

A big blue
transformative
SUMMER
living & learning
at Phillips Academy

UPPER SCHOOL COURSE CATALOG
SUMMER 2022

Andover Summer 2022 Upper School

Our Upper School is designed for rising 9th-12th graders (or ages ~14-17) seeking an enriching summer academic experience supplemented with afternoon activities and weekend trips to local destinations. Upper School students can select from over 60 course options, each taught by a member of our distinguished summer faculty. The Upper School provides the rigorous academic environment our students seek, while providing a nurturing and supportive community of learners. During the application process, all students select a specific program to which they are applying. For students entering grades 9-12, students have the option of selecting either the Upper School or English Language Learners Institute.

Upon enrollment, students and parents will submit their course requests through the Parent Portal. When selecting courses, please enroll in both a Period 1 and Period 2 course. Period 2 courses may meet during the 2a or the 2b time slots; specific course times and locations will be communicated upon arrival.

Boarding students are required to enroll in two courses, while day students may select one or two course periods.

In the pages that follow you will find the full range of possible Upper School courses that are currently being offered for the summer of 2022. Please note that final course offerings are dependent upon enrollment and staffing, and courses with insufficient enrollment may be cancelled at any point prior to the start of the summer. Students enrolled in a course that is being cancelled will be notified and given the opportunity to enroll in an alternate course, based on what remains available at that time. Course enrollment is a first-come, first-served process, with our most popular courses and programs typically filling up in February or March each year. Additionally, changing public health conditions may require us to adjust our program schedule or course offerings, of which we will notify enrolled families via email and through our website.

New for 2022 is the Andover Summer 9th Grade Academy, an intensive cohort experience designed to help students make a successful transition from middle to high school. Serving rising 9th grade students seeking a more structured, comprehensive high school preparation experience this summer, the program is described in detail on page 17.



REGULAR DAILY SCHEDULE

Summer Session—Upper School Institute

MONDAY	
7–9 a.m.	Breakfast available
8:30–10 a.m.	Period 1
10:30 a.m.–12:00 p.m.	Period 2A
11 a.m.–1:30 p.m.	Lunch available
12:30–2 p.m.	Period 2B
2:10–3:10 p.m.	College Counseling
3:30–4 p.m.	All-School/Cluster Meeting (chapel or cluster location)
4:15–5 p.m.	Optional Clubs
5–6:45 p.m.	Dinner available
6:15–7:15 p.m.	Evening period
7:30 p.m.	Initial Dorm Sign-In
7:30–9:30 p.m.	Study Hours
9:30 p.m.	Final Dorm Sign-In
10:30 p.m.	Students in their rooms

TUESDAY, THURSDAY, FRIDAY	
7–9 a.m.	Breakfast available
8:30–10 a.m.	Period 1
10:30 a.m.–12:00 p.m.	Period 2A
11 a.m.–1:30 p.m.	Lunch available
12:30–2 p.m.	Period 2B
2:10–3:10 p.m.	College Counseling
3:30–5:30 p.m.	Afternoon Activities
5–6:45 p.m.	Dinner available to all
6–7:30 p.m.	Evening period
7:30–9:30 p.m.	Study Hours
9:30 p.m.	Final Dorm Sign-in
10:30 p.m.	Students in their rooms

WEDNESDAY	
7–9 a.m.	Breakfast available
8:30–9:45 a.m.	Period 1
10:00–11:15 a.m.	Period 2
11 a.m.–1:30 p.m.	Lunch available
11 a.m.–6 p.m.	Optional College Trips
5–6:45 p.m.	Dinner available
6:00–7:30 p.m.	Evening period
7:30 p.m.	Initial Dorm Sign-in
7:30–9:30 p.m.	Study Hours
9:30 p.m.	Final Dorm Sign-in
10:30 p.m.	Students in their rooms

SATURDAY	
7–9 a.m.	Breakfast available
8:30–10 a.m.	Period 1
10:30 a.m.–12:00 p.m.	Period 2
11 a.m.–1:30 p.m.	Lunch available
1:00 p.m.–6 p.m.	Optional Trips
5–6:45 p.m.	Dinner available
7:30 p.m.	Initial Dorm Sign-in
7:30–10:30 p.m.	Optional Student Activities
11 p.m.	Final Dorm Sign-in
11:45 p.m.	Students in their rooms

SUNDAY	
8–10:30 a.m.	Breakfast available
10:30 a.m.–1:30 p.m.	Brunch available
1 p.m.–6 p.m.	Optional Student activities/trips
5–6:45 p.m.	Dinner available to all
7:30 p.m.	Initial Dorm Sign-in
7:30–9:30 p.m.	Study Hours
9:30 p.m.	Final Dorm Sign-in
10:30 p.m.	Students in their rooms

ARTS - VISUAL AND PERFORMING

Acting and Performance

Grades 9–12 | PERIOD 2

Working from the ground up, students learn how to use their minds, bodies, and voices as professional actors do. Beginning with physical and vocal exercises, improvisation games, and other ensemble-building workshops, the course then moves on to more advanced acting techniques. Students explore some of the most influential theatre styles, plays, and characters—as well as creating their own—through rehearsal and in-class presentation, culminating in a public performance of their work from the summer. No prior theatre experience necessary; this class is equally suited for beginners or performance pros.

Applied Graphic Design

Grades 9–12 | PERIOD 2

Have you ever tried to design a poster, flyer, business card, yearbook, or class presentation and been stymied by the considerable choices you must make? In our information-driven society, graphic design principles and concepts are needed more than ever to bring balance, clarity, and visual appeal to all varieties of content. According to noted graphic designer Paul Rand, “To design is much more than simply to assemble, to order, or even to edit; it is to add value and meaning, to illuminate, to simplify, to clarify, to modify, to dignify, to dramatize, to persuade, and perhaps even to amuse. To design is to transform prose into poetry. Design broadens perception, magnifies experience, and enhances vision. Design is the product of feeling and awareness, of ideas that originate in the mind of the spectator.”

**Cross-listed under Computer Science*

NEW! Art as Action: Murals of the 21st Century

Grades 9–12 | PERIOD 1

Are you curious about artwork that says something? Today’s artists are often motivated to create public works of art in response to topics such as the meaning of ‘community’ and various social justice causes. Come explore the issues that matter to you and collaborate with fellow students to create large scale artworks, while sharing your personal experiences with others! Learn about the history of murals, how to interpret the visual elements within and see examples from around the world and locally. Understand visual art concepts such as proportion, scale, perspective, color theory and composition. Learn acrylic paint techniques on panels and proudly display your efforts for the Andover Summer community at large!

Ceramics

Grades 9–12 | PERIOD 2

This course discusses the elements of three-dimensional design and focuses on the creative potential of the student. *Ceramics* at Phillips Academy is comparable to ceramics courses taught at art schools and select universities; the Academy is equipped with facilities for pit firing, high fire gas, and Raku. Techniques, glazes, and firing procedures are introduced with the support of books, slides, and visits to the campus’s Addison Gallery of American Art and Robert S. Peabody Museum of Archaeology.

Digital Photography

Grades 9–12 | PERIOD 2

Students learn the basics of photography and how to use digital cameras, then scan their images into Adobe Photoshop, where they can transform them by adding color and using the program's many altering techniques. Through this class, students gain an understanding of photography and how technology can improve their images. The ultimate challenge is for students to push their creative limits. Students are encouraged to bring a digital camera; those who do not have one are welcome to borrow one for the duration of the program.

Drawing and Painting

Grades 9–12 | PERIOD 1

The fundamental elements of drawing—line, shape, value, perspective, and composition—are emphasized in the initial weeks of this course. Students are introduced to a variety of materials (graphite, charcoal, ink, and acrylic) through a series of exercises that celebrate drawing as a creative act. From drawing, students can expand into the realm of painting and mixed media, working from a variety of approaches.

Intensive Film Workshop

Grades 9–12 | PERIOD 1

This course is for students interested in making a serious commitment to expressing themselves through the motion picture. This intensive program leads students through an exploration of each aspect of filmmaking, from the conception of an idea to the final steps in editing. The course is segmented to include film development, pre-production scheduling, production, and editing. Students explore the genre of the fiction film, studying the styles and techniques of various filmmakers. Projects are

produced using some of today's most technologically advanced materials and systems, available on campus in the Polk-Lillard Electronic Imaging Center. Students gain a greater film/video vocabulary as well as a technical background allowing them to continue with filmmaking.

Studio Art

Grades 9–12 | PERIOD 2

Do you want to become a better artist? Would you like to create a body of quality artwork that can be used later in a college portfolio? Learn the tools of the studio artist. Through study of the elements and principles of design, students will create various works of art using a variety of media. Techniques in painting, drawing, printmaking, and computer design are the course's primary focus. Classic subjects such as portraits, still lifes, landscapes, and the figure will comprise much of the subject matter in this class. Students will watch art films and visit local galleries to supplement the curriculum.

Web Design and Advanced Computer Graphics

Grades 9–12 | PERIOD 1

Cross-listed under *Computer Science*, see full course description under *Computer Science*.

COMPUTER SCIENCE

Introduction to Programming

Grades 9–12 | PERIOD 2

This course provides an introduction to computer programming for students with no previous programming experience. Students explore the basics of computer programming while creating animations, games, and simulations. Topics include object-oriented programming, variables, decisions, events, and the basics of game design in a graphical environment. Students do not need a strong high school math background, making this an ideal course for younger students. Though the course is not taught with a traditional programming language, all concepts can be transferred to other object-oriented languages, such as Java and Visual Basic.

NEW! Game Design and Development

Grades 9–12 | PERIOD 2

You know how to play games on Xbox, Playstation, Nintendo and your mobile device but did you ever wonder how to build one yourself? The game design industry is an exciting, expanding field that requires both technical and creative ability. Dive into this interactive course where you'll learn ways to create and describe a game concept, and specifically investigate what makes a compelling game design. Students will work with their instructors to construct board games and computer-based games, design characters, build terrains, and improve the interactive user experience. If you are passionate about gaming, like working with others, and have a big imagination – this is the course for you!

Programming in Java

Grades 9–12 | PERIOD 1

Intended as an introduction to computer programming using traditional coding methods, this course emphasizes methodology, algorithms, data structures, code style, and the Java programming language, as suggested by the College Board for the Advanced Placement (AP) Computer Science exam. Students learn to design and implement computer-based solutions to a variety of problems. In addition, students design programs that are expandable and understandable, and they learn how and when to write code that is reusable. Although this is not an official AP course, students are exposed to most of the topics covered on the AP Computer Science exam and will learn how to create small, structured programs using the Java language.

**Prerequisite: Successful completion of Algebra II*

Robots: Design! Build! Program!

Grades 9–12 | PERIOD 1 and PERIOD 2

Welcome to the world of competitive robotics. Science, math, engineering, creativity, and logic are combined in this exciting introductory robotics and robotics programming course, cross-listed under science. Students will be introduced to the upcoming season of the Vex Robotics Competition, a world-wide competition engaging students in more than 30 countries. Using the new V5 Robot Brain, V5 Controller, Vex Robotics System, and Vex Coding Studio, students will work in teams to design, build, and program robotic solutions to the new season of Vex Robotics Competition. Teams test their solutions to the challenge, on "game day", giving beginners and seasoned roboticists alike the experience of being on a development team for competitive robotics.

Web Design and Advanced Computer Graphics

Grades 9–12 | PERIOD 1

This course introduces students to the fundamentals of design on the computer and concentrates on software programs to enhance their skills. Using the computer as a creative tool, students blend photography, type, sound, video, animation, and interactivity. While studying various artists who utilize different media to understand the elements of design, students develop computer skills to express themselves visually. Students work on various projects, creating digital collages, a short movie, and a website that incorporates animation and sound.

**Cross-listed under Arts and Performing Arts*

ENGLISH

Contemporary Authors

Grades 9–12 | PERIOD 1

This course offers students the opportunity to develop an in-depth understanding and appreciation of a range of different writers. It focuses on students' abilities to read novels, plays, short stories, and/or essays actively and to write articulately. This critical reading and writing course challenges students to confront a variety of written and visual texts and encourages them to see writing as a valuable tool. It helps them see themselves as independent thinkers and teaches them how to give voice to their thoughts through the written word. A variety of books and authors will be examined.

Digital Journalism

Grades 9–12 | PERIOD 2

This course is for students who want to explore the intersection between storytelling, technology, and traditional reporting. Students will engage a variety of digital platforms—from social media to podcasts to online magazine articles—to develop stories that engage both reason and emotion. Daily reading and writing exercises will help students expand their repertoire of rhetorical strategies, learn to analyze audiences, and determine which digital platforms are most appropriate for various situations. Students will gain experience in field reporting and conducting research, and they will build a digital portfolio of work over the course of the program.

NEW! High School Prep–English

Grade 9 Only | PERIOD 1 and PERIOD 2

This course may only be selected by those participating in the full 9th Grade Academy cohort. Please see full description under 9th Grade Academy.

Literature in Translation

Grades 10–12 | PERIOD 1

This course includes a close study of works of world literature, emphasizing the literary, cultural, and human significance of selected great works of the Western and non-Western literary traditions. An important goal of the class is to promote an understanding of the works in their cultural/historical contexts and of the enduring human values which unite the different literary traditions, as well as to encourage students to bring their own cultural experiences to bear on the texts. The course gives special attention to critical thinking and writing within a framework of cultural diversity as well as comparative and interdisciplinary analysis.

Screenwriting

Grades 9–12 | PERIOD 1

This class serves as introduction to the craft of cinematic writing. Screenwriting rewards risk-taking and finding your own personal voice; through in-class workshops, rapid writing prompts, and long-form assignments, students will develop this voice by exploring the concepts of character, dialogue, dramatic conflict, and narrative structure. By also exploring and analyzing plays by professional playwrights and screenwriters, students will gain an understanding of the variety of voices producing plays in the cinema today. The capstone project of the class will be a ten-minute screenplay written by each student.

Speech and Debate

Grades 10–12 | PERIOD 1 and PERIOD 2

In a survey, 3,000 Americans were asked what they dreaded most. Public speaking came in first—ahead of death! In an encouraging classroom atmosphere, students are taught to improve both the delivery and the content of their public speaking. Students write, revise, and speak extensively and are introduced to competitive high school speech activities, such as extemporaneous speaking, impromptu speech, and Lincoln-Douglas debate. Close analysis of contemporary American political speeches and research of cutting-edge controversial topics provide issues for classroom debate. Students develop an invaluable skill that will serve them for the rest of their lives. This course assumes no prior knowledge of public speaking or debate.

Writing for Success: Creative Writing

Grades 9–12 | PERIOD 1 and PERIOD 2

This course is for students who think of writing as an art, not just a useful skill. Students read and write in several genres—short story, poetry, and nonfiction memoir—using the readings as models for their own work. In their writing, students are expected to develop mastery of fundamental techniques of good writing, from basic grammar and usage to metaphorical language and plot structure. Required to write daily, revise, and produce polished final drafts as well as share in class, students begin to transform raw talent into true skill.

Writing for Success: Expository Writing

Grades 9–12 | PERIOD 1 and PERIOD 2

The most important writing course students will ever take and the most sought-after writing course at Andover, Writing for Success emphasizes essay composition as a craft and exposes students to different uses and combinations of rhetorical modes, including definition, description, narration, process, comparison, and analysis. Over the course of the program, students practice constructing effective sentences and paragraphs to suit a variety of topics, audiences, and aims. By writing every day as well as reading and discussing the style and mechanics of published essays, students experience writing as a rewardingly rigorous, recursive, and creative process that involves brainstorming, planning, composing, editing, reverse outlining, and constructive peer review.

Writing for Success: Literary Analysis

Grades 9–12 | PERIOD 1 and PERIOD 2

This course offers students the opportunity to develop an in-depth understanding and appreciation of a range of different writers. It focuses on students' abilities to read novels, plays, short stories, and/or essays actively and to write articulately. This critical reading and writing course challenges students to confront a variety of written and visual texts and encourages them to see writing as a valuable tool. It helps them see themselves as independent thinkers and teaches them how to give voice to their thoughts through the written word. A variety of books and authors will be examined.

Writing for Success: Reading Images

Grades 9–12 | PERIOD 2

The twenty-first-century world is saturated with images. They fill our homes, surround us in public spaces, and decorate our bodies. We are active consumers and producers of an increasingly digital visual culture, as we click, upload, like, and share. But what do all these pictures mean? How are we to understand our encounters with the visual world and communicate them to others? In this critical writing course, students acquire an essential set of skills known as visual literacy, as they learn to read and write about popular visual media and objects at the Addison Gallery of American Art. Each week focuses on a new way of looking closely and translating those observations into analytical, persuasive, or research-based writing. Students will leave the course with a portfolio of essays that showcases their ability to ask critical questions, evaluate texts and contexts, and communicate their meaning in writing.

Writing the College Essay

Grades 10–12 | PERIOD 1 and PERIOD 2

This course will move students through the brainstorming, drafting, and revision process to create a set of polished essays that can be used during the college application process. Focusing on the prompts released by the Common Application as well as addressing common short-answer questions, this course will support students in creating essays that represent their individual personalities and ambitions. Students will be required to write daily, participate in workshop activities and critiques, and reflect on their own life experiences.

HISTORY AND SOCIAL SCIENCE

NEW! Entrepreneurship

Grades 10–12 | PERIOD 2

Entrepreneurship has become an established life and career path for many. Yet relatively few embark on this journey with the tools and techniques needed to prepare the way and to avoid its many pitfalls. At the same time, many people's image of entrepreneurship comes from shows like *Shark Tank* and *The Apprentice* – a Darwinian, zero-sum game where people vie for scarce investment dollars and seem fixated on making a million – scratch that – a billion dollars. Yet this is a very limited view of entrepreneurship and the possibilities it offers. Entrepreneurship aims to fill this gap in knowledge and perspective by taking a holistic view, embodying Andover's non sibi philosophy, and exposing participants to multiple forms of entrepreneurship, extending beyond for-profit ventures into cause-related, educational, and nonprofit ventures. Taking a hands-on approach, each participant will create three business plans during the summer, one in each of three areas: for-profit, nonprofit, and personal initiative/personal brand. We will focus on practical skills development and will introduce participants to professionals who are active and successful in the field. Come cultivate your ideas with us!

Great Issues and Controversies of the Modern World

Grades 10–12 | PERIOD 2

This course takes an in-depth look at important global issues by using the critical skills of reading, writing, and analysis to view a specific topic as well as utilizing on-campus resources such as the Peabody Museum of Archaeology and the Addison Gallery of American Art. Students improve their writing skills through exams, essays, and papers; their speaking skills through in-class discussions; and their analytical skills through readings and debates. They not only increase their knowledge of contemporary issues, but also sharpen the learning tools that are necessary in any discipline. The overarching goals are to learn more about the world, apply the material to improve their skill objectives, and continue to follow world events beyond this Summer Session course.

History of Terrorism

Grades 9–12 | PERIOD 1

From the assassination of Archduke Franz Ferdinand, which led to WWI, to 9/11, which led to the current wars in Afghanistan and Iraq, terrorism has helped to shape the modern world. Almost every country has experienced terrorism, and the topic commands headlines and political campaigns. This course looks at the past and present of terrorism in order to help students understand what terrorism is, why it exists, and where the world should expect to see terrorist acts in the future. Students will learn about the history of terrorism, studying the groups and major campaigns of the past 200 years, and will use current events to better grasp this complex topic. This course is reading and writing-intensive as well as utilizing student-led discussions. This is an intense topic, and some of the material may be upsetting. However, knowledge is the only way to confront terrorism, and students will leave this course better able to understand the world they live in.

International Relations

Grades 9–12 | PERIOD 1

This course is designed to stimulate students' interest in international relations and foreign policy. As a result of their experiences in the class, they become more astute observers of the international scene and learn to better understand the problems facing the world today. Emphasis is placed on both the historical background and the realities of the modern world scene. Students are assigned readings and gain considerable experience in utilizing library sources emphasizing a variety of viewpoints. Much attention is given to the development of critical thinking, and a large portion of the course is devoted to activities that promote student involvement. Students engage in seminars; serve as prosecutors, defenders, and court members in mock World Court cases; and become involved in a major simulation modeled on the United Nations, utilizing debate, negotiation, compromise, and decision-making skills.

Law and Society

Grades 9-12 | PERIOD 1 and PERIOD 2

In this course, students will learn about the foundations of the American legal system and how they apply to social, economic, political, and individual issues. We will delve into issues of law, crime prevention, conflict resolution, advocacy, and human rights through a combination of case studies, legal analyses, and mock trials. This class will study several landmark cases from the American legal system's history and explore their impact on our society, while considering how the precedents set in these cases apply to current issues. If you love discussion, if legal issues intrigue you, if you're thinking about studying law, or if you just want to look at society from a new point of view, this is the class for you.

Medicine and Society

Grades 9–12 | PERIOD 1

The coronavirus pandemic of 2020 has offered a harsh reminder of how much societies around the world depend on medicine. At the same time, it has underscored the ways in which medical challenges—from disease treatment to healthcare access—are intricately connected to social values, assumptions, and structures. To make sense of the contemporary moment, therefore, we must ask why social groups have experienced disease and medicine differently across history; how the epidemiological origins of a disease shapes social perceptions of people and places; and how a medical crisis can generate social change, such as widespread calls for racial justice. Students will apply critical and international perspectives to the relationship between modern medicine and society by exploring important case studies in public health and reflecting on their own medical experiences. Together we will analyze representations of medicine in scientific literature, non-fiction, news reports, popular media, film, and art. These sources, along with field work on the Andover campus, will inspire students' in-class debates, critical writing, personal narratives, and independent research.

Money, Economy, and Society

Grades 9–12 | PERIOD 1 and PERIOD 2

Our lives are impacted by economic forces in surprising and powerful ways. Learn to appreciate these forces and you'll make smarter personal decisions and better sense of the world around you. What constitutes a "fair price" when you purchase a new iPhone? Why is LeBron James paid forty million dollars a year to play basketball when a nurse or firefighter is paid forty thousand dollars a year to save human lives? Is it possible to bring manufacturing jobs back to America by placing tariffs on Chinese imports? Can we reduce income inequality by taxing the rich and writing checks to the poor? Why is a stay-at-home-mom who cares for her children and cleans the house classified by economists as "unproductive"? To answer these and many more questions, we trace the main currents of economic thought from Adam Smith and Karl Marx to Marilyn Waring and Thomas Piketty.

NEW! Neuropsychology

Grades 10–12 | PERIOD 2

Cross-listed with Science. See full description in Science.

Personal Finance

Grades 9–12 | PERIOD 1 and PERIOD 2

Cross-listed under Mathematics, this course aims to develop students' financial literacy skills, emphasizing real-world applications of mathematics in the areas where students will need to be most skilled when they become financially independent. Budgeting, learning to borrow and invest wisely, understanding the stock market and basics of investing, and planning for major purchases and life events will all be covered. Through a combination of reading, research, simulation activities, projects, and data analysis, students will learn to prepare for their financial futures.

The Politics of Migration and Displacement

Grades 10–12 | PERIOD 1

More people than ever flee political conflict and persecution, poverty, and climate change-related disasters. In search of livelihoods and safety, migrants find themselves at risk of becoming victims of smugglers or traffickers. In light of an ongoing humanitarian focus on issues of displacement and migration, this course will provide students with historical background and relevant context through an academic lens. Students gain an enhanced understanding of the complex interaction between migration and humanitarian interventions from multiple points of view, including migrants, host communities, hosting authorities, and the humanitarian sector. Students will engage with academic material about the history of humanitarian responses to displacement; drivers of migration; durable solutions; among other topics. They will also learn from migration theory and case studies depicting situations of displacement around the world.

Social Psychology

Grades 9-12 | PERIOD 1

This course is an introduction to the theories and applications of social psychology in research, academic and social settings. Through class activities and discussions, students experience and reflect on constructs of social psychology that they will have read about in scientific settings. Students are also involved in discussing the relevance of gender and ethnic diversity in the construction of social values, with specific focus on their own lives and experiences. Topics include group dynamics, conformity, self-knowledge, attitude formation and change, interpersonal attraction, prejudice, and aggression.

MATHEMATICS

Calculus*

Grades 11–12 | PERIOD 1

This course is for students who have successfully completed two years of algebra and a yearlong precalculus course that includes trigonometry. It is an accelerated mathematics course for strong math students and covers many of the topics in the Advanced Placement curriculum, including limits and continuity, derivatives and their applications, indefinite and definite integrals, techniques and applications of integration, and the Fundamental Theorem of Calculus.

**Prerequisite: successful completion of two years of algebra and one year of trigonometry*

Geometry*

Grades 9–12 | PERIOD 1 and PERIOD 2

For students who have had a strong elementary algebra course but no geometry, this course is a thorough study of the fundamentals of geometry. The development of logical, structured proofs and deductive reasoning is emphasized. Along with numerical solutions to problems, topics include basic postulates of geometry, lines and angles, congruent triangles, parallel lines in the plane and in space, quadrilaterals and polygons, circles, similar triangles and other figures, and the Pythagorean Theorem.

**Prerequisite: successful completion of one year of algebra*

NEW! High School Prep Institute: Math

Grade 9 Only | PERIOD 1 and PERIOD 2

This course may only be selected by those participating in the full 9th Grade Academy cohort. Please see full description under 9th Grade Academy.

Personal Finance

Grades 9–12 | PERIOD 1 and PERIOD 2

This course is cross-listed. See full course description under *History and Social Science*.

Statistics and Data Analysis*

Grades 11 and 12 | PERIOD 1

This course covers the exploratory analysis of data, making use of graphical and numerical techniques to study patterns and developing plans for data collection of valid information. Topics include probability as the tool for producing models, random variables, independence, normal distribution, simulation, sampling, statistical inference, confidence intervals, and tests of significance.

**Prerequisite: successful completion of one year of algebra*

Topics in Algebra*

Grades 9-10 | PERIOD 2

This course reviews and reinforces math skills found in the pre-algebra and Algebra I curriculum. It should provide a solid foundation for Algebra II and Intermediate Algebra. Topics include several fundamental concepts of Algebra, graphing and solving linear and quadratic functions, solving systems of linear equations and properties of exponents.

**Prerequisite: successful completion of one year of algebra*

Topics in Advanced Algebra and Precalculus*

Grades 11 and 12 | PERIOD 1

This course focuses on pre-calculus topics, which are prerequisites for calculus and necessary for success in subsequent mathematics courses. Topics covered will include linear systems of equations, linear functions, quadratic functions, polynomial functions, logarithmic functions, and radical functions. Additional topics may include sequences and series, counting and probability, matrices, and partial fractions. A graphical calculator will be used in class, enabling students to gain both a graphical and an algebraic understanding of concepts.

**Prerequisite: successful completion of algebra I and algebra II*

Topics in Intermediate Algebra*

Grades 10 and 11 | PERIOD 2

This course reviews and reinforces math skills found in the Algebra II curriculum. It should provide a solid foundation for pre-calculus. Topics include solving linear equations and inequalities and absolute value equations and inequalities. A study of linear functions will be followed by polynomials and rational expressions. An in-depth study of quadratic functions may be followed by exponential and logarithmic functions, time permitting.

**Prerequisite: successful completion of one year of algebra*

Trigonometry*

Grades 10–12 | PERIOD 2

This course offers a comprehensive study of circular and trigonometric functions. Topics include radian measure, trigonometric equations, solving right triangles, graphing trigonometric functions, inverse trigonometric functions, law of sines, and law of cosines. Trigonometry will be used to model real-life applications.

**Prerequisite: successful completion of one year each of algebra and geometry*

**Students requesting a math course will be required to take an online placement exam to assess math level & ability*

PHILOSOPHY AND RELIGION

Introduction to Philosophy

Grades 10–12 | PERIOD 1

Philosophy has been around for a long time, but what is it? This course is for anyone who has ever wondered what philosophy is about, as well for those who would like to deepen what they may already know about it. Everyone thinks, but not everyone thinks philosophically. Over the millennia, philosophers have come up with questions, ideas, and methods that allow us to look beneath the surface of things, examine our preconceptions, and gain new insights about ourselves and the world we live in. This course is about what it means to do this. We will watch philosophical films and read the works of many famous philosophers like Plato, Aristotle, René Descartes, John Locke, and Immanuel Kant. We will also take a field trip to Walden Pond, where Henry David Thoreau, one of America's great thinkers, conducted a famous philosophical experiment. Most of all, we will think, talk, and have fun exploring the fascinating world of ideas.

Justice and Ethics

Grades 10-12 | PERIOD 2

Few ideas have been more powerful in human history than the idea of justice. This idea has been central to the ways that human societies function and think of themselves—not just governments and legal systems but also religious communities, social movements, and individuals. Though the quest for justice is one of humanity's oldest aspirations, it remains a powerful ideal today. In this course, we will examine the idea of justice in connection with the human quest to live a morally worthy life. We will look first at the origins of justice in classical thought and in long-standing religious traditions. This will help us to understand how and why people today conceptualize—and argue about—justice in the way that they do. In the second half of the course, we will use concepts in moral philosophy to consider the ethical backgrounds of environmentalism, human rights theory, and contemporary social justice movements.

SCIENCE

Anatomy and Physiology

Grades 11 and 12 | PERIOD 1

This course focuses on the anatomical and physiological workings of the human body. Among the anatomy and physiology topics introduced are histology, kinesiology, cardiology, and genetics. Students learn to identify anatomical structures and their functions in relation to daily bodily activities. Student work is assessed through written reports, examinations, lab practicals based on dissection, and research topics. Students have the opportunity to leave this course with their own portfolio of materials that are focused on topics introduced in the class setting.

Applied Physics: Astronomy

Grades 9–12 | PERIOD 1 and PERIOD 2

Modern astronomy is a quest for a greater understanding of the evolution and diversity of the universe, as well as an application of critical thinking skills to broader questions in physics, chemistry, biology, and environmental science. This class examines the current state of the science as well as future avenues of research and discovery. Topics include traditional areas of emphasis, such as the electromagnetic spectrum, light, telescopes, navigating the night sky, solar system formation, the planets, global climate change, comets and asteroids, the sun, and the lifecycle of stars. We also apply a critical analysis to the broader questions that include the search for life in the universe and connections to life on this planet. We keep a close eye on current research and examine the history of science through the eyes of non-conventional thinkers, including Einstein and Galileo. Lastly, we examine some of the more exotic subjects that are stretching the limits of modern science, such as black holes, ion propulsion, dark energy, and life in extreme environments. We make use of the extraordinary imagery and resources available here at Phillips Academy, including the state-of-the-art observatory in Gelb Science Center. Throughout the session, students engage the science critically and capture a snapshot of this emerging field of science.

Biology: First Year

Grades 9–12 | PERIOD 1

This is an intensive introductory lecture, laboratory, and field course designed to investigate and explore biological concepts and principles. Units covered include ecology, plant biology, animal diversity, concepts of animal structure, and cellular biology. Scientific writing is an ongoing focus. The framework anchors in a student's conceptual understanding of biology with an emphasis on biology as a process rather than an accumulation of facts.

Biology: Prep for Advanced Placement

Grades 10–12 | PERIOD 2

This is a pre-AP course designed to introduce students to the rigors of a college level laboratory course in general biology. The framework of the course is a student's conceptual understanding of biology. However, emphasis is placed on biology as a process, rather than an accumulation of facts. Laboratory work and skills in scientific writing will be developed. A few of the units students will cover include: Writing in Biology, Membrane Structure and Function, The Cell Cycle, Transport in Plants, and Animal Behavior.

**Prerequisite: one year of biology*

Chemistry: First Year

Grades 10–12 | PERIOD 1

This course is geared toward highly motivated students who show an interest in science and have demonstrated strong mathematical and conceptual abilities. As an introduction to chemistry, this intensive course teaches students essential chemical principles, such as stoichiometry; atomic and molecular structure; chemical bonding theories; and the properties of gases, liquids, solids, and solutions. The fundamental concepts of chemical equilibrium and acid-base chemistry also are presented, and students are introduced to electrochemistry. The course is balanced by a combination of lectures, problem-solving, and laboratory work, providing a strong foundation in chemistry.

**Prerequisite: successful completion of one year of algebra*

**Requirement: Texas Instruments TI-84 graphing calculator or its equivalent*

Chemistry: Prep for Advanced Placement

Grades 10–12 | PERIOD 2

This course is intended for highly motivated students who are getting ready to take an AP Chemistry course and have demonstrated strong mathematical and conceptual abilities. Students review essential chemical principles, such as stoichiometry; atomic and molecular structure; chemical bonding theories; and the properties of gases, liquids, solids, and solutions. The very fundamental concepts of chemical equilibrium and acid base chemistry also are presented, and students are introduced to the topic of electrochemistry. The course is balanced by a combination of lectures, problem-solving exercises, and laboratory work. Utilizing a college-level textbook, the course covers topics at a depth equivalent to that of an introductory college chemistry course.

**Prerequisite: successful completion of one year of algebra and one year of chemistry*

**Requirement: Texas Instruments TI-84 graphing calculator or its equivalent*

Environmental Science

Grades 9–12 | PERIOD 2

Climate change, species extinction, devastating tropical storms, and nuclear disasters—all of these topics and more will be explored through our introduction to the interdisciplinary field of environmental science and social justice. Students learn scientific methodology through hands-on biology- and ecology-based lab investigations using the 500-acre Phillips Academy campus as well as the rich diversity of ecosystems within a short drive of the school. Students also will use class time and field work to study the environment in terms of history, social context, economics, and sustainability. Students will identify and analyze environmental problems (both natural and human-made) and examine possible solutions for resolving and/or preventing them.

Genetics

Grades 10–12 | PERIOD 2

This rigorous course studies the profound implications of recent advances in genetics. It will begin with a review of the structure and function of DNA in addition to the basics of Mendelian genetics. Further exploration of the topics will lead to a deeper understanding of genetic diseases, cancer, evolution, and the new field of epigenetics. The course considers methods of detecting genetic defects and genetic engineering and includes discussions of the ethical implications of both. A significant portion of this course will include work in the lab with a variety of techniques.

**Prerequisites: successful completion of one year of biology and one year of chemistry*

Marine Biology

Grades 9–12 | PERIOD 2

Students are introduced to several different aspects of marine biology through lectures, laboratory investigation, and field trips. Topics include, but are not limited to, oceanography, marine invertebrate, and vertebrate zoology (including physiological adaptations to a marine environment), aquaculture, and ecology of the various habitats within aquatic ecosystems. We examine the physical and chemical properties of seawater, organisms that have evolved to an aquatic environment, the physiological and behavioral adaptations those organisms have developed, and the different ecosystems within oceanic zones.

NEW! Neuropsychology

Grades 10–12 | PERIOD 2

Come explore the neurological basis for how our brain impacts everyday behavior. Students enrolled in this course will study the relationship between the brain, nervous system structures, and behavior. Students will learn about basic brain anatomy and function as well as cognitive disorders and behavioral disorders from a neuropsychological perspective. Students will engage in an exploration of how everyday behaviors, such as using a cellular phone impact nervous system function, their own behaviors, and the behaviors of those around them. Students will have the opportunity to take a more in-depth look at an area of their choosing. Topics range from the study of Alzheimer's and Parkinson's to the more controversial subject of CTE in NFL athletes.

This course is cross listed with History and Social Science

Physics: First Year

Grades 9–12 | PERIOD 2

This course covers the main ideas of mechanics and provides a solid foundation of concepts, confidence in problem solving, and exposure to laboratory techniques. Although this course does not cover a full year's worth of material, the techniques learned serve as excellent preparation for all introductory physics topics.

Requirement: Texas Instruments TI-84 graphing calculator or its equivalent

**Prerequisite: successful completion of one year of algebra*

Physics: Prep for Advanced Placement

Grades 10–12 | PERIOD 1

This course is an algebra-based, introductory physics course, intended to prepare students for Advanced Placement. Students cultivate their understanding of physics through classroom study, in-class activity, and hands-on, inquiry-based laboratory work as they explore concepts like systems, fields, force interactions, change, conservation, and waves. By confronting complex physical situations or scenarios, the course is designed to enable students to develop the ability to reason about physical phenomena using important science practices, such as explaining relationships, applying and justifying the use of mathematical routines, designing experiments, analyzing data, and making connections across multiple topics within the course.

**Prerequisites: successful completion of one year of algebra and one year of physics*

NEW! 9th GRADE ACADEMY

Grade 9 Only | PERIOD 1 and PERIOD 2, plus afternoon and evening commitments

Want to make sure you are on track to build the skills you need to succeed for the rigors and expectations of high school? 9th Grade Academy (9GA), offered exclusively to rising 9th graders attending Andover Summer, is a new program designed intentionally to prepare a small cohort of students for the rigors and expectations of high school, while giving them the opportunity to participate in a close-knit, living-learning community.

All students enrolled in 9GA will...

- Enroll in *High School Prep English* and *High School Prep Math* as their two core courses
- Enroll in one section of the Essential Study Skills course to support the development of time-management, working memory, and long-range planning abilities.
- Live together and share a core group of house counselors and advisors during their summer experience.
- Attend 9GA evening classes and supervised study halls together as a group.
- Take part in specially planned Tuesday evening social activities, while integrating into Upper School weekend trips and on-campus offerings.

Understanding the pivotal nature of the transition from middle to high school, the 9GA program ensures that students will leave Andover Summer confident and well-prepared to enter the next phase of their educational journey.

COURSES

Students who select the 9GA option will be automatically enrolled in the following courses:

High School Prep English

This course is designed to provide middle school graduates with a pathway to academic success in their high school English classes, emphasizing academic literacy skills such as close reading, annotation, analytical writing, and presentation. Texts commonly read in the 9th grade curriculum will be utilized to give students an opportunity to get ahead, digging deeply into the structure, organization, word choice, audience, and purpose so that they are prepared to excel when they encounter these texts later in the year.

High School Prep Math

To be successful in high school math classes, students must have a solid foundation of conceptual understanding, fact fluency, and skill application. Reviewing the basics of Algebra I and exposing students to core concepts in Geometry, the High School Prep math course emphasizes problem-solving and mathematical reasoning. Starting with the completion of a baseline assessment that will determine the particular content to be covered during the summer, students will be tasked with regularly monitoring their own learning and collaborating with peers to ensure each student leaves the summer course ready to launch in their particular 9th grade math placements.

Essential Study Skills

This course is designed to teach students the skills to thrive, both academically and personally, in challenging school environments. Invited to nurture the broader dispositions that lead to academic success, students will emerge from the course with a toolkit of strategies they can use throughout their academic careers and beyond for finding and maintaining curiosity and motivation, cultivating optimism and resilience, developing essential academic skills, and applying learning strategies for improved time management and effective study.

****Please note that due to additional programming and cohort activities, students enrolling in the 9GA program will have a \$950 fee added to their tuition bill.**