

PHS Advanced Placement Course Information

Social Science Courses (category A in the A-G college requirements)

AP World History (Grade 10 core class; Grade 11-12 elective)

AP World History focuses on developing students' abilities to think conceptually about world history from approximately 8000 BCE to the present and apply historical thinking skills as they learn about the past. Five themes of equal importance — focusing on the environment, cultures, state-building, economic systems, and social structures — provide areas of historical inquiry for investigation throughout the course. AP World History encompasses the history of the five major geographical regions of the globe: Africa, the Americas, Asia, Europe, and Oceania, with special focus on historical developments and processes that cross multiple regions.

Prerequisites: There are no prerequisites for AP World History, although students should be able to read a college-level textbook and write grammatically correct, complete sentences.

Teacher: Mr. Grady egrady@pittsburg.k12.ca.us and Mr. Simmons simmons@pittsburg.k12.ca.us

AP United States History (Grade 11 core class)

AP United States History focuses on developing students' abilities to think conceptually about U.S. history from approximately 1491 to the present and apply historical thinking skills as they learn about the past. Seven themes of equal importance — identity; peopling; politics and power; work, exchange, and technology; America in the world; environment and geography; and ideas, beliefs, and culture — provide areas of historical inquiry for investigation throughout the course. These require students to reason historically about continuity and change over time and make comparisons among various historical developments in different times and places.

Prerequisites: There are no prerequisites for AP U.S. History. Students should be able to read a college-level textbook and write grammatically correct, complete sentences.

Teacher: Jessica Parfitt, Room G215, jparfitt@pittsburg.k12.ca.us

AP United States Government & Politics (Grade 12 core class)

AP United States Government and Politics introduces students to key political ideas, institutions, policies, interactions, roles, and behaviors that characterize the political culture of the United States. The course examines politically significant concepts and themes, through which students learn to apply disciplinary reasoning assess causes and consequences of political events, and interpret data to develop evidence-based arguments.

Prerequisites: There are no prerequisite courses for AP United States Government and Politics. Students should be able to read a college level textbook and write grammatically correct, complete sentences.

Teachers: Mrs. Bowen abowen@pittsburg.k12.ca.us

English Courses (category B in the A-G college requirements)

AP English Language & Composition (Grade 11 core class)

The AP English Language and Composition course aligns to an introductory college-level rhetoric and writing curriculum, which requires students to develop evidence-based analytic and argumentative essays that proceed through several stages or drafts.

Students evaluate, synthesize, and cite research to support their arguments. Throughout the course, students develop a personal style by making appropriate grammatical choices. Additionally, students read and analyze the rhetorical elements and their effects in non-fiction texts, including graphic images as forms of text, from many disciplines and historical periods.

Prerequisite: There are no prerequisite courses for AP English Language and Composition. Students should be able to read and comprehend college-level texts and apply the conventions of Standard Written English in their writing.

Teachers: Mr. Nordenstedt snordenstedt@pittsburg.k12.ca.us and Ms. Parker kparker@pittsburg.k12.ca.us

AP English Literature & Composition (Grade 12 core class)

The AP English Literature and Composition course aligns to an introductory college-level literary analysis course. The course engages students in the close reading and critical analysis of imaginative literature to deepen their understanding of the ways writers use language to provide both meaning and pleasure. As they read, students consider a work's structure, style, and themes, as well as its use of figurative language, imagery, symbolism, and tone. Writing assignments include expository, analytical, and argumentative essays that require students to analyze and interpret literary works.

Prerequisites: There are no prerequisite courses for AP English Literature and Composition. Students should be able to read and comprehend college-level texts and apply the conventions of Standard Written English in their writing.

Teachers: Mr. Masuda jmasuda@pittsburg.k12.ca.us

Mathematics Courses (category C in the A-G college requirements)

AP Calculus AB and AP Calculus BC (core class or elective)

AP CalcAB: AP Calculus AB is roughly equivalent to a first semester college calculus course devoted to topics in differential and integral calculus. The AP course covers topics in these areas, including concepts and skills of limits, derivatives, definite integrals, and the Fundamental Theorem of Calculus. The course teaches students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations. Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions.

AP CalcBC: AP Calculus BC is roughly equivalent to both first and second semester college calculus courses and extends the content learned in AB to different types of equations and introduces the topic of sequences and series. The AP course covers topics in differential and integral calculus, including concepts and skills of limits, derivatives, definite integrals, the Fundamental Theorem of Calculus, and series. The course teaches students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations. Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions.

Prerequisites: Before studying calculus, all students should complete four years of secondary mathematics designed for college-bound students: courses in which they study algebra, geometry, trigonometry, analytic geometry, and elementary functions. These functions include linear, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, and piecewise-defined functions. In particular, before studying calculus, students must be familiar with the properties of functions, the algebra of functions, and the graphs of functions. Students must also understand the language of functions (domain and range, odd and even, periodic, symmetry, zeros, intercepts, and so on) and know the values of the trigonometric functions at the numbers 0 , $\pi/6$, $\pi/4$, $\pi/3$, $\pi/2$, and their multiples.

Teachers: Alicia Puzak (CalcAB), Room B217, apuzak@pittsburg.k12.ca.us and Dobrin Hunter (CalcBC), Room B207, dhunter@pittsburg.k12.ca.us

AP Statistics (core class or elective)

The AP Statistics course is equivalent to a one-semester, introductory, non-calculus-based college course in statistics. The course introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There are four themes in the AP Statistics course: exploring data, sampling and experimentation, anticipating patterns, and statistical inference. Students use technology, investigations, problem solving, and writing as they build conceptual understanding.

Prerequisites: Students must have taken second-year algebra before enrolling in AP Statistics.

Teacher: Chris Leong, Room B215, cleong@pittsburg.k12.ca.us

Laboratory Science Courses (category D in the A-G college requirements)

AP Biology (Grade 11-12 core class or elective)

AP Biology is an introductory college-level biology course. Students cultivate their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes — energy and communication, genetics, information transfer, ecology, and interactions.

Laboratory Requirement: This course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry based investigations that provide students with opportunities to apply the science practices.

Prerequisite: Students should have successfully completed high school courses in biology and chemistry.

Teacher: Ms. Moreno nataliemoreno@pittsburg.k12.ca.us and Ms. DiMaggio sdimaggio@pittsburg.k12.ca.us

AP Chemistry (Grade 11-12 core class or elective)

The AP Chemistry course provides students with a college-level foundation to support future advanced course work in chemistry. Students cultivate their understanding of chemistry through inquiry-based investigations, as they explore topics such as: atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium.

Laboratory Requirement: This course requires that 25 percent of the instructional time provides students with opportunities to engage in laboratory investigations. This includes a minimum of 16 hands-on labs, at least six of which are inquiry based.

Prerequisites: Students should have successfully completed a general high school chemistry course and at least be enrolled in Algebra II.

Teacher: Denise Golshan dgolshan@pittsburg.k12.ca.us

AP Physics 1 (Grade 11-12 core class or elective)

AP Physics 1 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of Physics through inquiry-based investigations as they explore topics such as Newtonian mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits.

Laboratory Requirement: This course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry based investigations that provide students with opportunities to apply the science practices.

Prerequisites: There are no prerequisite courses. Students should have completed geometry and be concurrently taking Algebra II or an equivalent course. Although the Physics 1 course includes basic use of trigonometric functions, this understanding can be gained either in the concurrent math course or in the AP Physics 1 course itself.

Teacher: Helen Fitzmaurice hfitzmaurice@pittsburg.k12.ca.us

AP Physics C (Grade 11-12 core class or elective)

AP Physics C is a year-long course with two different focuses:

AP Physics C: Electricity & Magnetism is a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. Introductory differential and integral calculus is used throughout the course.

AP Physics C: Mechanics is equivalent to a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as kinematics; Newton's laws of motion; work, energy and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. Introductory differential and integral calculus is used throughout the course.

Laboratory Requirement: AP Physics C: Electricity & Magnetism and AP Physics C: Mechanics should include a hands-on laboratory component comparable to a semester-long introductory college-level physics laboratory. Students should spend a minimum of 20 percent of instructional time engaged in hands-on laboratory work.

Students ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress. Each student should complete a lab notebook or portfolio of lab reports.

Prerequisites: Students should have taken or be concurrently taking calculus.

Teacher: Helen Fitzmaurice hfitzmaurice@pittsburg.k12.ca.us

World Language Courses (category E in the A-G college requirements)

AP Spanish Language & Culture (core class or elective)

The AP Spanish Language and Culture course emphasizes communication (understanding and being understood by others) by applying interpersonal, interpretive, and presentational skills in real-life situations. This includes vocabulary usage, language control, communication strategies, and cultural awareness. The AP Spanish Language and Culture course strives not to overemphasize grammatical accuracy at the expense of communication. To best facilitate the study of language and culture, the course is taught almost exclusively in Spanish. The AP Spanish Language and Culture course engages students in an exploration of culture in both contemporary and historical contexts. The course develops students' awareness and appreciation of cultural products (e.g., tools, books, music, laws, conventions, institutions); practices (patterns of social interactions within a culture); and perspectives (values, attitudes, and assumptions).

Prerequisites: There are no prerequisites; however, students are typically in their fourth year of high school-level Spanish language study. In the case of native or heritage speakers, there may be a different course of study leading to this course.

Teacher: Mario Mendoza mmendoza@pittsburg.k12.ca.us

AP Spanish Literature & Culture (core class or elective)

The AP Spanish Literature and Culture course uses a thematic approach to introduce students to representative texts (short stories, novels, poetry, and essays) from Peninsular Spanish, Latin American, and United States Hispanic literature. Students develop proficiencies across the full range of communication modes (interpersonal, presentational, and interpretive), thereby honing their critical reading and analytical writing skills. Literature is examined within the context of its time and place, as students reflect on the many voices and cultures present in the required readings. The course also includes a strong focus on cultural connections and comparisons, including exploration of various media (e.g., art, film, articles, literary criticism).

Prerequisites: While there are no prerequisites for this course, AP Spanish Literature and Culture is designed for students who have successfully completed at least three years of high school-level Spanish language study. While not a prerequisite, students may wish to complete the AP Spanish Language and Culture course before taking AP Spanish Literature and Culture, as the texts are presented in Spanish. In the case of native or heritage speakers, there may be a different course of study leading to this course.

Teacher: Eugenia Rodriguez erodriguez@pittsburg.k12.ca.us

College Preparatory Electives (category G in the A-G college requirements)

AP Human Geography (elective)

The AP Human Geography course is equivalent to an introductory college-level course in human geography. The course introduces students to the systematic study of patterns and processes that have shaped human understanding, use, and alteration of Earth's surface. Students employ spatial concepts and landscape analysis to examine socioeconomic organization and its environmental consequences. They also learn about the methods and tools geographers use in their research and applications. The curriculum reflects the goals of the National Geography Standards (2012).

Prerequisites: There are no prerequisites for AP Human Geography. Students should be able to read college-level texts and apply the conventions of Standard Written English in their writing.

Teacher: Justin Nelson jnelson@pittsburg.k12.ca.us

AP Psychology (elective)

The AP Psychology course introduces students to the systematic and scientific study of human behavior and mental processes. While considering the psychologists and studies that have shaped the field, students explore and apply psychological theories, key concepts, and phenomena associated with such topics as the biological bases of behavior, sensation and perception, learning and cognition, motivation, developmental psychology, testing and individual differences, treatment of abnormal behavior, and social psychology. Throughout the course, students employ psychological research methods, including ethical considerations, as they use the scientific method, evaluate claims and evidence, and effectively communicate ideas.

Prerequisite: There are no prerequisites for AP Psychology. Students should be able to read a college-level textbook and write grammatically correct, complete sentences.

Teacher: Trina Plummer tplummer@pittsburg.k12.ca.us

AP Environmental Science (elective)

The AP Environmental Science course is designed to be the equivalent of a one-semester, introductory college course in environmental science, through which students engage with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world. The course requires that students identify and analyze natural and human-made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them.

Environmental Science is interdisciplinary, embracing topics from geology, biology, environmental studies, environmental science, chemistry, and geography.

Laboratory Requirement: Although there are no specific AP Environmental Science labs or field investigations required for the course, it is expected that students perform as many labs/field investigations as possible.

Prerequisites: Students should have completed two years of high school laboratory science — one year of life science and one year of physical science (for example, a year of biology and a year of chemistry). Due to the quantitative analysis required in the course, students should also have taken at least one year of algebra.

Teachers: Thomas Arbuckle tarbuckle@pittsburg.k12.ca.us

AP Computer Science Principles (elective)

The AP Computer Science Principles course is designed to be equivalent to a first-semester introductory college computing course. In this course, students will develop computational thinking vital for success across all disciplines, such as using computational tools to analyze and study data and working with large data sets to analyze, visualize, and draw conclusions from trends. The course is unique in its focus on fostering student creativity. Students are encouraged to apply creative processes when developing computational artifacts and to think creatively while using computer software and other technology to explore questions that interest them. They will also develop effective communication and collaboration skills, working individually and collaboratively to solve problems, and discussing and writing about the importance of these problems and the impacts to their community, society, and the world.

Prerequisites: It is recommended that a student in the AP Computer Science Principles course should have successfully completed a first year high school algebra course with a strong foundation on basic linear functions and composition of functions, and problem solving strategies that require multiple approaches and collaborative efforts. In addition, students should be able to use a Cartesian (x, y) coordinate system to represent points in a plane. It is important that students and their advisers understand that any significant computer science course builds upon a foundation of mathematical and computational reasoning that will be applied throughout the study of the course

AP Computer Science (elective)

AP Computer Science A is equivalent to a first-semester, college level course in computer science. The course introduces students to computer science with fundamental topics that include problem solving, design strategies and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing. The course emphasizes both object-oriented and imperative problem solving and design using Java language. These techniques represent proven approaches for developing solutions that can scale up from small, simple problems to large, complex problems.

The AP Computer Science A course curriculum is compatible with many CS1 courses in colleges and universities.

Lab Requirements: The AP Computer Science A course must include a minimum of 20 hours of hands-on structured lab experiences to engage students in individual or group problem solving. Thus, each AP Computer Science A course includes a substantial laboratory component in which students design solutions to problems, express their solutions precisely (e.g., in the Java programming language), test their solutions, identify and correct errors (when mistakes occur), and compare possible solutions.

Prerequisites: Students should be comfortable with functions and the concepts found in the uses of function notation, such as $f(x) = x + 2$ and $f(x) = g(h(x))$. It is important that students and their advisers understand that any significant computer science course builds upon a foundation of mathematical reasoning that should be acquired before attempting such a course.

Teacher: Romeo Simionas rsimionas@pittsburg.k12.ca.us