, authentic and iterative research, critical analysis, and rigorous reflection, revision, and assessment. Pathway options from which students might choose include:

- Design solution to real-world problem or answer theoretical/ethical question;
- Social science/humanities or STEM approach to research and analysis (i.e.: source evaluation vs. experimental design process);
- Individual study/self-assessment or collaborative seminar/peer-review;
- Format for collection, critique, and evaluation of artifacts; or
- Platform for creative output or metrics to measure effectiveness of public product.

Upon completion of their inquiry-driven project, students will have gained academic maturity and expanded their ability to engage in a diverse and changing world. They will be able to draw and defend conclusions from theoretical underpinnings, contextual background, and mathematical analysis or source evaluation. Finally, they will have created and tested something useful of their own design.

Marine Science

Prerequisite: Successful completion of one year of high school laboratory science or permission from the administration

Offered: Co-ed; Full-year

Marine Science introduces students to oceanography through a review of earth science concepts, investigation of physical and chemical ocean systems, the exploration of marine organisms and ecology, and the role of climate change in both marine and global systems. Students read and dissect scientific literature; integrate their knowledge of marine ecological systems into practical applications of science; and bridge connections between science, society, and political interests. Perhaps most importantly, students 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. Students learn through virtual and at-home laboratory exercises; scientific literature analysis; reading and video assignments; and research using online journals and current oceanographic data. This work is largely collaborative as students engage with the teacher and with their classmates on projects and labs. There is 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 permission from the administration

Offered: Girls only and Co-ed; Full-year

In this project-based course, students learn 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 impacts the brain. They explore brain diseases, disorders, imaging techniques and treatments. Armed with this solid foundation in neuroscience, students spend the second semester learning to think like doctors. Students engage in group and individual research projects and seminar-style problem solving which will help to develop the ability to find answers to questions that may not be addressed specifically in the course. They review actual cases in the neuroscience field and follow the doctrine of ethical analysis with patients. Students are guided through a self-designed, long-term research project. This course is designed for students who are considering college majors in a medical or health related field; by the end of it, students will have a basic knowledge of Neuroscience.

Social Science and Humanities Courses

Abnormal Psychology

Prerequisite: Successful completion of one year of high school social studies

Offered: Co-ed; Fall semester or full year

Abnormal Psychology begins with an overview of human behavior, and then introduces students to various psychological disorders as well as theoretical concepts that underlie each one. Students explore theoretical, clinical, and experimental perspectives on the study of psychopathology. Students learn terminology, classification, etiology, assessment, and treatment of each of the major disorders. Upon completion of this course, the students are able to distinguish between normal and abnormal patterns of behavior. This course features discussions, partner and group projects, and other activities that help students to recognize the ways that abnormal psychology manifests in the real world. The class is designed for eleventh and twelfth graders, and may be appropriate for mature tenth graders.

Students may choose to enroll in this course for Semester I only (0.5 credit) or for Semesters I and II (1.0 credit). For students continuing into Semester II, the course shifts into personalized, project-based work where they engage in individual research projects. Using the knowledge and skills gained in Abnormal Psychology as the foundation, students are guided through a self-designed, long-term research project on the topic of their choosing. In Semester II, students are expected to engage in deep, sustained inquiry, authentic and iterative research, critical analysis, and rigorous reflection, revision, and assessment. Pathway options from which students might choose include:

- Design solution to real-world problem or answer theoretical/ethical question;
- Social science/humanities or STEM approach to research and analysis (i.e.: source evaluation vs. experimental design process);
- Individual study/self-assessment or collaborative seminar/peer-review;
- Format for collection, critique, and evaluation of artifacts; or
- Platform for creative output or metrics to measure effectiveness of public product.

Upon completion of their inquiry-driven project, students will have gained academic maturity and expanded their ability to engage in a diverse and changing world. They will be able to draw and defend conclusions from theoretical underpinnings, contextual background, and mathematical analysis or source evaluation. Finally, they will have created and tested something useful of their own design.

AP® Art History

Art History

Prerequisite: Successful completion of one year of high school social studies

Offered: Girls only and Co-ed; Full-year

Students in Art History and AP® Art History examine and critically analyze major forms of artistic expression from diverse cultures spanning 27,000 years. By investigating an image set of 250 works, students develop an historic and cultural context for art history from a global perspective. Influences such as patronage, politics, class, belief systems, gender, ethnicity, and cross-cultural interactions inform students' analysis of the style and content of art. Emphasis is placed on the language of art history and the empathetic connection between art history and the world. Students experience, research, discuss, and write about art, artists, and art making. Students will develop the vocabulary to express their thoughts and feelings about art. By the end of the class, students are able to express their voices through a position-based essay. Students choosing the AP® class are expected to delve deeper into the topics, take AP®-style assessments, and prepare for the AP® exam in the spring.

AP® English Literature and Composition

Prerequisite: Successful completion of two years of high school English or permission from the administration

Offered: Girls only and Co-ed; Full-year

Students enrolled in AP® English Literature and Composition have the opportunity to practice a graceful swan dive into what it means to listen as well as what it means to speak with their own authentic voices. They consider fiction, drama, poetry, and short stories from the 1600s to the present, discovering how each work portrays some facet of the universal human condition and analyzing the interplay between diverse individuals, nations, and cultures expressed in those works. They look closely at the interplay between content (the story a writer wants to tell or the moment he or she wants to capture) and form (the way

the story or moment is offered to the reader) to enhance understanding of the texts. Students gain the necessary skills for success on the AP® exam in May. Equally important, they amass incontrovertible proof of the global interdependence that characterizes the modern world.

AP® Human Geography

Prerequisite: Successful completion of eighth grade

Offered: Co-ed; Full-year

AP® Human Geography is a yearlong course that addresses three basic questions: when? where? and why? Students interrogate sources regularly and build arguments that analyze region, diffusion, and sustainability - all with a goal of solving real world problems. The course emphasizes geographic models and their applications. Students compare case studies from around the globe to local and national situations to address complex scenarios, such as: How do geographers create models to understand and explain complex patterns in demography, migration, development, and the distribution of goods and people? How does globalization produce space-time compression? How does chain migration affect the distribution of ethnicities, languages, religions? What variables are likely to result in desired outcomes and unintended consequences when tackling a geographical challenge? Units of study include population, migration, culture, language, religion, ethnicity, political geography, economic development, industry, agriculture, and urban geography. Formative and summative assessments are modeled upon the format of AP tests and evaluate a student's skill development in five course competencies: remembering and understanding; contextual awareness; reasoning, analysis, and synthesis; communication skills; and independent and collaborative work.

Students taking this course are well prepared for the AP® Human Geography Exam in May.

AP® Macroeconomics

Prerequisite: Successful completion of Algebra II

Offered: Girls only and Co-ed; Full-year

AP® Macroeconomics introduces 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. Students analyze the impact of fiscal and monetary policies as well as the debates surrounding the implementation of each. This course involves extensive reading, problem-solving exercises, online discussions, and research and writing about contemporary macroeconomic issues. Multiple modalities are employed for content presentation so as to encourage personalization; assessment evaluates each student's ability to utilize skill sets related to economic decision making. Strong reading, algebra, and analytical skills are necessary for success, as is strong motivation. AP® Macroeconomics prepares students to become informed and thoughtful and thoroughly prepare students to take the AP® exam in the spring. AP® Macroeconomics is recommended for juniors and seniors.

AP® Microeconomics

Prerequisite: Successful completion of Algebra II

Offered: Girls only and Co-ed; Full-year

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 examine various models that are used to conceptualize how our economy operates, and explore the role that government plays in a given economy. Students analyze societal issues through the lens of economic reasoning, and develop skills that promote time management and intrinsic motivation. Students complete collaborative projects, group discussions, problem sets, quizzes, and tests. The curriculum is developed to prepare students for the AP® Microeconomics examination in May, and is recommended for juniors and seniors with strong mathematical reasoning skills and an interest in finance, business, or government.

AP® Psychology

Psychology

Prerequisite: Successful completion of eighth grade

Offered: Girls only and Co-ed; Full-year

AP® Psychology introduces students to the systematic and scientific study of human behavior and mental processes. Students learn the psychological facts, principles, and phenomena contained within the major branches of psychology. They work towards demonstrating the critical thinking skills necessary to observe complex relationships and generate an awareness of the need for reflective skepticism on apparent cause and effect. They develop their methodological critical thinking abilities by applying different research methods in psychology and evaluating the quality of existing research design. They apply different research methods in psychology and evaluating the quality of existing research design. Charged with experiential problem solving and field research opportunities, students collaborate and develop organization and communication skills to support these team efforts. Students taking the AP® class are expected to delve deeply into the topics, take AP®-style assessments, and prepare for the AP® exam in the spring.

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

Prerequisite: Successful completion of one year of high school social studies

Offered: Girls only and Co-ed; Full-year

AP US Government and Politics and AP Comparative 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 focuses on American government, including how different agencies within the government interact, and how these agencies and their policies affect the daily lives of Americans. The spring covers AP Comparative Government and Politics, which is an introduction to the methodology of comparative politics, and an in-depth look at six different states: Iran, Nigeria, China, Russia, Mexico, and Great Britain. Students will understand what factors contributed to the development of the American political system, and the structure of the U.S. government and the American political process. They will also recognize major comparative political concepts and how to apply them. Finally, students will be able to compare political institutions and processes from across the world, and to form sound conclusions based on those comparisons. This course prepares students for both AP® exams in the spring.

Business and Entrepreneurship

Prerequisite: Successful completion of Algebra II and one year of high school social studies

Offered: Girls only and Co-ed; Fall semester or full year

Business and Entrepreneurship students gain fluency in foundational economic principles and explore business planning, development, and management. In Semester I, students study the fundamentals of microeconomics, including supply and demand, incentives, pricing, and production, followed by macroeconomic concepts such as economic indexes, The Fed, and financial markets; as well as trade agreements and globalization.

Students may choose to enroll in this course for Semester I only (0.5 credit) or for Semesters I and II (1.0 credit). For students continuing into Semester II, the course shifts into personalized, project-based work where they engage in individual research projects. Using the knowledge and skills gained in Business and Entrepreneurship as the foundation, students are guided through a self-designed, long-term research project on the topic of their choosing. In Semester II, students are expected to engage in deep, sustained inquiry, authentic and iterative research, critical analysis, and rigorous reflection, revision, and assessment. Pathway options from which students might choose include:

- Design solution to real-world problem or answer theoretical/ethical question;
- Social science/humanities or STEM approach to research and analysis (i.e.: source evaluation vs. experimental design process);
- Individual study/self-assessment or collaborative seminar/peer-review;
- Format for collection, critique, and evaluation of artifacts; or
- Platform for creative output or metrics to measure effectiveness of public product.

Upon completion of their inquiry-driven project, students will have gained academic maturity and expanded their ability to engage in a diverse and changing world. They will be able to draw and defend conclusions from theoretical underpinnings, contextual background, and mathematical analysis or source evaluation. Finally, they will have created and tested something useful of their own design.

Civics, Culture, and Intersectionality

Prerequisite: Successful completion of one year of high school social studies or permission from the administration

Offered: Co-ed; Fall semester or full year

We are part of many communities that shape who we are and where we will be in the future. This course provides students with a space to make connections. By exploring various aspects of our identities and lived experiences, we evaluate how the concept of citizenship and the individual citizen work together to create the communities that we live in. From the launching point of the knowledge, values, and feelings we bring into the class, we uncover our own biases, explore the difference between fact and opinion, practice empathy, and learn to voice our own perspectives without silencing the perspectives of others. We practice civil discourse, develop our ability to use evidence to support and argument, and move from what makes people citizens of a particular community to how we, as global citizens, should live. Students who take this course will leave with increased empathy, global awareness, and conviction.

Students may choose to enroll in this course for Semester I only (0.5 credit) or for Semesters I and II (1.0 credit). For students continuing into Semester II, the course shifts into personalized, project-based work where they engage in individual research projects. Using the knowledge and skills gained in Civics, Culture, and Intersectionality as the foundation, students are guided through a self-designed, long-term research project on the topic of their choosing. In Semester II, students are expected to engage in deep, sustained inquiry, authentic and iterative research, critical analysis, and rigorous reflection, revision, and assessment. Pathway options from which students might choose include:

- Design solution to real-world problem or answer theoretical/ethical question;
- Social science/humanities or STEM approach to research and analysis (i.e.: source evaluation vs. experimental design process);
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Gender and Sexual Identity in America

Prerequisite: Successful completion of one year of high school social studies or permission from the administration

Offered: Co-ed; Fall semester or full year

What is the role of gender and sexuality in identity formation? How has historical climate affected the identity expression of LGBTQ Americans? This course opens with an examination of historic roots of gender and sexuality identity in America, starting at the end of the nineteenth century and continuing through present day. The course focuses on the changing nature of identities over time, including efforts to expand and restrict identities in cultural, religious, and political forms. With this historical foundation, students work individually and collaboratively on research initiatives in the second semester, in topics of their choosing, such as gay marriage, gender reassignment, reproductive rights, workplace discrimination, HIV/AIDS, heteronormativity, etc. This course offers students the opportunity to both develop cultural competency around gender and sexual identity, and explore their own interests on a wide range of related topics.

Students may choose to enroll in this course for Semester I only (0.5 credit) or for Semesters I and II (1.0 credit). For students continuing into Semester II, the course shifts into personalized, project-based work where they engage in individual research projects. Using the knowledge and skills gained in Gender and Sexual Identity in America as the foundation, students are guided through a self-designed, long-term research project on the topic of their choosing. In Semester II, students are expected to engage in deep, sustained inquiry, authentic and iterative research, critical analysis, and rigorous reflection, revision, and assessment. Pathway options from which students might choose include:

- Design solution to real-world problem or answer theoretical/ethical question;
- Social science/humanities or STEM approach to research and analysis (i.e.: source evaluation vs. experimental design process);
- Individual study/self-assessment or collaborative seminar/peer-review;
- Format for collection, critique, and evaluation of artifacts; or
- Platform for creative output or metrics to measure effectiveness of public product.

Upon completion of their inquiry-driven project, students will have gained academic maturity and expanded their ability to engage in a diverse and changing world. They will be able to draw and defend conclusions from theoretical underpinnings,

contextual background, and mathematical analysis or source evaluation. Finally, they will have created and tested something useful of their own design.

Independent Study

Prerequisite: Recommendation from a school administrator at a student's permanent school and permission from the One Schoolhouse administration

Offered: Co-ed; Full year

Want to take a deep dive into your favorite subject but need some teacher support? One Schoolhouse arranges for a facilitator for this year-long, student-designed independent study in a core or elective subject. The teacher and student work collaboratively to design a syllabus, establish pacing, and determine metrics by which progress is measured. The student produces a cumulative portfolio, which might include exemplars of content and skills mastery as well as a capstone independent research project. Please contact us at academics@oneschoolhouse.org for more information on independent studies through One Schoolhouse.