



## What is ACE?

Launched in 2015, ACE is an innovative, *competency-based program* at Brookline High School for 55 students who choose to be in a smaller educational setting where they can move at their own pace and engage in project-based and experiential learning. ACE provides a rigorous college-preparation pathway in which students are placed in multi-age, honors-levelled classes based on their skill levels and graduate with a Brookline High School diploma when they complete their content and skill competencies. Because the students are in small classes, they benefit from personalized instruction and a tight-knit community of staff and students. Students in ACE are expected to frequently reflect on their personal growth in developing habits of success and actively engage in the ACE community through their participation in their advisory and in community building activities.

## How does ACE work?

ACE students take all of their core academic subjects including English, Math, History and Science in the program while still taking their electives, world language, and health and fitness classes in mainstream. They take two six-week academic classes at a time, averaging three courses in each content area in a given school year. When it is time to assess the student, ACE teachers offer a choice of performance-based assessments that, as much as possible, allow students real-world application of the skills. If a student does not meet a minimum level of competency, “basic competency,” in a class, they do not fail. Instead, they repeat it when it is offered next or take an on-line version of the course, if available. A limited number of ACE online classes are also available for students who want to move at a quicker pace.

Even though many ACE students would otherwise take an AP class, they choose not to because they are seeking a more innovative and experiential classroom experience. If an ACE student is seeking a college class experience, ACE places students in actual college classes through dual-enrollment programs at Roxbury Community College MassBay Community College where they can earn college credit.

In ACE, students also have the option of pursuing internships during school hours for academic credit. This gives students the chance to work with a mentor at a workplace of interest where they do a comprehensive project that is needed by that internship site.

In addition to their academic experiences, ACE students participate in community building trips and community service projects which allow students to build a supportive, trusting environment. ACE also works closely with families to be an active partner in their child’s success. Parents or guardians are expected to come in three times a year to participate in a student-run exhibition on their child’s academic progress.

Acceptance into the program follows an admissions process that includes the student, their family, guidance counselor and the ACE Coordinator. Prospective students must first meet with the ACE Program Coordinator to learn about the program and then schedule a time to sit in on classes to see if it is a good fit. They must also write a short essay to describe why they think the program is the right match for them. Finally, they must schedule an intake interview with their family and the ACE Coordinator.

## What is Competency-Based Education?

In competency-based education, students progress from course to course in each content area, based on their ability to demonstrate mastery in each area, independently and multiple times. They are empowered to have agency over their learning and offered choices about how they create and apply their knowledge and demonstrate their learning. Teachers share rigorous, calibrated expectations for learning (knowledge, skills, and dispositions) and make those expectations explicit, transparent, measurable and transferable. In most competency-based programs, like ACE, students receive timely, differentiated support based on their individual learning needs and they can progress at their own pace within the class. Competency-based educators employ strategies to ensure equity for all students in the culture and structure of their program.

## Other Unique Features of ACE:

**Habits of Success:** Students are taught and held accountable for tracking their growth in 7 key Habits of Success which include: *Goal Setting, Self-regulation, Collaboration, Self-awareness and Reflection, Perseverance, Curiosity, and Community Mindedness*. These are key skills that schools often assume students will learn on their own. In ACE, we feel they are essential for students to learn while they are in high school to be better prepared for college or other post-graduate plans. They are also critical skills for functioning well in our 21<sup>st</sup> Century work world.

**Advisory:** Students are split into small, multi-age advisories which meet twice a week. Advisory is a time for students to have one-on-one academic progress check-ins with their “advisors” (one of the four content teachers), do team-building activities with their peers, and have a “home-base” to talk through any issues of interest and concern from school or in their community.

**Student Leadership and Community Building:** Student voice is integral to how ACE runs. Students have an opportunity to serve on a student leadership team who facilitates regular community meetings. These meetings are a chance for celebrations/awards ceremonies to hosting outside performers to engaging in discussions on topics of interest. The program also involves students in the planning and carrying out of fun, team-building field trips.

## ACE COURSES

It is important that the courses offered in ACE meet the needs of the students in ACE. Each fall, many new students enter ACE to replace those who have graduated. There is no way to anticipate who those students are or what their needs might be. Therefore, it is possible that some new courses not listed here will be created or that listed courses will not be offered.

## ACE COURSE OFFERINGS

### English:

Humanities Seminar Honors
Genre Reading Honors
Novel Concepts Honors
Creative Writing Honors
Informational Writing Honors
Dramatic Literature Honors
Conflict and Characterization in Literature Honors
Thematic Literary Analysis Honors
Literary Criticism Honors
Personal Narratives Honors
Comparative Writing Honors
Literature Analysis Honors
Capstone 2 & 3 Honors

### Math:

Statistics Seminar Honors
Algebra I Honors
Algebra 2A Honors
Algebra 2B Honors
Algebra 2C Honors
Pre-Calculus A Honors
Pre-Calculus B Honors
Pre-Calculus C Honors
Calculus A Honors
Calculus B Honors
Calculus C Honors
Data Analysis and Social Justice A Honors
Data Analysis and Social Justice B Honors
Mathematical Logic & Problem Solving Honors
Advanced Algebra w/ Financial Applications A Honors
Advanced Algebra w/ Financial Applications B Honors

### Dual Enrollment w/ Roxbury Comm. College

Must meet prerequisites set by BHS, ACE, and RCC for the particular course of interest
Must have a minimum GPA of 2.5 or higher

### Dual Enrollment w/ MassBay Community College

Must be an 11 <sup>th</sup> or 12 <sup>th</sup> grader with a 3.0 GPA.
Students may also take 1 course per year for credit in high school or transferable college credit.

### Science:

Cell Biology Honors
Ecosystems Honors
Body Systems Honors
Genetics Honors
Chemical Elements Honors
Population Dynamics Honors
Evolution and Taxonomy Honors
Chemical Reactions Honors
US/World Climate Science and Policy
Advanced Lab in Forensic Science Honors
Biochemistry Honors
Biology of a Pandemic Honors

### Social Studies:

US/World Culture and Society Honors
US/World Decolonization Honors
US/World Revolutions Honors
US/World Capital and Labor Honors
US/World Political Systems Honors
US/World Social Justice Movements Honors
US/World Human Rights Honors
US/World Slavery & Resistance Honors
US/World Climate Science and Policy
Capstone Honors

### Career & Internship Exploration:

Career & Internship Exploration Seminar (CIES)
• Stage 1: Interest Exploration
• Stage 2: Informational Interview
• Stage 3: Job Shadow
• Stage 4: Internship Exploration

### Internships with Comprehensive Academic Projects

6 Week-36 Week Internship with projects that meet needs of internship and address academic content benchmarks. To be determined by supervising ACE teacher and internship mentor.

Must meet prerequisite of CIES Stage 4: Internship Exploration



**EN0720 Humanities Seminar Honors**

What actions should we take to be informed participants in our democratic society? This class is an introduction to the expectations for ACE Humanities courses including metacognition, self-regulation, and competency-based reading, writing, and speaking through the content of media literacy and current events. The course culminates in a presentation and two short responses summarizing each student's individual Theory of Informed Citizenship.

Grade: 10-12

Credit: .33

**EN0820 Comparative Writing Honors**

In this upper-level writing class, students will study the genres of film and literature criticism. Students will view films and analyze the structure and style of film reviews. In the first half of the course the students will practice techniques in a critical essay about a film. Within the essay, students will compare their film to others within the film genre. Additionally, each student will read a novel. By the end of the course, each student will write a critical review of their selected novel and post it to Good Reads.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

**EN0020 Genre Reading Honors**

This introductory reading class is designed to support comprehension, analysis, and appreciation of the genre of poetry. In the course, students will read, analyze, discuss, and write about poems. In the first half of the course, students will choose a poem to study and write an analytical essay about one or more of its features. In the second half of the course students will create a short video, similar in style and structure to the Favorite Poem Project. The video will explore the student's text-to-self connection to the poem.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

**EN0520 Creative Writing Honors**

This writing class helps students produce works of short fiction and poetry. In the opening weeks of the course students will study short stories and identify the techniques authors use to tell their stories. Students will examine narrative structures as well as elements of style before putting their understanding to work on their own stories. In the second half of the course students will shift to examining poetry. Each student will write and perform an original poem.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

**EN0620 Informational Writing Honors**

In an increasingly technological society, students need to be comfortable navigating and utilizing the vast tools and communities the internet affords us. This class is designed to introduce students to basic research and technology skills, in addition to writing skills, by creating personal blogs focused on student-selected topics. Students will conduct research, taking notes and creating citations for their sources along the way. They will outline and draft posts, utilizing rubrics to self and peer edit. After gaining teacher-approval that the post's content and grammar is of publishable quality, students are taught how to format their writing on their blog's website, using sites such as WordPress, Wix, and Weebly. These basic skills are the foundation of modern independent businesses as well as journalism, giving students an authentic experience in potential career paths while strengthening outlining, drafting, and editing skills.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

**EN0220 Novel Concepts Honors**

In Novel Concepts, students will read novels in literature circles. Not only will students learn how key literary elements manifest in a novel-length text, but they will also reflect on their ability to sustain silent reading, using strategies to become aware of their challenges and ultimately improve their reading skills. Students are given time in class to practice reading strategies, but are expected to continue reading outside of class. The class culminates with an analytical paper, group project, or creative project that draws upon the conclusions of the analysis.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

### **EN1820 Dramatic Literature Honors**

In this course, students will read plays from August Wilson's Century Cycle, which included works such as *Ma Rainey's Black Bottom* and *Jitney*. The class will read the plays together as each student begins to focus on a particular character. Students will write an analytical essay about the character. Then they will select one of that character's monologues, analyze it, memorize it, rehearse it, and perform it publicly. This course will prepare interested students for competition in the school and regional levels of the National August Wilson Monologue Competition.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

### **EN0420 Thematic Literary Analysis Honors**

In this course, students will analyze works across multiple genres and media. The class will select a theme that will give focus to their reading and analysis. Each student will join a book group and read a novel or memoir that explores the class theme. Additionally, students will read shorter, thematically connected works during class sessions. Throughout the course, students will study podcasting and create their own outline of an ACE Literature Podcast episode. As the students read their books, they will practice podcasting. In the final week of the course each group will record its episode for publishing on the ACE English website.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

### **EN0320 Conflict and Characterization in Literature Honors**

This upper-level reading class focuses on the elements of conflict and characterization in literature. Each student will join a book group and read a novel. The students will study the conflicts within the novel and write an analytical paper on one of the conflicts. Students will also study how the author uses style to develop characterization. The final assignment will be a creative writing piece that incorporates the elements of style that students study in their book groups.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

### **EN1120 Personal Narratives Honors**

This course is designed for graduating students to reflect upon their lives and their futures post-high school through creative nonfiction writing. The final product is an essay that can be used for college applications. Students read personal narrative examples ranging from NPR's *This I Believe* essays to previously graduated BHS students' college essays. A core tenant of the class is frequent peer feedback sessions and self-reflective practices. This class gives students space to practice the project-management and independence that they will need for college.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

### **EN1520 Literary Criticism Honors**

In this course, students will study social justice-oriented literary theories. Each student will join a book group and read a novel or memoir. Students will study the work through the lenses of Feminist Theory, Critical Race Theory, and/or Marxist theory. Additionally, students will read shorter works during class sessions. Throughout the course, students will study podcasting and create their own outline of an ACE Literature Podcast episode. As the students read their books, they will practice podcasting. In the final week of the course each group will record its episode for publishing on the ACE English website.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33

### **EN1920 Literature Analysis Honors**

This online course is designed to support students in furthering their appreciation for reading. The curriculum guides students in identifying the genres, authors, and subjects that interest them the most. Students will make use of the resources of the BHS Library to choose a book to read and analyze on their own. Working with the teacher, students will create a reading calendar and set up weekly meetings with the teacher to discuss the book and progress in the course. Students will complete reading journals to help them track plot, character development, and other literary elements. Students will work with the teacher to create a project in support of a community of readers. Finally, they will write an analytical essay about the book.

Grade: 10-12

Prerequisite: Humanities Seminar

Credit: .33



**EN1320 Capstone 2 Honors****EN1420 Capstone 3 Honors**

These are the 2nd and 3rd Capstone courses that all ACE students must complete in order to graduate. In EN1320, students use the extensive research that they completed in their first Capstone class (SO1320) to then outline, draft, and edit a 10-page paper that details their research findings. This paper must take a position on the issue that they chose and write a thorough argument to support their position, citing facts from their research and citing them in a detailed bibliography that follows standard MLA format. Students must submit multiple drafts for teacher and peer feedback to craft a college-level paper. In EN1420, students carry out and document their "legacy" projects such as leading workshops in elementary schools, attending protests against gentrification, volunteering at food banks and soup kitchens, and more. The course then culminates in a public Capstone presentation to their family and peers which includes a powerpoint presentation capturing their major research findings and chronicling their legacy project work.

Grade: 10-12

Prerequisite: Humanities Seminar &amp; Capstone 1

Credit: .33

**ACE Mathematics**

The ACE Math Course Sequence focuses on the development of competence in algebraic concepts through an exploratory approach that incorporates project-based and student-centered learning. ACE courses are derived from traditional high school math courses: the topics that would be covered in a year-long class are split into three separate modules each of which is worth a third of a credit. Some courses may be taken out of sequence as long as their individual prerequisites are met. Students must demonstrate competence on benchmark skills identified for each course - this competence is the basis of the credit and grade determination.

**MA0920 Statistics Seminar Honors**

All students entering ACE take a pair of seminar courses which serve to introduce students to competency-based education and the ACE program. The statistics seminar is meant to prepare students to interpret and analyze statistical information in future math and science courses. Topics covered include measures of central tendency, direct and indirect variation, rates, percentages and other foundational measures, as well as probability and distribution.

Grade: 10-12

Credit: .33

**MA0420 Algebra 1 Honors**

An exploration of linear functions focused primarily on algebraic and graphical representations. Students will construct and solve systems of linear equations and linear inequalities and then will explore linear programming and other applications from economics through the central projects in the course.

Grade: 10-12

Prerequisite: Statistics Seminar

Credit: .33

**MA0120 Algebra 2A Honors**

An exploration of functions in which students develop an analytic framework for making use of structure when working with transformations, combinations, compositions, and inverses of functions. Students also explore rates of change and develop fluency in function notation, literal equations, and the analysis of key features across multiple parent functions.

Grade: 10-12

Prerequisite: Statistics Seminar &amp; Algebra 1

Credit: .33

**MA0220 Algebra 2B Honors**

An exploration of quadratic functions focused primarily on algebraic and graphical representations. Students will apply algebraic techniques to quadratic expressions to reveal key features of their corresponding graphs. Students will use technology to model phenomena in the real world with quadratic functions through the central projects in the course.

Grade: 10-12

Prerequisite: Statistics Seminar &amp; Algebra 2A

Credit: .33



**MA0320 Algebra 2C Honors**

An exploration of exponential and logarithmic functions focused primarily on algebraic and graphical representations. Students will apply algebraic techniques to exponential and logarithmic expressions to reveal key features of their corresponding graphs. Students will develop an understanding of the properties of exponents and logarithms and will explore various financial and scientific mechanisms (compound interest, annuities, radiometric dating, population modeling, etc.) through the central projects in the course.

Grade: 10-12                      Prerequisite: Statistics Seminar & Algebra 2B                      Credit: .33

**MA0820 Precalculus A Honors**

An exploration of polynomial and rational functions focused primarily on algebraic and graphical representations. Topics include: synthetic division, the remainder theorem, the rational roots theorem, and the fundamental theorem of algebra. Students will examine the use of polynomials in graphics, animation, and design through the central projects of the course.

Grade: 10-12                      Prerequisite: Statistics Seminar & Algebra 2C                      Credit: .33

**MA0520 Precalculus B Honors**

An exploration of right-triangle, oblique-triangle, and unit-circle trigonometry. Students will examine the use of triangle-trigonometry in surveying and navigation, and will also apply sinusoidal models to observable phenomena drawn from different fields. Through the central projects in the course, the students will also have the opportunity to develop an understanding of the use of parametric functions.

Grade: 10-12                      Prerequisite: Statistics Seminar & PreCalc A                      Credit: .33

**MA0620 Precalculus C Honors**

Students will use technology to model datasets and related quantities drawn from various fields; through critique and examination of these models, students will continue to develop their understanding of the behavior of elementary functions. Students will use regression and linearization techniques to develop a framework for calculus and will explore preliminary calculus concepts including: sequences and series, limits, and rates of change.

Grade: 10-12                      Prerequisite: Statistics Seminar & PreCalc A & PreCalc B                      Credit: .33

**MA1220 Calculus A Honors**

An exploration of continuity, limits, and derivatives. Students will develop methods of differentiation for polynomial, radical, and rational functions. Students will examine the derivatives of exponential and trigonometric functions through experimentation with graphical representations using technology.

Grade: 10-12                      Prerequisite: Statistics Seminar & PreCalc C                      Credit: .33

**MA1320 Calculus B Honors**

An exploration of integrals. Students will develop methods of integration for polynomial, radical, and rational functions. Students will examine the integrals of exponential and trigonometric functions through experimentation with graphical representations using technology.

Grade: 10-12                      Prerequisite: Statistics Seminar & Calc A                      Credit: .33

**MA1420 Calculus C Honors**

An exploration of the applications of derivatives and integrals. Students will also develop additional techniques for differentiation and integration of composite functions. Students who complete Calculus A, B, and C will be prepared for success in college Calculus courses.

Grade: 10-12                      Prerequisite: Statistics Seminar & Calc B                      Credit: .33



### **MA1720 Mathematical Logic & Problem Solving Honors**

An exploration of topology that includes a study of knot theory and logic. Students will apply techniques of reasoning both abstractly and quantitatively in order to describe and model physical mathematical phenomena. Through the central projects of the course, students will develop an understanding of the properties of topology, applications of knot theory, polyrhythms in music, and the application of mathematical logic to real world situations.

Grade: 10-12

Prerequisite: Statistics Seminar, Algebra 1

Credit: .33

### **MA1620 Data Analysis for Social Justice A Honors**

The course addresses key knowledge areas in data science including data collection, data cleaning, data privacy, modeling, tools for data analysis, and data visualization. In each module of the course, case studies will be explored that are related to social justice issues. In this way, students will see how data science can be used to gain a better understanding of inequities and the success of interventions employed to disrupt them. Students will develop proficiency with technologies such as spreadsheets, tools for converting file types, CODAP, and Google Platform (sheets, slides, and Colab with Python).

Grade: 10-12

Prerequisite: Statistics Seminar

Credit: .33



### **MA2130 Data Analysis for Social Justice B Honors**

The course builds on key knowledge areas in data science including data collection, data cleaning, data privacy, modeling, tools for data analysis, and data visualization. In each module of the course, case studies will be explored that are related to social justice issues. In this way, students will see how data science can be used to gain a better understanding of inequities and the success of interventions employed to interrupt them. Students will increase their proficiency with technologies such as spreadsheets, tools for converting file types, CODAP, google Platform (sheets, slides and Colab with Python), Tableau, and Stapplet.

Grades: 10-12

Prerequisite: Statistics Seminar and Data Analysis for Social Justice A

Credit: .33



### **MA1820 Advanced Algebra with Financial Applications A Honors**

An application of mathematics to the analysis of monetary policy (including budgeting and taxation), investment strategies, entrepreneurship and venture capital, actuarial science, and personal finance. Presuming facility with radical, quadratic, exponential and logarithmic equations as well as regression techniques, the central projects of the course require students to critique the strategies or reasoning of others, to apply advanced algebra to real world scenarios using technology, and to represent their thinking both algebraically and graphically.

Grade: 10-12

Prerequisite: Statistics Seminar, Algebra 1, Algebra 2C

Credit: .33

### **MA2820 Advanced Algebra with Financial Applications B Honors**

An application to an in-depth analysis of a student-selected topic in one of the following areas: monetary policy and its impacts on particular sectors of the economy; investment strategies and a case study of their effects over time and in particular contexts; a case study in an area of entrepreneurship; analysis of a particular policy decision (prescription drug costs, insurance regulation, tariffs in particular industries) and its macro and micro monetary effects; further investigation into the wealth gap in the United States and an evaluation of the proposed remediations.

Grade: 10-12

Prerequisite: Advanced Algebra with Financial Applications A

Credit: .33

## **ACE Science**

### **SC0520 Ecosystems Honors**

Students will identify biotic and abiotic factors in an ecosystem, and characterize ecosystems into the various biomes represented across the world by researching and presenting a poster on the ecosystems of various locations around the world, taking the class on a “Biome Safari.” In the next unit students relate traditional food and culture to the ecosystem that birthed it by drawing connections between producers, consumers, and decomposers in a food web, and explaining how energy is transferred through photosynthesis and respiration. Students will build a model to show this transfer of energy through the trophic levels of an ecosystem, before analyzing a trophic cascade relating to an invasive or extinct species.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33



### **SC0720 Population Dynamics Honors**

In this course, students will understand how survival of the biotic parts of an ecosystem depends on the abiotic components by explaining the cycling of water in an ecosystem, describing the importance of natural resources for human society and categorizing them as renewable or limited. Students then analyze how humans impact an ecosystem through resource consumption and habitat destruction by doing a case study on an endangered species. Students then use computer modeling to investigate the relationships between population size, carrying capacity, and competition, and then recommend ways to reduce the level of human impact on the environment through a social action oriented sustainability campaign.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

### **SC4580 US/World Climate Science and Policy**

This interdisciplinary class (for science and social studies credit) focuses on the science behind the causes and solutions of climate change, and the economic and social impact of looming climate disaster. Students will model the Carbon Cycle, investigate human impact on climate change, and design their own experiment to evaluate ways to reduce this impact that they will then elucidate in a college level lab report. Students will also research the economic, social, and political implications of the climate crisis, identifying and advocating for policy shifts to mitigate climate change and its effects.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

### **SC0120 Cell Biology Honors**

This introductory biology course first asks students to define the characteristics of life and use them to evaluate the presence of life in a mock trial. Students then build physical 3D models or write analogies illustrating how the parts of the cell work together to perform life's functions, before classifying cells as prokaryotic, eukaryotic, plant, animal, bacterial, protistic, or viral. The final unit emphasizes the importance of osmosis, diffusion, and the selective permeability mechanisms of the cell membrane in a lab using dialysis tubing and various solutions.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

### **SC0420 Genetics Honors**

Students will explain how the subunits of DNA determine its structure and function and model the parts and processes of RNA transcription and translation in a series of quizzes requiring students to build Lego DNA strands. Next students will relate superhero origin stories to explain how mutations in a DNA sequence may occur and classify mutations according to their effect. A unit on the basis of genetic variation debunks race as a genetic construct, and then illustrates how meiosis in sexual reproduction results in genetic variation. Students then research Gregor Mendel's experiments and use punnett squares to predict the possible genotypic and phenotypic ratios resulting from a genetic cross, and compare and contrast complete, incomplete, and codominance, polygenetic traits, and multiple alleles. Finally, students analyze the benefits and risks associated with stem cells, cloning, or genetically modified foods in a research poster project.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

### **SC0220 Body Systems Honors**

This biology class first requires students to describe the levels of specialization within multicellular organisms, then identify the structure and function of the major human organ systems. Students then investigate homeostasis using a frog dissection, and write a summary or give a presentation explaining how homeostasis maintains an optimal internal environment for the functioning of body systems. Students will then apply knowledge of the reproductive system to sexual health by developing informational pamphlets for teens. The final project asks students to explain how the respiratory and circulatory systems cooperate to exchange oxygen and carbon dioxide and apply knowledge of the muscular, nervous, and skeletal systems to exercise in an integrated research project on the exercise physiology of a particular athletic activity of the student's choice.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

### **SC0020 Evolution and Taxonomy Honors**

Students learn to identify the characteristics and give examples of the major taxonomic kingdoms and describe how life is classified from broader into more specific categories by illustrating a calendar that proportionally shows all of geologic time. Students then apply the current taxonomic system to classify organisms in a scavenger hunt involving a trip to the Harvard Natural History Museum. Students then use a series of game simulations to learn about evolution, and are able to explain how populations adapt to their environment through natural selection and distinguish between and give examples of natural, artificial, and sexual selection. Finally, students describe pre-Darwinian ideas about the origin and unchanging nature of life on earth and explain how Darwin's observations led to the development of the theory of evolution, evaluating evidence for the theory of evolution in a mock trial where they are lawyers defending Charles Darwin in court.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33

### **SC1720 Chemical Elements Honors**

Students first distinguish between physical and chemical changes of matter in an investigatory lab activity. Students then learn to describe and classify the characteristics of matter by defining and differentiating between elements, compounds and mixtures, and describing the states of matter in terms of energy, particle motion, and physical properties. Students use atomic models to better understand the structure of an atom by describing the development of modern atomic theory, and identifying the major components of the atom and how they interact. Students then analyze trends on the Periodic Table including electron configurations and the placement of families of metals, non-metals, and metalloids by adopting and characterizing an element into a costume or cartoon character. These characters and the properties of the elements they represent are then presented and pitted against each other in role play "battles" versus each other where students develop knowledge of chemical and physical properties into attacks and defenses. Finally, students describe how elements form bonds and compounds, naming chemical formulas and classifying ionic and molecular compounds.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33

### **SC0820 Chemical Reactions Honors**

In the first unit, students learn how to represent conservation of mass during chemical changes using chemical equations and appropriate calculations. This unit asks them to apply the law of conservation of mass to balance chemical equations, use the concept of moles to convert mass, moles, and number of particles, and calculate the mass of one part of a chemical equation when given the mass of another part. Students will then classify the different types of chemical reactions including endothermic vs. exothermic, single vs. double displacement, synthesis vs. decomposition, and combustion. The final unit is on solutions. Students first describe the concentration of a solution in terms of molarity, and characterize acid vs. base vs. salt solutions, then use the pH scale to characterize acid and base solutions and apply knowledge of acid-base neutralization to perform a titration of an acid of unknown molarity.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33

### **SC1420 Biochemistry Honors**

First, students must explain the structures and function of the digestive system. From there, students identify, illustrate, and summarize the function of the major nutrients, and give examples of foods that contain high amounts of particular nutrients. Once this basic biochemistry is understood, students are ready to describe the relative amounts and combination of nutrients that constitute homeostasis in the human body, and test a common food to quantify the relative and absolute amount of a nutrient that it contains. Each student analyzes a different food available at the school and performs a series of four labs to test its sugar, lipid, starch, and protein content, then must synthesize the nutrient data from other students' experiments to recommend constituents of a balanced diet in a ten page lab report.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33



### **SC1620 Advanced Lab in Forensic Science Honors**

Students first understand the scientific basis of criminal investigation by relating the parts of the scientific method to the criminal investigation process, and giving examples of types of evidence that may be analyzed. Students then learn to describe and implement methods of identifying victims and suspects of a crime including applying knowledge of fly larvae development to determine time of death, classifying an unknown fingerprint, matching patterns to determine the identity of a DNA sequence, and analyzing blood spatter to infer location and type of weapon used. The final project requires students to synthesize all that they have learned to construct a plausible scenario and sequence of criminal events based on crime scene evidence, and present how they would solve the case using forensic techniques.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

### **SC1820 Biology of a Pandemic Honors**

This course explores the virology, epidemiology, and public health response to the COVID-19 pandemic. First, students explain how the specialized structures of the immune system work together to fight disease with special attention to the immunological mechanism of vaccination. Next, students describe factors pertinent to the virology, epidemiology, and medical interventions being used to combat COVID-19. The last unit asks students to evaluate the effectiveness of public health measures being used to combat the pandemic.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

## **ACE Social Studies**

### **SO1520 US/World Revolutions Honors**

Why do people revolt? What allows a revolution to be successful? Students will explore the context, causes, strategies, and factors (stakeholders, key events, etc...) that lead to the success or failure of a revolution. They will focus on finding the common and divergent factors between the American Revolution and global revolutions (i.e. Russia, Iran, Haiti, France, or Cuba). The class culminates in a project of the student's choice which showcases their individual Theory of Revolution.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

### **SO0220 US/World Political Systems Honors**

What are the essential preconditions for effective democracy? In this class, students will do a comparative analysis of US and global governmental structures and principles through case studies (i.e. Indonesia, the Philippines, Turkey, Ukraine, South Africa, the United Kingdom, Uruguay, etc..) The class culminates with students designing a government based on their own Theory of Democracy.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

### **SO1620 US/World Slavery & Resistance Honors**

Are Black People free? This class is an analysis of slavery and freedom through the US Civil War and Reconstruction including the continued repercussions of slavery and resistance to date in the US and around the world (i.e. Mass Incarceration, Black Lives Matter, Effects on West Africa, etc...). The class culminates in an Anti-Racist Action Plan which actualizes a part of each student's Theory of Liberation.

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33

### **SO1220 US/World Decolonization Honors**

How do we decolonize our realities? This class is a comparative analysis of methods used to resist European and US Imperialism including the motivation, strategies, impacts, and resistance to imperialism within the specific contexts of the Americas, Africa, and Asia (i.e. British Colonial India, The Opium Wars, Scramble for Africa, French Colonial Indochina, US expansion and intervention in Latin America). The class culminates in an argumentative and document-based essay applying students' individual Theory of Decolonization

Grade: 10-12                      Prerequisite: Humanities Seminar & Statistics Seminar                      Credit: .33



### **SO0320 US/World Social Justice Movements Honors**

What is the best way for oppressed peoples to leverage their power in order to achieve social and political change? In this class, students will explore historic and contemporary social and political movements for change focusing on the most effective means by which oppressed peoples can challenge the tyranny of an empowered elite (i.e. Civil Rights Movement, Gandhi, Serbian Revolution, etc...) The class will culminate in an argumentative essay detailing each student's Theory of Change.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33

### **SO1120 US/World Human Rights Honors**

How should we respond to genocide? In this class, students will do an analysis of genocide including historical antecedents, international organizations, and US responses based on an understanding of the Holocaust and an application of the ideals in the UN Declaration of Human Rights and the Genocide Convention (i.e. Armenia, Cambodia, Bosnia, Rwanda, and the Sudan). This will include a recommendation both for US and International policy and for individual action. The class will culminate in a formal debate with students crafting a concluding resolution based on their Theory of Response.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33

### **SO2220 US/World Culture and Society Honors**

How do we recognize and dismantle systems of privilege and oppression? This class is an introduction to recognizing, navigating, and dismantling systems of privilege and power (i.e. color, gender, ethnicity, sexual orientation, ability, and class) using a US Civil Rights Movement (i.e. The US Disability Rights Movement) and two global movements for change as case studies (i.e. Women in India, Colorism in Latin America, Religion in China, etc...). The class will culminate in a mini advocacy project in which students will apply their own Theory of Equity.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33

### **SO1920 US/World Capital and Labor Honors**

Which economic system offers the best balance of economic freedom and equity? This class is an introduction to the economic philosophies behind Capitalism, Socialism and Communism using primary source documents (eg. Smith's "Wealth of Nations", Carnegie's "Gospel of Wealth", Marx' "Communist Manifesto") and actual global events (eg The Industrial Revolution, Gilded Age, Russian Revolution, Cuban or Cultural Revolution) to question the application and practicality of idealized economic systems. This class will culminate in students writing their own individual economic manifestos based on their evolving understandings.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33

### **SO4580 US/World Climate Science and Policy**

This interdisciplinary class (for science and social studies credit) focuses on the science behind the causes and solutions of climate change, and the economic and social impact of looming climate disaster. Students will model the Carbon Cycle, investigate human impact on climate change, and design their own experiment to evaluate ways to reduce this impact that they will then elucidate in a college level lab report. Students will also research the economic, social, and political implications of the climate crisis, identifying and advocating for policy shifts to mitigate climate change and its effects.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33

### **SO1320 Capstone Honors**

All students who graduate from ACE must successfully complete the Capstone series of 3 consecutive six-week classes. This first six-week class, SO1320 is Part One of this Action Research Project which culminates in a college level research paper. The class is a practicum on research methodology including both original research and research review (i.e. creating strong research questions, reading scientific articles and studies, creating an annotated bibliography, writing a literature review and an abstract and determining implications of their research).

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33



**Career and Internship Exploration Seminar (CIES)**

Career and Internship Exploration Seminar is a trimester seminar broken down into four stages: 1). Interest Exploration 2). Career Path Informational Interviews 3). Job Shadows 4). Internship. Students may opt to take the seminar for one trimester or more, depending on how many stages of the seminar they hope to complete.

Grade: 10-12

Prerequisite: Humanities Seminar & Statistics Seminar

Credit: .33